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SULIIN, SHEILA MILLER HUTCHENS
COMPARISONS OF PERFORMANCE ON THE "LUSCHER
SHORT COLOR TEST" AMONG LEARNING DISABLED,
PREDELINQUENT, AND REGULAR ADOLESCENTS IN
GRADES EIGHT, NINE, AND TEN.

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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

COMPARISONS OF PERFORMANCE ON THE LUSCHER SHORT COLOR TEST
AMONG LEARNING DISABLED, PREDELINQUENT, AND REGULAR
ADOLESCENTS IN GRADES EIGHT, NINE, AND TEN

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF EDUCATION

BY

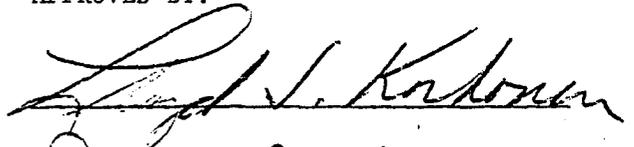
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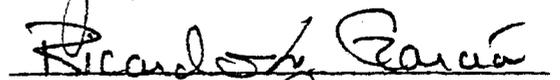
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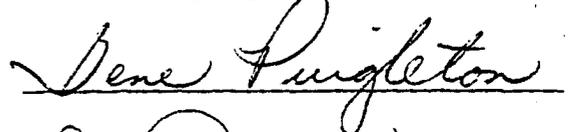
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APPROVED BY:











DISSERTATION COMMITTEE

COMPARISONS OF PERFORMANCE ON THE LUSCHER SHORT COLOR TEST
AMONG LEARNING DISABLED, PREDELINQUENT, AND REGULAR
ADOLESCENTS IN GRADES EIGHT, NINE, AND TEN

BY: SHEILA MILLER HUTCHENS SULIIN

MAJOR PROFESSOR: LLOYD J. KORHONEN

A study was conducted to compare the performance of learning disabled, predelinquent and regular eighth, ninth and tenth grade adolescents on the Luscher Short Color Test as measured by (a) the Luscher interpretation manual and; (b) the author's quantitative scoring scale. The results indicated that the Luscher Short Color Test differential between regular subjects and learning disabled or predelinquent subjects as indicated by both scoring methods.

The child is eternal, and so are toys
and tears and laughter. When the house
is put in order by strange men, when the
clothes that were worn and the tools that
were used are put away, there will be found
an upper room full of toys. These remain.

A. Lincoln

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DEDICATED TO SUSAN AND OTHERS WHO SHARE HER PLIGHT
AND THE ONE "TO GENTLE TO LIVE AMONG WOLVES"

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CHAPTER I

INTRODUCTION

The decade between 1968 and 1978 has been a controversial time within exceptional learner education concerning learning disabled (LD) and behaviorally disordered (BD) adolescents. Some authorities believed that these categories were symptomologically within the same population (Clements, 1964; Compton, 1974; Cummings, 1944; Peters, 1974, Note 1; Poremba, 1974, Note 2). Other authorities concluded that these groups were differentiated populations (Critchley, 1968; Flew, 1973; Murray, 1976; Quay and Werry, 1972).

The controversy between LD and BD symptomology aroused considerable interest concerning the relationship between adjudicated adolescents and learning disorders. (Berman, 1974; Murray, 1976; Poremba, 1974). Poremba (1974) stated that 90% of all currently adjudicated children in Colorado, exhibited mild to severe learning and behavioral disabilities. Berman (1974) identified 96% of Rhode Island's adjudicated adolescents as learning disabled and/or behaviorally impaired. Suliin (1974, Note 1) found 98% of all adjudicated girls in one Arkansas facility exhibited learning disorders, varying in degree from mild to severe with primary causes ranging from learning disabilities and behavioral disorders to parental-societal neglect. Research funded by the U.S. Department of Justice (Murray, 1976) found evidence contradictory to most earlier research, concluding subjects were

so complex that learning disabilities could not be specifically isolated as causal to juvenile delinquency.

Proponents of the learning disabilities/juvenile delinquency relationship cited ex post facto similarities between functional, cognitive and conative characteristics of both groups (Compton, 1974; Berman, 1974, Note 3; Hursch, 1974, Note 4; Note 1; Poremba, 1974, Note 2). Opponents cited the lack of empirical evidence to support a causal relationship, yet they admitted a suggestive relationship (Critchley, 1968; Murray, 1976).

Murray (1976) surveyed the research evidence presented by the opposing faction. He concluded that available quantitative evidence was less than that necessary to "provide empirical proof" of a causal relationship (p. 65). Murray further stated that previous "quantitative research was poorly planned, designed and presented," only a suggestive link between learning disabled adolescents and subsequent adolescent delinquent behavior was reported (p. 65).

The first objective of this study was to review the literature relevant to: (a) delinquent adolescents and (b) learning disabled adolescents, to determine whether a common variable could be identified and a study designed to compare within these groups this variable. The review of related literature demonstrated two characteristics common to adolescents of both groups: (a) academic dysfunction; and (b) personality deviance (Cohen and Short, 1958; Conger and Miller, 1966; Glueck and Glueck, 1950, 1959; Klar, 1966; Tarnapol, 1970; Rhodes, 1972; Berman, Note 4; Peters, Note 2; Poremba, Note 3). The measured variable for this study was personality deviance.

Personality configurations evolve relative to essential individual differences in perceptual thresholds. Thresholds of perception are

different within each individual due to the locus from which they perceive their experiences (Jung, 1927, 1976; Malone, 1977). Adolescents who manifest learning deficits, behavioral or social maladjustment, exhibit severe disparities within their personality configurations, resulting in intrapersonal conflicts and anxieties (Luscher, 1949, cited in Scott, 1969; Klar, 1966; Berman, Note 3).

Differences in personality configuration determine the manner in which an individual's interactions with others are communicated, received and interpreted. Personality configurations reflect the way an individual has perceived prior experiences. Disparities in personality patterns are heightened by the physiological stresses of puberty (Conger and Miller, 1966). For adolescents exhibiting maladaptive or disparate behaviors, puberty accents existing maladjusted behaviors, reducing already deficit coping skills (Conger and Miller, 1966; Berman, Note 4). Within the school setting, disturbed or learning disabled youth populations are highly vulnerable groups (Berman, Note 4). It is within the school setting that most troubled youth are identified as learning disabled, socially maladjusted or behaviorally disordered (Cantrell and Cantrell, 1974; Laten and Katz, 1975; Prieto and Rutherford, 1977).

Previous attempts at identification of delinquency prone adolescents have been ex post facto, etiologic and multivariate in approach (Hathaway and Monachesi, 1954; Murray, 1976). Are there personality trait configurations which would differentiate adolescents exhibiting learning and behavioral dysfunctions from the "normal" adolescent populations? Would a quickly administered, projective test differentiate between these populations prior to the overt commission of delinquent acts? It was the second objective of this study to determine whether the Luscher Short

Color Test (LSCT) would differentiate between high school students attending differentiated education programs.

Statement of the Problem

The problem was twofold: (a) to determine whether learning disabled and/or predelinquent adolescents exhibited similar or different personality configurations in performance on the LSCT. (b) Would quantitative scoring of the LSCT enhance the differentiation between selected groups of adolescents? Specifically, this study investigated the following questions:

1. Will the LSCT identify different personality configurations among adolescents in the 8th, 9th and 10th grades attending regular classes and those attending a learning disabilities class?
2. Will the LSCT significantly differentiate between personality configurations exhibited by learning disabled adolescents in the 8th, 9th and 10th grades and predelinquent adolescents attending alternative education programs within their home community?
3. Will the LSCT differentiate between personality configurations exhibited by adolescents in the 8th, 9th and 10th grades attending regular classes and predelinquent adolescents attending alternative education programs?
4. Will a weighted numerical scoring scale, contingent upon specific color positions as indicated by the interpretation manual of the LSCT, differentiate more specifically personality configurations among selected adolescent groups?

Three major assertions were promulgated in this study: (a) individuals who exhibited observable deviant behavior and/or learning dysfunctions demonstrated different personality configurations than nondeviant individuals (Conger and Miller, 1966; Naylor, 1972; Quay, 1965). (b) Ranked color preferences may be employed as predictors of behavior (Beck, 1947; Schaie, 1966; Scott, 1969). (c) Standardization of color

preference responses employing a numerical scale would yield measurable differences in personality trait problems among selected groups of adolescents (Cronbach, 1948; Schaie, 1966).

Specific Hypotheses

The following hypotheses were tested in this study:

H₁ There is no significant difference among color choices for students attending eighth, ninth, and tenth grade regular classes when ranked color preferences between grades are compared.

H₂ There is no significant difference among color choices for learning disabled students attending eighth, ninth, and tenth grade learning disability resource classes when ranked color preferences between grades are compared.

H₃ There is no significant difference among color choices for predelinquent adolescents attending eighth, ninth, and tenth grade alternative education programs when ranked color preferences are compared between grades.

H₄ There is no significant difference among color choices for regular, learning disabled, and predelinquent adolescents attending education programs in their home community when ranked color preferences are compared.

H₅ There is no significant difference among numerical scores as measured by the investigators scale between regular, learning disabled, and predelinquent adolescents attending education programs within their home communities.

Purpose and Significance of the Study

The purpose of this study was to determine whether predelinquents can be differentiated from regular subjects by their personality configurations as indicated by an easily administered projective test. Differentiation of predelinquents from nondelinquents at an earlier age would facilitate intervention and rehabilitation of delinquency prone youths.

The LSCT has been the focal point of several research studies with disparate results. Some studies have indicated the test's reliability to

differentiate between selected groups (Carney, 1970; Johnson, 1972; Klar, 1966; Scott, 1969), while other studies have reported inconsistent reliability for this instrument (Sproles, 1973). This study would add to the existing body of knowledge relative to the use of the L SCT for early identification of delinquency prone youths.

Limitations of the Study

Limitations of the present study were determined by restraints inherent to the nature of this study. The first limitation of the study was the scope of the sample; three grade levels and three educational groups were tested. A second limitation was demographic; all subjects lived in the southwestern United States and were ostensibly Caucasian (95%). A third limitation was the legal restraint requiring parental consent prior to any study which involved psychological testing in the public schools. Generalizability of the data results beyond these samples will be viable only if the populations are equitable.

Operational Definition of Terms

The following operational definitions of terms are employed in this study:

Learning disabled (LD): Subjects previously diagnosed as learning disabled by a psychologist or psychometrist.

Learning disabilities resource room: Learning disabilities resource room shall indicate a classroom taught by a teacher certified in learning disabilities. This classroom will not be self-contained; subjects will attend the class a maximum of three hours per day.

Predelinquent: Subjects who have been charged by the juvenile courts with three or more status offenses and have been expelled from or have dropped out of regular education programs.

Delinquent: A subject who has committed repeated acts: (a) which when committed by adults are punishable by law as either misdemeanors or felonies; or (b) which are considered by judicial agencies to be status offenses (Glueck, 1950).

Status offenses: Those non-criminal behaviors for which minors may be charged which are not illegal acts if committed by adults: truancy, running away, possession of an alcoholic beverage, curfew, etc. (NIJJDP, Note 16).

Alternative school: A certified school program designed to meet the academic and emotional needs of predelinquent students unable to attend regular education programs.

Home community: The community in which the adolescent resides with his/her family.

Regular classroom: A classroom in which: (a) academic curriculum and teaching techniques employed are considered to be regular procedures commensurate with grade and age levels of the students; (b) students are achieving at or above grade level.

Socially maladjusted: Individuals who exhibit interaction behaviors which are deemed harmful to himself/herself or others and in need of amelioration (Hewitt and Jenkins, 1946, p. 14).

Emotionally disturbed/behaviorally disordered (BD): An individual exhibiting exaggerated and severe patterns of deviant behavior in which the primary cause is believed to be previous emotional trauma: neglect, abuse, abandonment, poor maternal or family bonding (Rhodes, 1978, 1970; West, 1975).

Personality configuration: The individual configuration of behaviors predicated by the integration of personality traits; a

configuration is not obtainable by simple addition of the parts (Catell, 1957, p. 370).

Personality trait cluster: The integration of two or more personality traits forming reactions based upon the individual's perception of previous related experiences (Malone, 1977).

Function group: The Luscher interpretation given each color group as indicated by the group's position according to the individual's preference. Luscher defined five function groups: (a) (+) desired objective; (b) (X) the existing situation; (c) (=) characteristics under restraint or inappropriate to situation; (d) (-) rejected or suppressed characteristics; and (e) (+-) the actual problem resulting from stress (Scott, 1969).

Chapter I has presented an introduction, statement of the problem, purpose, terms to be employed and specific hypotheses to be tested during this investigation. Chapter II presents a review of the literature relevant to this investigation.

CHAPTER II

SURVEY OF RELATED LITERATURE

A broad review of delinquency literature was undertaken in an attempt to isolate common trends and to define areas of focus. Thereafter, a more narrow review of literature focused upon research relating delinquent behavior and concomitant learning and/or behavioral disorders among adolescents. The most commonly found trend in delinquency and LD/BD literature was the concept that these disorders were deviant forms of learning and/or behavior patterns exhibited either academically and/or behaviorally, affecting the Gestalt development of the individual (Clinard, 1974; Cohen, 1966; Compton, 1974; Glueck and Glueck, 1950; Levy, 1974; Poremba, 1972; Quay and Werry, 1972; Rhodes and Tracy, 1974; Berman, 1974, Note 3; Poremba, 1974, Note 2).

The review of the literature was summarized from the dearth of studies in the areas of: (a) deviance theories (Barker, 1968; Bell, 1976; Clinard, 1974; Cohen, 1966; Rezmierski and Kotre, 1972; Sagor, 1972); (b) delinquency and deviance (Bell, 1976; Cantrell and Cantrell, 1974; Cohen, 1966; Clinard, 1974; Des Jarlais, 1972; Gordon, 1974; Hirschi, 1969; Reidel, 1977; Thornberry, 1977; Weiss, 1977); (c) Characteristics of delinquents (Ackerson, 1942; Clements, 1960; Cohen, 1966; Compton, 1974; Browning, 1962; Glueck and Glueck, 1950; Hooke, 1968; Jenkins and Hewitt, 1946; Kvaraceus, 1959; Peterson, 1961; Polk, 1969; Poremba,

1974; Shaw and McKay, 1929) and (d) personality assessment (Bender, 1938; Bennett, 1960; Doll, 1953; Koppitz, 1963; Meehl, 1969; Peterson, 1961; Quay, 1964; Quay, Morse and Cutler, 1966; Quay, Peterson and Tiffany, 1961; Spivack, Haimes and Spotts, 1967).

Deviance Theories

Deviance, as considered herein, was concerned with interindividual deviance as perceived within the framework of four conceptual theories: (a) biological theories; (b) social deviance theories (Cohen, 1966); (c) ecological theories (Barker, 1968); and (d) personality trait theories (Clinard, 1974).

Biological Theories

The underlying precept of the biological theories was that deviance was in some manner organically determined either constitutionally, genetically, or as an organic anomaly or dysfunction (Cohen, 1966; Sagor, 1972). Biological theorists included geneticists (Godard, 1912; Jensen, 1968; Kahlman, 1954); developmentalists; Bender (1956) and Koppitz (1976); neurological theorists represented by Clements (1966), Werner (1945) and Strauss and Lehtinen (1947) and adherents to theories of biochemical dysfunctions such as Rimland (1972), Thompson (1967) and Feingold (1975). Biological theories assumed deviance to be a result of a pathology within the organism. Pathologies included abnormalities and/or organic deviations and biochemical or neurologic dysfunctions (Sagor, 1972).

Social Deviance Theories

Social deviance theory perceived deviance to be a result of conflict between an individual or a subculture and a societal or group value

or tenet (Cohen, 1966). Within social deviance theory, deviance was the result of an overt act or the acquiescence from an act (Cohen, 1966). Social deviance theorists dichotomized deviance into (a) the medical model; and (b) the deviance model. The medical perspective was concerned with epidemiology of deviance, while the deviance perspective was concerned with social rules as they predicated social interactions. Emphasis in the social deviance perspective was to determine (a) what factors promote conformity and (b) what interactions exist between those enforcing the rules and those who exhibit deviant behavior (Cohen, 1966; Des Jarlais, 1972; Elliott and Merrill, 1950; Merton, 1938). Social deviance theories relevant to delinquency were social disorganization and cultural transmission.

Social disorganization theory defined deviance as a breakdown in community interactions (Cohen, 1966). Applied to urban areas, social disorganization theory has been employed to explain juvenile delinquency and related urban community disorders. Elliott and Merrill (1950) discussed organized and disorganized communities within the larger community. "Organized," as employed by Elliott, implied that the psychological needs of individuals were met by traditional means (schools, churches, organizational activities). "Disorganized" implied that social institutions were not meeting the needs of the individuals.

Cultural transmission theory emphasized situational variables as they interacted with the individual. Deviance was considered to be a learned response to conflicting interactions between the environmental situation and the actor (individual) (Des Jarlais, 1972). Cohen stated that in cultural transmission "deviant behavior was determined by a subsystem of knowledge, beliefs, and attitudes that make possible, permit

or specify deviant behaviors in specific situations" (Cohen, 1966, p. 94). Cultural transmission theory has frequently been employed to explain juvenile delinquency and dropout problems within urban slum areas (Cohen, 1966; Des Jarlais, 1972).

Ecological Theories of Deviance

Ecological theorists perceived behavior as situation specific, controlled by stimuli emitted by an environmental agent (Wahler and Cormier, 1970). Deviance to the ecological theorists was behavior repeated in one or more settings perceived by an environmental agent-parent, teacher, etc. to need modification in any direction (Rhodes, 1967). To ecological theorists, deviant behavior was conflict between the individual and agents within the environment who perceived the behavior as deviant relative to the specific setting (Feagans, 1972; Laten and Katz, 1972). Cause of deviance, to these theorists, was inadequate reciprocity between the individual and the environment, the environment being considered as "diseased" as the individual (Rhodes, 1970, p. 43). Deviant behavior paradigms described within this theory included emotional disturbance, juvenile delinquency, school dropouts, underachievers, and learning disabilities (Feagans, 1972; Gump, 1967; Laten and Katz, 1975; Kohn, 1974; Schaeffer, 1968).

Personality Trait Theories of Deviance

Personality trait theories of deviance conceptualized deviance as a "kinds of person" disorder (Cohen, 1966). To these theorists deviance was a learned interaction resulting from the individual's reactions to situations. Individual reactions were determined by biological, physiological and neurological differences of people (Clinard, 1974;

Cohen, 1966; Malone, 1977; Scott, 1970). Personality trait theorists perceived individuals as exhibiting types (Jung, 1923/ 1971; Malone, 1977) or patterns of personality that interacted with their experiences as the global system perceived the experience (Schaefer, 1975; Scott, 1969). Deviance, to these theorists, was a result of repeated discrepancies between the individual's perception of an experience and societal perception of the same experience. Deviance was a learned reaction to repeated situational experiences as perceived by that individual's system.

Personality trait theorists promulgated that all interactions were biologically predicated as a result of either pathologies or individual somatypes (Jung, 1927/ 1971; Malone, 1977; Scott, 1969). Deviance within personality trait theories was a learned reaction to conflicts between the individual's perceptions of given stimuli and societal or individual expectations for the same stimuli (Ackerson, 1942; Peterson, 1961). Individual perceptions were the result of interactions between his/her biological makeup and adaptation mechanisms (Jung, 1927/ 1971).

Delinquency and Deviance Theories

Delinquency was defined as a societal, judicial, sociological, psychological (Hooke, 1968; Browning, 1962; Polk, 1976), and increasingly an educational construct designating repeated status offenses or criminal behaviors perpetrated by individuals less than 18 years of age (Brownell, 1954; Gagne, 1977; Knudten, 1976; Mesinger, 1977; Nelson and Kauffman, 1977; Wenk, 1976). Delinquency research has been confounded by the enumerable orientations and definitions of delinquent behavior. Each research discipline has defined delinquency within their specific

orientation and jargon (Bell, 1976; Cohen, 1966; Sabatino, 1973; Wenk, 1976). Definitions prior to the President's Commission on Law Enforcement and Administration of Justice Task Force in (1967) were primarily legally oriented (President's Commission, Note 5). The impetus of the Task Force report brought about new legislation and definitions which emphasized the acts and behaviors which led to adjudication rather than the legal result of the illegal acts (NIJJD Task Force, Note 6). Enactment of Public Law 93-415, the Juvenile Justice and Prevention Act in 1974, provided funding for a redefinition of the term "delinquent," delinquency research and standardization of state delinquency codes (Public Law 93-415, Note 9). Delinquent within this study was defined as a subject who had committed repeated acts: (a) of a kind which when perpetrated by adults, were punishable by law as either a misdemeanor or a felony; or (b) which were considered by local judicial agents to be status offenses (Glueck, 1950). This definition placed emphasis upon acts and behaviors of the individual, not upon the actions of a court of law (Kvaraceus, 1959).

Delinquency and Biological Theories

Adherents to the biological theory of deviance assumed delinquency was resultant to organismic damage caused by genetic, constitutional, prenatal, perinatal or postnatal insult, biochemical dysfunction of unknown etiology, anomaly or dysfunction (Cohen, 1966; Haywood, 1968; Sagor, 1972).

Bioanthropologic delinquency theorists focused upon body or somatypes. Adherents to this theory included Lombroso, Kretchner, Stratz, Hooten, Sheldon and Zeller (Muss, 1975). Delinquency within this theoretical framework was etiologically a result of (a) excessive instinctual

energy and weak impulse controls or (b) juxtaposed social conditions in which the agility, strength and physical prowess of mesomorphs were exploited by the cultural values (Glueck and Glueck, 1950; Muss, 1975).

Genetic theorists promulgated that delinquency was a result of genetically controlled behaviors - genetic transmission (Sabatino, 1973; Sabatino and Gramblett, 1969). Other less extreme theorists within this group stated that "genetics are that genetically controlled potential which is environmentally developed and controlled" (Jensen, 1968, p. 36). Two genetic theories of deviant behavior have received considerable attention: (a) chromosomal anomalies; and (b) familial disorders (Figlio, 1977).

Price and Strong (1966) analyzed 197 male mental patients and found seven detected cases of chromosome defect, where the 47th chromosome had either an extra x or y chromosome. Somatically, these males were taller, more active and manifested aggressive and/or violent behaviors (Price and Smith, cited in Figlio, 1977). Nielsen, Tsubor, Sturup and Romano (1968) analyzed 155 incarcerated males and identified 30% with abnormal karyotypic patterns. The percentage of this anomaly within the normal population is less than .001%. Tendencies of these criminals included violent crimes, arson, brutality, and self destructive traits (Nielsen, Tsubor, Sturup and Romano, 1968; Shah, 1974).

Familial disorders had been studied as one possible etiological factor in deviancy since the late 19th century. Henry Goddard traced, ex post facto, the Kallikak family history, where he described the effects of familial inbreeding and defective genetics. Goddard identified 480 descendents of a revolutionary soldier and his defective mistress. Goddard traced 143 feeble-minded, 180 who had been "criminal types"

(Goddard, 1912). Dugdale, in 1877, published a study of the "Jukes" in which familial disorders were studied for three generations, 50% of the descendents demonstrated criminal behaviors (cited in MacMillan, 1976, p. 18).

Neurological theorists perceived deviant behaviors to be a result of either endogenous or exogenous organic insult (Sweet, Ervin and Mark, 1969). The degree of deviance contingent upon the degree of organic damage (Shah, 1974). Shah listed the following neurological variables as conducive to criminal and delinquent behaviors:

1. Tumors and atrophic diseases of the limbic system
2. Seizure disorders
3. Minimal brain dysfunction, hyperkinesis and related neurological disorders. (Shah, 1974, pp. 110-113)

Studies have shown higher neurological deficits among delinquents than nondelinquents (Bingley, 1958; Bobath, 1953; Bradley, 1951). Blackhurst (1969) found significantly higher incidences of neurological organicity among delinquent males than nondelinquent males. Keldgold (1969) found a relationship between MBD and apprehended youths but did not indicate a causal relationship. Sabatino and Gramblett (1969) found children who had been ill with encephalitis exhibited anti-social behavior and personality disorders. Tarnapol (1970) studied 102 delinquent, ghetto dropouts and concluded that the incidence of MBD and subsequent reading deficits were significantly higher as indicated by neurological soft signs and academic deficits.

Koppitz (1973) found significantly higher incidences of MBD among delinquent and disturbed boys as measured by the Bender-Gestalt.

Rabinovitch, in several studies, concluded that neurological organicity was a contributing factor in adolescent delinquency (Rabinovitch, 1959; Rabinovitch and Ingram, 1962). Stafford and Taylor (1949) concluded that among convicted murderers, there were significantly more abnormal EEG's. Small (1966) found that 80% of 100 felons exhibited CNS dysfunction and/or seizure disorders.

Delinquent or deviant behaviors were frequently related to biochemical imbalances or deficits. Shah (1974) cited endocrine and biochemical imbalances. Feingold (1975) cited vitamin deficiencies and food additives. Studies to support these hypotheses were discrepant in their conclusions as well as in research methods (Figlio, 1977).

Delinquency and Social Deviance Theories

Delinquency within the framework of social deviance theory was perceived as a weakening, breakdown or abeyance of effective societal control (Figlio, 1977). Social deviance theory described delinquency as a dysfunction between the individual or subculture and societal controls (Cohen, 1966). Social deviance theories were the underlying hypothesis for several paradigms of delinquency. Social control theories asserted that delinquency was a result of weak, broken or absent moral bonds between the individual and the controlling societal values (Cohen, 1966; Nye, 1958; Weiss, 1977). Conversely, subculture theories of delinquency asserted that delinquent behavior occurred as a result of elements in the cultural milieu (Cohen, 1966; Reidel, 1977).

Delinquency was a failure of controls, either internal (personal) or external (societal) (Nye, 1958; Reckless, 1961; Reiss, 1951). Hirschi (1969), in his control theory, delineated controlling societal bonds as

follows: attachment, commitment, involvement and belief. To counter-balance societal bonds, Hirschi designated three control agents: family, judicial codes, and schools (Hirschi, 1969).

Social Disorganization Theories

Social disorganization theories of delinquency perceived delinquent acts to be a conflict or disjunction between cultural goals and socially acceptable methods of access to these goals (Cohen, 1966; Thornberry, 1977). Merton (1938) perceived deviant behavior to be an individual's reaction to an imbalance between stressed cultural goals and accepted ways of obtaining cultural goals. Merton's anomie theory viewed delinquency as a symptom of disassociation between socially structured means and culturally defined goals (Merton, 1938).

Cultural Transmission Theory

Cultural transmission theory was specifically a theory of delinquency and other aberrant behaviors of youth (Cohen, 1966). Cultural transmission theory focused upon personal interactions. Hence, delinquency was considered to be a result of conflicting interactions between the actor and the situation (Cohen, 1966). Adherents to cultural transmission theory included Cohen, Shaw and McKay, Sutherland, Cressey and Miller (Cohen, 1966; Thornberry, 1977). Cultural transmission theory focused upon three issues: (1) lower class delinquency in specific regions; (2) high crime rates in certain areas; and (3) the delinquency process (Thornberry, 1977). Cohen (1966) in Delinquent Boys, stated that delinquent behavior was relative to the norms of the culture. Shaw and McKay (1929), studied crime and delinquency in inner city areas, where they consistently found two prevailing factors: (1) higher crime and delinquency rates in industrial

inner city areas; (2) specific areas consistently had high delinquency rates regardless of the ethnic groups which move in or out.

Subculture theories of delinquency were specifically focused upon youth and adolescent behaviors. The focus of these theories was based upon assumptions and factors not addressed by other deviance theories.

1. Subcultural theories rely on official arrest and adjudication statistics.
2. Subcultural theories assume delinquency to be overt reflections of the conflicting environmental elements.
3. Subcultural theories assume delinquency is consequential to conflict between expected norms and learned behavior.
4. Subcultural theories assume that the subjects are psychologically normal.
5. Subcultural theories consider the judicial system to be a contributing factor to delinquency.
6. Subcultural theories assume deviance to be a reflection of pathology in the societal structure.
(Reidel, 1977, pp. 56-60)

According to Shaw (1975) delinquency within these theories was not characteristic of an individual or an act, but rather reflected different values within society (Shaw, 1975). Subculture theories placed primordial causal weight for delinquency not on the individual, but upon the societal conditions that produced the behavior (Reidel, 1977).

Ecological Theories of Delinquency

Ecological theories of delinquency focused on the interactions between the person and the environment synergistically. Unlike other theories of delinquency, ecological theories did not employ categorical labels. Ecologists perceived deviance or disturbance not within the

organism, but within the "ecosystem" (Feagans, 1972). Within this theoretical framework the schools, home, neighborhood or cohort group could be the source of pathology which evoked disturbed behavior on the part of youth (Cantrell and Cantrell, 1974). Ecological theory assumed that (a) the individual was a product of his environment, (b) that change in the environment would bring a change in behavior of the disturbed individual and (c) that pathology existed not within the individual, but within the synergy of interactions between the individual and the environmental variables (Feagans, 1972; Laten and Katz, 1975; Rhodes, 1967).

Delinquency and Educational Deviance Theories

Studies in delinquency have concluded that delinquents exhibited academic deviance (Brownell, 1954; Cohen, 1966; Figlio, 1977; Fox, 1977; MacFarlane, Allen and Honzig, 1962; Berman, Note 3; Compton, Note 8). Other researchers have concluded that educational deficits in average or above average students who exhibited learning disabilities were a primary cause of delinquency (Dresher, 1957; Holte, 1972; Jordon, 1974; Peterson, 1971; Powell, 1976; Rabinovitch, 1956; Tarnapol, 1970; Berman, Note 3; Compton, Note 8). Conversely, research based on prior studies have concluded that educational dysfunction was a related cause of delinquency, but not a primary cause of delinquent behavior (Kohn, 1968, 1977; West and Farrington, 1975).

Educational dysfunction was a characteristic of most delinquents, lags in reading were more prevalent among delinquents than other academic deficits (Brownell, 1954; Irwin and Marks, 1924; Powell, 1976; Tarnapol, 1970; West and Farrington, 1975; Wirt and Briggs, 1959). Brownell (1954)

cited the schools for failing to meet the individual needs of behavioral problems, which in turn created delinquent behavior patterns.

West and Farrington (1975) conducted a longitudinal study with 411 boys; of the 101 who became delinquent, 70% demonstrated reading and other academic lags. Schaefer (1968) identified deficit task skills in 80% of the children he studied with delinquent or deviant behavior patterns. Healy and Bronner (1948) cited failure in school as a contributing factor in subsequent delinquent behavior patterns, citing teacher attitudes toward troubled children as the primary area remiss. Other researchers cited the schools as contributing to delinquency were Dreshler (1957), Kvaraceus (1945), Glueck and Glueck (1950); Mesinger, 1977; Nelson, Kauffman, 1977; Elliott and Voss, 1974; West and Farrington, 1975).

Delinquent Behavior and Learning Disabilities

Harris (1948) stated that most researchers agreed that delinquent behaviors usually were subsequent to academic failure in seemingly capable children (Harris, 1948). Other adherents to this precept were Glueck and Glueck (1934), Bronner and Healy (1948). Harris (1948), Brownell (1954) and Dreshler (1957) chastised teachers for not referring children with problems prior to the time they became either behavior problems or legally adjudicated. Harris (1948) and Glueck and Glueck (1945, 1950) were among the first to describe delinquency along a continuum from delinquent behaviors to official delinquency. Glueck and Glueck (1945) hypothesized that the first step in delinquency prevention was early recognition by teachers, followed by individualization of curriculum to meet the needs of students. Glueck and Glueck (1945, 1950) and Harris (1948) developed behavioral clusters which they believed

would identify high risk students. Proponents of the learning disabilities (functional and/or clinical) juvenile delinquency relationship perceived a direct relationship between school failure and delinquency (Jordan, 1974; Holte, 1972; Kohn, 1968, 1975; Mesinger, 1977; Peterson, 1961; Tarnapol, 1970; West and Farrington, 1975; Berman, Note 3; Compton, Note 8; Poremba, Note 2). Opponents perceived the juvenile delinquency-delinquent behavior syndrome to be of such complexity that academic dysfunction was considered to be a contributing factor not a primary factor (Elliott and Voss, 1974; Flew, 1973; Murray, 1976).

Delinquent behavior has been related to learning dysfunction and low academic achievement since the Wickman study (1928). Repeatedly, ex post facto studies of delinquent behavior have discussed academic deficits among delinquents (Cohen, 1955; Khleif, 1964; MacFarlane, Allen and Honzik, 1954; Power, Benn and Morris, 1972; Sutherland and Cressey, 1970; Tait and Hodges, 1971). A number of studies reported a causal relationship between learning disabilities and juvenile delinquency (Berman, 1972; Compton, 1974; Gordon, 1974; Poremba, 1972). Other studies reported that no causal relationship existed between learning disabilities and juvenile delinquency (Critchley, 1968; Flew, 1973; Murray, 1976). There was ostensibly no challenge to the learning disabilities-delinquency relationship (Murray, 1976; Kohn, 1977; West, 1975). The challenge was to the premise which promulgated a cause-effect relationship (Murray, 1976; West and Farrington, 1975; Wolfgang, et al, 1972).

Personality Trait Theories and Delinquency

In discussing personality research, Naylor (1972) stated personality research had been "rather piecemeal and unintegrated" (p. 1). The survey

of the literature demonstrated this fact. Personality trait terminology and measurement have changed with the orientation of the researcher. There are, however, basically two types of personality variables: (a) structural, and (b) dynamic (Cattell, 1957; Naylor, 1972).

Structural personality variables were those qualities of personality which were not subject to change. Variables of this nature were extroversion-introversion, dominance-submissiveness, etc. (Naylor, 1972). Eysenck and Eysenck (1969) designated these constitutional bipolar traits as personality factors. Regardless of disparate terminology structure variables of personality were those static aspects of affective development limited only by the innated limits of genetic transmission and subsequent cultivation by experience (Eysenck and Eysenck, 1969). Dynamic variables of personality were changing traits, shaped and molded by ontogenetic variables (Naylor, 1972, p. 1). Cattell (1957) designated these qualities as surface traits (p. 16).

By definition personality was a construct employed to designate the total configuration of an individual's cognitive, conative and affective components. Personality is the synergistic design of the individual (Eysenck and Eysenck, 1969). Drever (1952) offers the following definition of personality:

The integrated and dynamic organization of the physical, mental, moral and social qualities of the individual, as that manifests itself to other people, in the give and take of social life; on further analysis it would appear in the main to comprise the natural and acquired impulses and habits, interests and complexes, the sentiments and ideals, the opinions and beliefs, as manifested in his relations with his social milieu. (p. 208).

The biological theory of personality development maintained that the potential of a personality was preset genetically and either deterred or ameliorated by environmental stimuli (Rosenthal, 1963, cited in Sagor, 1972, p. 59). Biological theories of personality development assumed constitutional and/or genetic predetermination of specific structured personality traits (Cattell, 1965; Eysenck and Eysenck, 1969; Sagor, 1972). Jung (1921/ 1951) asserted that personality types were guided by the instinctual energies of the individual, preset genetically.

Eysenck (1969) hypothesized that 75% of interindividual personality differences were attributable to genetic predisposition. Biogenetically oriented personality theorists assumed deviant personality to be a result of autonomic nervous system dysfunction. Eysenck (1969) attributed personality deviance to be a result of deficit cortical arousal, a theory further supported by Savage (1964). Lüscher (Scott, 1969) perceived personality to reflect biologically initiated reactions to situations as they were perceived by the neurological centers.

Personality development within the social deviance model was a result of learned interactions between the individual and surrounding environmental variables (Clinard, 1974; Cohen, 1955, 1966; Conger and Miller, 1966; Kohn, 1968, 1977; MacFarlane, Allen and Honzik, 1962). Deviant personality within this model resulted when the learned interactions presented conflict with societal, cultural or personal value standards (Des Jarlais, 1972). Adherents to this theory perceived deviance as a disease between the dominant subculture and the dominant culture (Cohen, 1966).

Techniques of Personality Assessment

Personality assessment techniques are of two broad categorical groups: (a) personality inventories; and (b) projective techniques (Anastasi, 1976). Personality inventories provide several approaches to personality assessment: (a) self-report inventories; (b) observational inventories; (c) behavior checklists; (d) typologies; and (e) interview checklists (Anastasi, 1976).

Personality inventories are standardized instruments in which both the stimulus and the response are structured to yield objective and quantitative results (Anastasi, 1976; Cattell, 1957). Self-reporting inventories are paper and pencil tests in which the respondee records his/her answers to structured questions, usually situationally oriented. Self-reporting assessment techniques measure values, problems, personality traits and attitudes. Among the more frequently employed self reporting personality assessment instruments are the following: (a) the Minnesota Multiphasic Personality Inventory (MMPI); (b) the California Psychological Inventory (CPI); (c) the Guilford Zimmerman Temperment Survey; (d) the Sixteen Personality Factor Questionnaire; (e) the School Personality Questionnaire; and (f) the Edwards Personal Preference Schedule (EPPS), (Anastasi, 1976; Griffiths, 1970).

Critics of self-reporting inventories cited four common areas of criticism: (a) possibility of faking by the examinee; (b) situational specificity of test questions; (c) reliability and generalizability of obtained data; and (d) construct validity (Anastasi, 1976; Lindzey, 1961).

Observational checklists were frequently designed to elicit response by parents, teachers and/or peers. Checklists elicited data to determine deficits or strengths of behavior patterns (Conners, 1969;

Daughton and Fix, 1978; Doll, 1953; Peterson, 1961; Quay, 1964, 1966; Quay, Morse and Cutler, 1966; Quay, Peterson and Tiffany, 1961; Spivack, Haimes and Spotts, 1967; Schaeffer, Note 11). Checklists currently employed to assess personality disorders among adolescents included the Walker Problem Checklist (Walker, 1967); Devereaux Adolescent Behavior Rating Scale (Spivack and Spotts, 1977); Problem Behavior Checklist (Quay and Peterson, 1964).

Typologies were a categorical group of assessment instruments, developed via factor analysis (Jenkins and Hewitt, 1946; Cohen, 1966). Typologies were designed to identify behavioral clusters and/or behavior syndromes (Smiley, 1977).

The interview technique was employed by researchers to determine observed behavior either ex post facto or in progress from observers of the subject. Interview techniques were employed frequently in delinquency research (Cohen, 1955; Fieldhusen, Benning and Thurston, 1972; Glueck and Glueck, 1950; Hooke, 1966; Kvaraceus, 1953, 1956; and Mukerjee, 1971). Ecological theorists employed interview techniques to obtain different perceptions of the same subject in different situational settings (Cantrell and Cantrell, 1974; Rhodes, 1967, 1970; Thomas and Melody, 1977).

Projective Techniques

Projective techniques are psychological instruments employed as diagnostic tools designed to tap "projections" of the individual's underlying personality (Frazier, Campbell, Marshall and Werner, 1975). Projective devices, according to Anastasi (1976), were differentiated in design and purpose from other testing techniques by four major characteristics:

(a) stimuli presented was unstructured; (b) directions were nondirective; (c) responses were more varied and less standardized; and (d) traits were measured as a part of the individual's global functions rather than as an aspect of situational reactions (Anastasi, 1976).

Critics of projective techniques cited lack of structure in scoring, weakness within standardization methods and lack of objective (quantitative) and reliable scoring procedures as deficits of projective techniques. Adherents of projective methods cited strengths which ranged from low test anxiety to the lessened chance of deliberate faking of responses (Anastasi, 1976).

Projective Color Tests

The idea of color and light as an influence upon man has interested man since the earliest civilizations (Birren, 1941, 1960; Jayne, 1925). Clark (1975) discussed the evolution of medical color therapy through the ages, beginning with the Egyptian civilization (Clark, 1975). Prescott (1942) discussed psychological therapy and the use of colored lights as a therapeutic agent. Cited by Prescott were psychotherapy studies in which the effect of various colors upon the organism were studied and reported. Larkens and Sherman (1935) reported no viable effect of color therapy upon psychotic patients (cited in Prescott, 1942). An institution in Massachusetts, experimenting with color therapy concluded that for psychotic patients, blue was quieting, red and yellow excitatory (Prescott, 1941). Prescott also concluded psychotic patients were quieted by violet and stimulated by yellow. Scott (1969), Sprole (1973) and Johnson (1974) found a preference of violet among disturbed patients.

Birren (1961) in discussing the effect of color on humans, reported an increase in blood pressure and pulse rate when subjects were exposed to red light. Bright hued lights - red, hues of red and warm colors - attracted the organism toward the stimulus, arousing stimulation. Cool colors (blue, green and violet) was caused to withdrawal of the organism away from the stimuli (Birren, 1969).

Birren (1969), in studying the effect of color upon muscle strength and cortical arousal, concluded that bright colors increase body tension, heart rate, and related functions of the autonomic nervous centers. Birren suggested that these reactions indicated that reaction to color was a neurologically precipitated reaction. Goldstein (1939, 1942) cited an increase in muscle tension when blindfolded subjects were exposed to red light; Goldstein also reported losses in equilibrium and misjudgment in cutaneous location.

Psychological Color Research

Color theorists were adherents to the biological/medical model of deviance, and assumed that reaction to color was neurologically determined. Schaie (1961) stated "unquestionably, color has a physical effect upon the human organism" (p. 16). "Color preference is a cue to personality" (Schaie, 1961, p. 46). Goldstein (1939) determined that reaction to color manifested observable changes in musculature and reaction time. The second assertion of this study was that observed deviance in behavior would be reflected in color selection and/or preferences. This assertion was cited in the literature by Birren (1950, 1966, 1978), Schaie (1961), Schaie and Heiss (1964), Goldstein (1939, 1942), Pfister (1950), Rorschach (1925, 1951) and Luscher (1949, cited in Scott, 1969).

Personality Reflected in Color Preferences

Studies relating personality and color preferences have been cited in the literature since the middle 1800's. However, much of the research appeared in German and Swiss journals. The investigator of this study surveyed only articles in English or articles which could be obtained in English from the authors in order to prevent misinterpretation of results.

Katz (1921) and Emery (1929) reported investigations relating color preferences in subjects exhibiting emotional disorders. He found blue to be first choice, green second, and red third. The marked preference for blue was higher among patients with dementia praecox. Emery (1929), found yellow to be selected most frequently by schizophrenics.

Dorcus (1926), in a classical study relating color preference to personality, reviewed the literature through 1926. He challenged the manner in which previous studies had been designed and stated that previous investigators had not controlled for age, sex, stimuli and presentation of stimuli. In presenting standardized stimuli Dorcus recorded the following results: (a) there were insignificant differences in color preferences according to age, except among children; (b) sex differences had no significant effect on preferences; (c) children preferred bright colors while adults (except emotionally disturbed) preferred more sedate colors; and (d) emotionally disturbed and elderly groups reflected a preference for purple. Luscher (cited in Scott, 1969), Klar (1966), and Johnson (1974) presented results supportive of the choice of purple among disturbed patients in studies relating the Luscher Color Test to personality configurations. Granger (1955) in a study measuring color preferences between normal and disturbed patients, found two relevant findings:

(a) no difference as indicated by sex and (b) preference by normal patients for blues and greens. Birren (1966) cites this choice as common among healthy individuals.

Guilford (1959) investigated preferences among adults without personality disorders and concluded that blues and greens were significantly preferred, while yellows and yellow greens were least preferred. Birren (1961) indicated that emotionally healthy individuals preferred greens, blue and violet, while rejecting black and brown, the criteria was not in colors liked, but rather in colors rejected. Introverts preferred blue and green; extroverts preferred red and oranges. Schaie (1966), studied personality and color preferences where he concluded that specific color preferences were indicative of specific personality traits.

Cerbus and Nichols (1963) designed research to investigate the correlation between personality and reaction to color. They concluded that there was a relationship, but that color tests needed to be quantitatively scored to allow for generalization between and among groups. Schaie and Heiss (1964) found significant relationships between personality and color preference, and cited a need for quantification of scores. The third assumption of this study stated that the use of color preferences to indicate personality variables would be more effective if a quantitative scale was applied to the interpretive format of the LSCT.

Neurological Responses to Color

The effect of color upon the organism had been studied to determine if there were overt organic responses. Pressey (1921) studied the effect of color upon body rhythm, vital signs, memory and free association. Pressey reported the following results: (a) stimulation of mental activity when

the organism was surrounded by bright colors; (b) depression of mental activity when the organism was surrounded by low stimulus colors. Pressey also reported no observed overt effect upon musculature.

Goldstein (1939, 1942) in his research with war victims, concluded that the organism's response to color was accompanied by specific observable reactions. In studying reaction to color by brain damaged World War I veterans, Goldstein (1939) found an increase in pulse, respiration, blood pressure, muscle reaction and hyperactivity when victims were exposed to bright colors.

Three projective color tests received attention in the literature: (a) the Color Pyramid Test (CPT) (Schaie and Heiss, 1964); (b) the Rorschach inkblots (Rorschach, 1925); and (c) the Luscher Color Test (1949, cited in Scott, 1969). Color tests were of two kinds: (a) forced choice, projective; and (b) projective inferences (interaction of color and form) (Schaie, 1966). Projective techniques were based upon the assumptions that external behaviors reflected attitudes, feelings and values as perceived by the organism at the unconscious thought level (Anastasi, 1976; Lindzey, 1961). Advantages of projective techniques according to Lindzey (1961) were the possibility for measurement of more than one variable of the individual; and insignificant differences in cross-cultural responses. Disadvantages reported by Lindzey included lack of quantification in scoring methods, lack of consistency in stimuli presentation and lack of scoring norms.

The Color Pyramid Test (Schaie and Heiss, 1964) is a color test based upon the precept that personality variables reflected the organism's response to interactions between color and form (Schaie and Heiss, 1964). Schaie (1966) stated, the Color Pyramid Test (CPT) was based upon observed

and measured tendencies of individuals to "attend or avoid certain colors" (p. 518). Schaie (1969) concluded that:

color selection reflects the interaction of the individual and external stimuli, adults who avoid the use of one or two colors of a wide array of colors evidenced differentiation and restriction of external stimulus selection, and adults who employ only a few colors indicate personality disorder and withdrawal tendencies. (p. 518)

Schaie stated further that color studies reflected the inner dynamics of the individual without his awareness of what was being measured (Schaie and Heiss, 1964).

The most frequently researched personality test in which color was a variable was the Rorschach inkblot test (Beck, 1952; Klopfer, 1954; Klopfer and Davidson, 1962). Rorschach based the inkblot test upon type psychology as discussed by Jung. The survey of Rorschach literature in this study discussed only studies which related color responses and personality in children and adolescents.

Hertzman and Margules (1943) studied Rorschach color response changes in subjects 12-17 years of age. All subjects were matched on all variables except age. Older subject responses demonstrated (a) more shading responses; (b) fewer pure color responses; (c) more pure form responses; and (d) more total responses. Younger responses were converse to the results of older subjects except fewer differentiated responses were recorded. Hertz and Baker (1943), studied adolescent color responses, reporting the following patterns (a) children 12 years of age were more easily stimulated and gave more pure color responses and fewer pure form responses than older subjects. (b) Children 15 years of age and older revealed patterns more similar to adult patterns, exhibited more differentiation and fewer movement responses.

Werner (1945), studied children who exhibited brain damage and concluded that brain injured children exhibited conflicting response patterns which paralleled their observed conflicting behavior patterns. Brain injured children exhibited:

1. Disinhibited responses in sensory and motor areas
2. Impulsive, meticulousness pattern analysis as indicated by their attempts to analyze the entire inkblot
3. Disintegrated visual perception as indicated by figure ground errors
4. Fluidity of pattern association between similar patterns
5. Rigidity of behavior as indicated by fewer responses (pp. 108-109)

Strauss and Lehtinen (1947) reported similar observed behavioral characteristics among brain-injured children.

Schachtel (1950), investigated delinquent and nondelinquent subjects observed by Glueck and Glueck (1950). Schachtel found significantly different configuration responses between delinquents and nondelinquents. Delinquents gave fewer total responses, indicating a tendency toward external control and deficit verbal skills. Delinquents responded with significantly more pure color responses, fewer shaded color responses, and fewer total responses than did nondelinquents. Schachtel (1950) stated no single response group was pronounced for delinquents, but that analysis of the total Rorschach configurations were significant among delinquent subjects.

The Luscher Test

The Luscher Color Test (Luscher, 1969, cited in Scott, 1969) is a forced-choice color test, interpreted projectively. Central to Luscher's theory of test development were Jung's concepts of introversion and

extroversion. Luscher, however, unlike Jung, dichotomized personality types as either concentric--active or passive--and excentric--active or passive; concentric types designated internally (subjectively) oriented subjects, excentric types designated subjects more externally (objectively) oriented. According to Scott (1969) the "excentric individual is interested in his environment, in the things and people around him" (p. 26). Scott explicated this further by identifying two excentric subject orientations:

1. When the subject is externally excentric, he/she is heteronomous
2. When the subject is internally excentric, he/she is causative to his/her environment, thus, autonomous.
(Scott, p. 27)

Conversely, concentric subjects were self-oriented.

Central to Luscher's theory were four chromatic colors termed "psychological primaries"--red, dark blue, blue-green, and yellow--and their relationship to the concepts of autonomous and heteronomous (pp. 26-28). Klar (1971, cited in Johnson, 1974) (see Footnote¹), discussed Luscher's theory and explicated the color-concept relationship in the following ways: (a) blue and green were considered indicative of passivity. (b) Red and yellow, when blue and green were rejected, were indicative of an active individual. The autonomous individual was a causative (change) agent in his environment. The "heteronomous individual was the effect of his environment" (Scott, 1969, p. 27).

The original Luscher Color Test (1949, cited in Scott, 1969), consisted of seven color plates, containing seventy-three colors. According to Luscher, each color reflected a physiologically or biologically oriented need. Klar designed a personality cube to explicate Luscher's underlying

¹Not available in English

theory of physiological needs and their relationship to the concepts of autonomous-heteronomous; active-passive (see Appendix B, Figure 1). He investigated adipose and non-adipose women and reported that non-adipose women selected red, blue, yellow, green, gray, black, brown and violet. Adipose women selected green, blue, gray, violet, red, brown, black and yellow. Klar concluded that adipose women exhibited a significant aversion to yellow, juxtaposed with a significant acceptance of green. According to Luscher, this pattern indicates "a defense against rejection and lack of recognition" (cited in Klar, 1966, p. 7).

Klar (1961) studied test anxiety among adolescents and concluded that pre-test anxiety influenced color selection; following the test, anxiety decreased and color selection returned to normal. Klar (1968), reported that disturbed children demonstrated a significantly more immature selection pattern than normal children. The immature selection pattern was indicated, according to Klar, by a choice of purple in the first and second position. Klar concluded that this indicated a desire to be protected and allowed to remain in their child's world. In an investigation of children residing in orphanages, Klar (1973) reported that children who exhibited high masturbation tendencies were children who lacked exposure to a mother image; the masturbation syndrome was, according to Klar, an attempt to "satisfy stress-inducing drives without becoming emotionally involved" (p. 18).

American research involving the LSCAT began with Carney (1971). Carney tested 44 kindergarten children to assess feasibility of utilizing the LSCAT to diagnose children with learning disorders. The sample was comprised of 24 males and 20 females attending preschool education program. The study compared scores obtained on: (a) the Metropolitan Test

of Reading Readiness (MTRR); (b) teacher observation of three developmental areas: academic achievement, social development, and observed behavior; and (c) two LSCIT selection patterns. Carney presented the following results:

1. Violet was selected in first to fifth position by 42 out of 44 subjects. Twenty-six subjects selected violet in first position. Of the 18 subjects selecting purple in positions other than first, all exhibited either academic or behavior problems.
2. Blue selected in positions one through five correlated with successful academic achievement.
3. Black placed in positions six through eight correlated with satisfactory emotional adjustment as measured by teacher observation. (p. 28)

Sproles (1973) reported data obtained while studying four subject groups: psychotic, delinquent, drug abusers, and normal adolescents. Sproles found no significant differences between groups except the frequency of violet in positions one through five among psychotics.

Johnson (1974) administered the LSCIT to 286 disturbed patients as part of the admission test battery as they were admitted for treatment to a southern psychiatric clinic. He reported the following difference from Scott's (1969) study wherein he indicated that "violet was ranked in first or second position by the disturbed patients compared to sixth position by the normal British subjects" (p. 9). Johnson concluded that further research should be designed to determine whether violet (5) should be considered as an anxiety color when observed in the first through fourth position among subjects above 12 years of age. Johnson's findings concurred with those reported by Sproles (1973).

Manzo (1972) identified basic personality characteristics and learning styles among Adult Basic Education (ABE) students as measured

by three instruments: the Luscher Color Test, the Manzo Bestiary Inventory and the Learning Preference Inventory. Significant correlations between the Manzo Bestiary and LSCT were reported.

Tesser studied personality traits of 900 United States senior Army officers to determine whether officers exhibited different personality traits from a control group; and whether officers from different branches of the service exhibit differentiated personality traits. Tesser reported the following observations:

1. Professional officers exhibited slightly different personality traits as exhibited by color pattern selection.
2. Preference of blue indicated a tendency among males to be authoritarian among both groups.
3. Different branches of the service demonstrated different patterns of personality traits as measured by the Luscher Color Test (1975).

In summary, the author has presented a survey of literature relevant to deviance theories, deviance as it relates to delinquency, delinquent personality assessment, techniques of projective testing and projective color test research as these subjects relate to the purposes of this investigation. An extended review of the characteristics of delinquent, learning disabled and emotionally disturbed adolescents appears in Appendix A with a summary of symptoms by author presented in Table A. Previous Luscher data obtained by Scott (1970), Klar (1961), and Johnson (1974) are presented in Appendix B. Appendix C carries the letters of permission granting permission to use selected materials and permission to use selected subjects. Appendix D carries directions to the subject and interpretive data for the LSCT. Appendices E and F contain raw pilot data and study data obtained during this investigation.

CHAPTER III

METHOD AND DESIGN

Procedure

Each subject was administered the LSCT. The LSCT was administered by the investigator and a counselor trained for the administration task. Training of the counselor consisted of three two hour training sessions in which the investigator taught the counselor to administer, group and mark LSCT function groups. The assistant was not taught to score student profiles. Standardized administrative procedures were employed by both testers. All tests were administered in well-lighted, sparsely furnished rooms.

The LSCT was administered to (a) 53 subjects attending regular classes; (b) 44 subjects attending learning disabilities classes; and (c) 42 predelinquent subjects attending alternative education programs. All subjects were students attending eighth, ninth or tenth grade classes. Administrative procedures were those set forth in the Luscher Manual (Scott, 1969). Directions to the subject and interpretive procedures are included in Appendix D, p. 126.

Subject Profile

Subject responses were recorded on a response and scoring form developed by the investigator (see Appendix E). Responses were recorded twice, 3 minutes apart. Identifying information was sealed in an envelope and numerical codes were placed on the response forms.

Scoring and Interpretation

Each subject response profile was scored as follows: (a) response one and response two were recorded; (b) the second response was grouped into Luscher function groups; (c) anxieties and compensations were allocated and summated as directed in the Luscher Manual (Scott, 1969); (d) all function group color combinations were listed on the response form; (see Appendix E); (e) each subject's ranked color preference was then numerically scored according to the investigator's scoring scale (see Table 2).

Population and Sample

The subjects for this study were eighth, ninth and tenth grade students from nine metropolitan secondary schools located in central Oklahoma. Subjects attended two middle schools, two mid-high schools, one four-year high school, two junior high schools and two alternative schools. Secondary aged subjects were chosen for this study based upon research which had demonstrated school egress rates for LD/BD adolescents to be highest during the year between eighth and ninth grades, leveling off during tenth grade (Hooke, 1966; Mukerjee, 1973; Poremba, 1974; West, 1973). From this population samples were selected in the following manner: (a) letters were sent home by all students--exclusive of those students

attending classes for the mentally retarded--in nine schools. (b) Upon return of the consent forms, subjects were grouped according to their grade level and educational category: regular, learning disabled, or predelinquent.

Educational categories were delimited as follows: (a) regular class placement indicated the subject was functioning on or above grade level. (b) Learning disabled placement meant the subject had been diagnosed as having average or above average intelligence and impairment in one or more of the following psychological processes: perception, conception, comprehension or expression as indicated by the present discrepancy between potential ability and present achievement level. (c) Predelinquent placement indicated that the subject had been expelled from school for truancy, behavior problems, absenteeism, or has dropped out of school. Predelinquent children had already incurred two or more contacts with law enforcement agencies, but were not presently adjudicated nor had they ever been incarcerated. All predelinquent subjects exhibited academic deficits of one or more years in one or more subject areas.

One hundred and thirty-nine subjects were grouped by grade level and educational category into nine samples. Distribution within each group was as follows: (a) sample one consisted of 14 eighth-grade subjects attending regular classes; (b) sample two consisted of 16 eighth-grade subjects attending learning disabilities classes; (c) sample three consisted of 12 predelinquent eighth-grade subjects attending an alternative school; (d) sample four consisted of 23 ninth-grade subjects attending regular classes; (e) sample five consisted of 16 ninth-grade subjects attending learning disabilities resource rooms; (f) sample six consisted of 14 predelinquent ninth-grade subjects attending the

alternative classes; (g) sample seven consisted of 14 tenth grade subjects attending regular classes; (h) sample eight consisted of 14 tenth grade subjects attending learning disabilities classes; (i) sample nine consisted of 16 predelinquent tenth grade subjects attending an alternative school. See Table 1 for distribution of sample size by grade and group. All subjects ranged between 13 and 16 years of age at the time they were tested, except those subjects within the tenth grade predelinquent sample. Within the predelinquent sample most subjects were 17 having been retained at some point in their educational program.

Table 1
Distribution for Subjects by Grade Level
and Educational Group

Grade	Regular	Learning Disabled	Predelinquent	n
Eighth	14	16	12	42
Ninth	23	16	4	43
Tenth	14	14	6	34
n	51	46	42	Total n 139

Sampling criteria for this study were twofold: (a) sampling procedures needed to meet the needs of data analysis phase one; and (b) sampling procedures needed to meet the data analysis in phase two. Phase one procedures were employed to provide continuity between this investigation and previous statistical studies of the L SCT conducted by Klar (1959) and Scott (1969). Data obtained from all subjects were employed during phase one. Phase two analyses were conducted to establish the effectiveness of the investigator's scoring scale. Phase two analyses required that subjects within sample groups be randomly selected to meet

the underlying assumptions necessary to perform an ANOVA. Subjects were randomly selected from within each sample group to meet the requirement of equal n within cells; no subject changed educational group or grade level.

Instrumentation

Two instruments were utilized: (a) the Luscher Short Color Test (LSCT); and (b) a numerical scoring system developed by the experimenter. A description of both instruments follows:

The Luscher Short Color Test (LSCT)

The Luscher Color Test was a projective technique designed by Swiss psychologist, Max Luscher, in 1947. It was developed to identify individual personality configurations and has been employed extensively in Europe and Great Britain where studies of construct validity were carried out with considerable success (Scott, 1969, 1970). At present there are no American reliability nor validity norms (Johnson, 1974). The test consists of eight color plates 1½ X 2 inches in size with numbers on the back for the examiner to record.

Administration procedures were designed in such a manner that paraprofessionals as well as professionals could administer the test (Scott, 1969). Administration involved selection by the subject of eight standardized colors in rank preference order twice, a few seconds apart. Administration time was approximately five minutes.

The subject was requested to arrange the colors in descending rank order twice approximately three minutes apart. Both selections were recorded numerically, the second selection was employed for interpretation (see Appendix D, p. 126 for directions to subject). For the purpose of this

study each protocol was scored twice. The first scoring was performed according to the translated Luscher Manual (Scott, 1969) and the second scoring according to the investigator's scoring scale. An author designed recording-scoring form was employed to record each subject's responses (see Appendix D, p. 126).

Interpretation of the LSCT according to Luscher (Scott, 1969), was based upon: (a) position of each of the eight colors; (b) color combinations within each of five function groups; and (c) calculation of the anxieties and compensations within each profile. The manual contained interpretive information for each function and summated anxiety and compensation frequencies based upon the responses of a British population (Scott, 1969). Johnson (1974) and Tesser (1975), however, established between groups' reliability for differentiation of personality configurations. Johnson differentiated between normal and psychotic patients, $\chi^2 = 41.98$, $df = 7$, $p > .001$ (Johnson, 1974). Johnson's conclusions supported the results of earlier studies which concluded that the LSCT reliably differentiated between adult groups (Astrom and Tobiasson, 1965; Klar, 1959, 1961; Scott, 1969). Tesser (1975) found Chi Square comparisons significant between authoritarian and nonauthoritarian types of adults. Manzo (1975) concluded that there were significant correlations between characteristics identified by the Manzo Bestiary Inventory and those characteristics identified by the LSCT. No statistical data were presented, however.

Scaling the LSCT

Prior to this study no quantitative scoring scale had been developed to quantitatively measure interindividual and between group

differences as identified by the LSCT. The only quantitative data provided for within the Luscher Manual were frequencies of allotted anxiety and compensations. Anxieties were calculated by allotting negative allocations when a psychological primary color occurred in positions six through eight. Compensations were calculated by allotting negative allocations if any of the auxiliary colors occurred in positions one to three (Scott, 1969, p. 37).

To provide a quantitative measure, the author developed and piloted a scoring scale. The investigator's scale was a weighted numerical scale based upon the interpretive schematics set forth by Luscher (Scott, 1969). Scaling theory identified the forced choice rank-order preference scale employed by Luscher as a successive intervals rating scale. Successive interval scales assumed equal distance between preferences (Edwards, 1957). Successive interval scaling was based upon the Coombs simple unfolding model for preference scaling. Coombs' model promulgated that the less distance between first choice and subsequent choices, the higher the subject's proclivity toward that particular preference (Coombs, cited in Carroll, 1972).

Luscher stated that "the four psychological primary colors--red (3), blue (1), yellow (4) and green (2) should preferably occur in the first four positions or at least in the first five; the achromatics--gray, black and brown should occur in positions six through seven and eight." (p. 8). The psychological primaries were significant when they occurred in any positions other than first through fifth. The achromatic colors were significant when they occurred prior to sixth position. Violet (5) was significant when it occurred in any position other than 3rd through 7th, except in adolescents and pregnant women; in these cases, violet (5) could

also occur in positions one and two (Klar, 1961; Scott, 1970). In addition to the significance of color position, Luscher calculated negative anxieties (A!) and compensations (C!) according to the following formulae:

(1) Where a basic color occurs in 6th position, allot 1; (2) where a basic color occurs in 7th position, allot 2; (3) where a basic color occurs in 8th position, allot 3. A similar method is adopted for measuring the intensity of the compulsion associated with compensations, as follows: (1) where a basic color or violet occurs as a compensation, no allotment; (2) where gray, brown or black occurs in 3rd place, allot 1; (3) where gray, brown or black occurs in 2nd place, allot 2; (4) where gray, brown or black occurs in 1st place, allot 3. (Scott, 1969, p. 37)

Based upon the above stated contingencies set forth by Luscher, the following weighted positional scale and summation formula were developed (see Table 2). The scales were piloted, modified and recycled through four pilot tests, pilot studies are exhibited in Appendix E.

To provide indices for color position displacement not indicated by earlier scales, it was necessary to calculate position scores minus anxiety and compensation scores. Thus, color score (CS) was the sum of the position scores minus the sum of anxieties and compensations.

$$X_1 + X_2 + X_3 + \dots X_8 - \sum (A + C)$$

To provide positive discrimination for subjects with zero (0) anxieties or compensations, but equal position scores it was necessary to add (+) bonus points.

Pilot Studies

To develop and refine the investigator's numerical scoring scale, four pilot tests were carried out. Pilot tests one, two and three involved the same two groups of subjects: ten students presently attending high

Table 2
Color Scoring Scale

Points	Positions								Possible Score
	* 1	2	3	4	5	6	7	8	16 + 2 no anxieties or compensa- tions
Score 2	1,2,3,4 ²	1,2,3,4 ²	1,2,3,4 ²	1,2,4 ²	5,6 ²	5,6,0 ²	6,7,0 ²	6,7 ²	
Score 1	5 ¹	5 ¹	5,6 ¹	5,6 ¹	0,1, 2,3,4 ¹	7 ¹		5 ¹	

Summated Color Score Formula: $CS = X_1 + X_2 + X_3 + \dots + X_8 - \sum(A + C)**$

Code*

- Blue - (1)
- Red - (3)
- Green - (2)
- Yellow - (4)
- Violet - (5)
- Brown - (6)
- Black - (7)
- Gray - (0)

CS = color score

= sum of

A = anxieties

C = compensations

** = when 0 A's or C's add points as follows:

if CS = 15 to 16, 2 points;

if CS = 13 to 14, 1 point

school and ten students presently attending an alternative school for predelinquents. The test was administered as recommended in the manual; profile preferences were recorded and scored. Pilot test data may be found in Appendix E.

Pilot test four was carried out to further refine the investigator's scoring scale. To establish further evidence of scale reliability, the samples were changed. The sample for the normal group was ten students presently attending the University of Oklahoma between the ages of eighteen and twenty-six. The deviant sample was ten trustees from the Oklahoma Department of Corrections Clearwater Community Treatment Center between the ages of eighteen and twenty-six. Scoring procedure was that which appears in Table 2. Analyses of data were then performed, where a one-way ANOVA was calculated to determine significance between groups.

Statistical Design

Data analyses were performed in two phases. Analyses were calculated to establish continuity of statistical treatments between this study and previous Luscher research (Johnson, 1974; Klar, 1961; Scott, 1970). Further statistical analyses were calculated to determine the effectiveness of the investigator's numerical scale.

Analyses were performed in stages. In stage one analysis 8 X 8 frequency matrices were used to cross tabulate frequency of color preference by grade and group. A matrix was constructed for each grade level, each categorical group and the total groups. Frequencies were then employed in the construction of composite weighted matrices reflecting degrees of color preference for each grade, each categorical group and the total

group. The degree of color preference (weighted preference) was calculated by the following formula as indicated by Klar (1959) and Scott (1970).

Knowing the frequency of occurrence of each colour in each position, it is possible to obtain the rank order for each group by weighing as follows:

In 1st position, multiply by factor 8; in second position, by factor 7

3rd	..	..	..	6	4th	..	..	..	5
5th	..	..	..	4	6th	..	..	..	3
7th	..	..	..	2	8th	..	..	..	1

(Scott, 1970, p. 7)

Spearman Rank Correlations were obtained, Rho was calculated to determine the amount of agreement of rank color preference between groups. An obtained Rho of ± 1.00 indicated perfect agreement between groups for rank color preference. The greater the distance between the obtained Rho and 1.00, the less agreement between group choices (Klar, 1959).

H_{01} through H_{04} were tested by using Chi Square tests to determine whether there were significant differences between frequencies of color preferences among groups at each grade level. The analyses were performed according to Klar (1959) and Scott (1969) to establish statistical continuity between previous Luscher research and this investigation as an aid in determining a basis for further validity and reliability studies. Additional analyses involved the treatment of data obtained by the juxtaposition of the numerical scale to the interpretive instructions found in the Luscher Manual. An attempt was made to determine the effectiveness of the investigator's numerical scale in further differentiating between selected adolescent groups.

Hypothesis five was tested using a 3 X 3 factorial between-subjects, design where a two-way analysis of variance was performed (Lindquist, 1953, pp. 207-219; Linton and Gallo, 1975, pp. 145-156). For ease of

calculation the sample size was reduced by random selection to equal cells of $n = 10$. In employing a n of 10 subjects per cell, the power equaled .90 for tests of main effects A and B ($1 - \beta = .90$). Power for the AB interaction was considerably lower (Kirk, 1968, pp. 178-179).

The procedures used in obtaining data, the population and samples employed in the study and the instrumentation used to measure specific variables were discussed. Data were obtained by individualized testing of all subjects. Subjects were 139 eighth, ninth and tenth graders attending schools in two metropolitan Oklahoma school systems within their home communities, after attrition 110 subject profiles were scored. Chapter IV presents analysis and interpretation of obtained data.

CHAPTER IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF THE DATA

Data analyses for this investigation were two fold: (a) data analysis performed according to procedures used by Johnson (1974), Klar (1959) and Scott (1970) in previous Luscher research. These procedures were employed to provide statistical continuity between this study and earlier Luscher research. (b) Data analysis performed to determine effectiveness of the investigator's numerical scoring scale as an instrument for differentiating between selected groups of adolescents.

Analysis as performed by Klar (1959), Johnson (1974) and Scott (1970) involved four sequential procedures prior to computational operations. In stage one, frequency tables were developed from the raw data (see Table 3) to provide a basic framework for all phase I calculations. Frequency tables were constructed for each educational category, reflecting total frequencies of ranked color preference by grade and group. These data are presented in Tables I through T, Appendix F. In the second stage 8 X 8 weighted matrices demonstrating grade or group rank-order color preference (weighted) were developed according to Klar's formula (1959) p. 48 of this study. (Tables U through FF, Appendix F). In the third stage tables reflecting grade or group rank-order color preference were compiled from the weighted matrices (Tables GG through II, Appendix F).

Table 3

Raw Data

Observation	Group (Reg.)	Grade	Color Selection	SumX	C	A	CA	SumX2
1	1	8	51346207	13	0	1	1	12
2	1	8	13465072	13	0	3	3	10
3	1	8	41352607	13	0	0	0	14
4	1	8	35412607	14	0	0	0	15
5	1	8	25341607	14	0	0	0	15
6	1	8	23475160	12	0	1	1	11
7	1	8	13546702	13	0	3	3	10
8	1	8	34152670	14	0	0	0	15
9	1	8	21364507	14	0	0	0	15
10	1	8	31256407	13	0	1	1	12
11	1	8	32165470	12	0	1	1	11
12	1	8	41352607	13	0	0	0	13
13	1	8	13465072	13	0	3	3	10
14	1	8	35412607	14	0	0	0	15
15	1	9	13426705	13	0	0	0	14
16	1	9	54362107	11	0	0	0	10
17	1	9	43561207	10	0	1	1	9
18	1	9	42531267	12	0	0	0	13
19	1	9	43150276	9	0	1	1	8
20	1	9	12534760	13	0	0	0	14
21	1	9	53241607	14	0	0	0	15
22	1	9	15273406	9	0	0	1	9
23	1	9	43256107	12	0	1	1	11
24	1	9	42156307	12	0	1	1	11
25	1	9	15342607	14	0	0	0	15
26	1	9	21340675	13	0	0	0	14
27	1	9	45316207	12	0	0	1	12
28	1	9	13524607	15	0	0	0	17
29	1	9	42351670	13	0	0	0	14
30	1	9	15436207	12	0	1	1	11
31	1	10	12304657	14	0	0	0	15
32	1	10	23465107	12	0	1	1	11
33	1	10	45321607	13	0	0	0	14
34	1	10	32165470	13	0	0	0	14
35	1	10	23145607	16	0	0	0	18
36	1	10	53124607	14	0	0	0	15
37	1	10	41320567	14	0	0	0	15
38	1	10	14325067	16	0	0	0	18
39	1	10	23145607	15	0	0	0	17
40	1	10	13452760	14	0	0	0	15
41	1	10	41350762	11	0	3	3	8
42	1	10	32415607	15	0	0	0	17
43	1	10	31452706	13	0	0	0	14
44	1	10	13254706	13	0	0	0	14

Table 3--Continued

Observation	Group (LD)	Grade	Color Selection	SumX	C	A	CA	SumX2
45	2	8	27130465	8	2	1	3	4
46	2	8	54361720	11	0	2	2	9
47	2	8	51643270	10	1	2	3	7
48	2	8	51723604	10	1	3	4	6
49	2	8	3716524	8	4	3	7	1
50	2	8	27564013	8	2	5	8	1
51	2	8	17250643	8	2	5	7	1
52	2	8	35714206	10	1	1	2	8
53	2	8	27564013	7	2	5	7	0
54	2	8	32150674	12	0	3	3	9
55	2	9	34725610	12	0	3	3	8
56	2	9	53726140	11	0	3	3	8
57	2	9	57421630	10	2	2	4	6
58	2	9	53462017	11	0	2	2	9
59	2	9	74621503	10	3	3	6	4
60	2	9	74621503	10	3	3	6	4
61	2	9	13652074	13	1	1	2	11
62	2	9	13526074	13	0	3	3	10
63	2	9	32150674	11	0	3	3	8
64	2	9	34726150	12	1	1	2	10
65	2	9	53462017	11	0	2	2	9
66	2	9	34657210	8	1	3	4	4
67	2	10	2713	.	.	.	.	.
68	2	10	43126750	13	2	0	2	11
69	2	10	57124036	8	2	3	5	8
70	2	10	75321046	10	3	2	5	5
71	2	10	30654217	7	3	3	6	1
72	2	10	15342607	13	0	0	0	14
73	2	10	27431506	13	2	0	2	11
74	2	10	34526017	14	0	2	2	12
75	2	10	57120436	7	2	3	5	2
76	2	10	32451076	14	0	0	0	15
77	2	10	75321046	10	3	1	4	6

Table 3--Continued

Observation	Group (Predq)	Grade	Color Selection	SumX	C	A	CA	SumX2
78	3	8	74136052	11	3	3	6	5
79	3	8	43526170	10	0	2	2	8
80	3	8	15347206	9	0	1	1	9
81	3	8	13574206	9	0	1	1	8
82	3	8	15732460	9	1	1	2	7
83	3	8	37506412	5	2	6	8	3
84	3	8	52436710	11	0	2	2	9
85	3	8	63125470	12	3	1	4	8
86	3	8	76435201	6	5	1	6	0
87	3	8	75613240	7	3	3	6	61
88	3	8	56120347	6	2	3	5	1
89	3	8	65037412	3	2	6	8	5
90	3	9	51742360	10	1	1	2	8
91	3	9	51734260	9	1	1	2	7
92	3	9	16503472	6	2	4	6	0
93	3	9	16203547	9	2	2	4	5
94	3	9	51742360	8	1	1	2	8
95	3	9	43652017	9	1	2	3	3
96	3	9	71043562	9	4	3	7	2
97	3	9	73546021	9	3	5	8	1
98	3	9	70623145	3	6	3	9	6
99	3	9	54271360	10	0	1	1	9
100	3	10	15436207	12	0	1	1	11
101	3	10	76523401	6	5	4	9	3
102	3	10	14256307	13	0	1	1	12
103	3	10	7164532	5	5	5	10	5
104	3	10	24057316	4	1	3	4	0
105	3	10	30547612	7	2	5	7	0
106	3	10	57304621	6	2	5	7	1
107	3	10	15236470	13	0	1	1	12
108	3	10	34651027	9	1	2	3	6
109	3	10	42630157	9	1	1	2	7
110	3	10	36452170	9	1	1	2	7

Testing of Ho₁ through Ho₆

In the fourth stage of analysis Ho₁ through Ho₄ were tested. Stage four data analyses were performed as prescribed by Klar (1959) and Scott (1970). Statistical computations were computed with SAS data procedures (Barr, Goodnight, Sall and Helwig, 1977). Spearman Rank-Order Correlations were performed to determine the degree of agreement for color choices between and among groups. Secondly, Chi Square tests of significance were calculated to determine statistical significance of differences for color preference between and among groups for each color. Hypotheses Ho₁ through Ho₄ are now stated in statistical form.

Ho₁ There is no significant statistical difference between frequency of color choices among students attending: (a) eighth; (b) ninth; or (c) tenth grade regular classes when ranked color preferences between grades are compared.

Ho₂ There is no significant statistical difference between frequency of color choices among learning disabled students attending: (a) eighth; (b) ninth; and (c) tenth grade learning disability resource classes when ranked color preferences between grades are compared.

Ho₃ There is no significant statistical difference between frequency of color choices among predelinquent adolescents attending: (a) eighth; (b) ninth; or (c) tenth grade alternative education programs when ranked color preferences are compared between grades.

Ho₄ There is no significant statistical difference between frequency of color choice between: (a) regular; (b) learning disabled; and (c) predelinquent adolescents attending education programs in their home community when ranked color preferences are compared.

Spearman Rank-Order Correlation Coefficients computed for Ho₁ through Ho₄ were not statistically significant ($\alpha = .05$) between grade levels among subjects attending regular classes. Statistical significance was obtained between all compared learning disabled and predelinquent samples across grade levels. The statistical significance across grade levels in Ho₁ through Ho₄ did not

effect the null hypotheses, but was indicative of a disagreement between compared groups. As indicated by Rho eighth, ninth and tenth grade subjects attending regular classes were similar populations. Ninth and tenth grade learning disabled subjects were indicated by Rho to be dissimilar groups. Disagreement was demonstrated between subjects attending learning disabilities and regular classes, indicating more dissimilarity than similarity between groups. Statistical significance was indicated between five grade groups within non-regular groups: (a) eighth and ninth grade subjects, attending learning disabilities class; (b) eighth and ninth grade subjects attending LD classes; and (c) all predelinquent subjects. Results indicating statistical significance between these groups indicated fewer similarities in color choices between the compared groups. A decision to accept or reject null hypotheses H_{o1} through H_{o4} was not made at this time, based upon Scott (1970) stated the "null hypothesis cannot be rejected until Chi Square tests of significance between individual colors are computed." (p. 8). Spearman Rank-Order Correlation Coefficients were summarized in Tables 4 through 6. Weighted rank-order color preferences were summarized in Tables 7 and 8. Klar's (1959) procedures for calculating the degree of color preference were presented in Appendix B.

Chi Square tests of significance between colors were computed on H_{o1} through H_{o4} . Obtained Chi Squares for H_{o1} were not significant for regular eighth grade subjects for any color. Chi Squares were not significant for regular ninth and tenth grade subjects for any color except violet. Violet was significant at the $p > .05$ level. Chi Square was not significant between eighth and tenth grade regular subjects. Null hypothesis, H_{o1} was accepted. Summarized Chi Square results were presented in Table 9.

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Table 4

Agreement Between Group Color Preferences Indicated
by Spearman Rank-Order Correlation Coefficients

(Rho): Among Regular Subjects Attending Regular Classes

Group	Grades	Number of Ranks	Color(s) most Different	Difference ²	Rho
Regular	8th-9th	8	Blue, yellow	12	+.86 ^a
Regular	9th-10th	8	Yellow	14	+.84 ^a
Regular	8th-10th	8	Yellow	8	+.91 ^a

^a p < .05

*Significant at or beyond the .05 level.

Table 5

Agreement Between Group Color Preferences Indicated
by Spearman Rank-Order Correlation Coefficients

(Rho): Among Subjects Attending LD Classes

Group	Grades	Number of Ranks	Color(s) most Different	Difference ²	Rho
LD	8th-9th	8	Red	46	.45 ^a
LD	9th-10th	8	Yellow	21	.75 ^a
LD	8th-10th	8	Red	55	.35 ^a

^a p < .05

* Significant at or beyond the .05 level.

Table 6

Agreement Between Group Color Preferences Indicated
by Spearman Rank-Order Correlation Coefficients

(Rho): Difference in Color Preference Among Subjects Attending Alternative Classes

Group	Grades	Number of Ranks	Color(s) most Different	Difference ²	Rho
Predelinquent	8th-9th	8	Red	5	.58 ^a
Predelinquent	9th-10th	8	Black	8	.31 ^a
Predelinquent	8th-10th	8	Black, yellow	46	.45 ^a

* Significant at or beyond the .05 level.

Table 7

Spearman Rank-Order Correlation Coefficient

(Rho) Between Groups

Groups	Number of Ranks	Most Difference	Difference ²	Rho
Regular-LD	8	Black, violet	6	.36 ^a
LD-Predelinquent	8	Green, yellow	42	.50 ^a
Regular-Predelinquent	8	Violet	39	.54 ^a

^ap < .05^a Significant at or beyond the .05 level.

Table 8

Ranked-Order Color Preference for Educational Groups

Group	Position							
	1	2	3	4	5	6	7	8
Regular	Red	Blue	Yellow	Green	Violet	Brown	Gray	Black
Learning Disabled	Violet	Red	Green	Black	Blue	Yellow	Brown	Gray
Predelinquent	Violet	Yellow	Red	Blue	Brown	Black	Green	Gray

Obtained Chi Squares for H_{02} were not statistically significant, indicating similarities of color choice between learning disabled subjects across grade levels. The lack of obtained statistical difference between learning disabled subjects indicated similarity of color choice within the group, H_{02} was accepted. Summarized results for obtained Chi Squares among LD subjects were presented in Table 10.

Obtained Chi Squares for H_{03} were not significant, indicating similarity between color choice across grade levels for predelinquents subjects. Summarized results for predelinquent subjects were presented in Table 11.

Obtained Chi Squares for H_{04} were significant ($\alpha = .05$) indicating differences in color choice between groups. Null hypothesis (H_{04}) was rejected based upon significant differences in color preference obtained for seven colors between regular and learning disabled subjects: gray, blue, green, red, yellow, brown and black. Between learning disabled and predelinquent subjects significance was obtained for four colors: green, red, yellow and brown. Differences in color preference between regular and predelinquent subjects were significant for six colors: gray, blue, red, yellow, brown and black. Chi Square test results between groups are presented in Table 12. No normative data existed for the educational groups studied in this investigation; thus, expected value was calculated according to Klar's (1959) formula.

Color preference differences were largely indicated by differences in first and last choice. Regular subjects chose red first rejecting brown, black and gray. Learning disabled and predelinquent subjects preferred violet, rejecting brown, black, yellow and gray. The preference of

Table 10

Obtained Chi Square for Difference Between
Color Choice Among Learning Disabled Subjects

Grades (8-9)	Color	Chi ^{2a}
	Gray	3.80
	Blue	8.22
	Green	8.42
	Red	8.42
	Yellow	10.57
	Violet	4.87
	Brown	4.86
	Black	7.88
<hr/>		
(9-10)		
	Gray	4.03
	Blue	4.90
	Green	3.04
	Red	10.12
	Yellow	9.17
	Violet	4.16
	Brown	11.98
	Black	7.97
<hr/>		
(8-10)		
	Gray	5.30
	Blue	6.43
	Green	8.08
	Red	8.05
	Yellow	4.50
	Violet	4.50
	Brown	7.90
	Black	8.30

^a p < .05 level

Table 9

Obtained Chi Squares: Difference Between
Color Choice Among Regular Subjects

Grade	Color	Chi ²
(8-9)		
	Gray	4.37 ^a
	Blue	6.03 ^a
	Green	12.56 ^a
	Red	10.31 ^a
	Yellow	4.17 ^a
	Violet	9.18 ^a
	Brown	3.47 ^a
	Black	0.57 ^a
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(9-10)		
	Gray	2.44 ^a
	Blue	4.08 ^a
	Green	8.60 ^a
	Red	7.90 ^a
	Yellow	2.54 ^a
	Violet	16.07 ^a
	Brown	5.67 ^a
	Black	2.67 ^a
<hr/>		
(8-10)		
	Gray	3.59 ^a
	Blue	1.64 ^a
	Green	6.29 ^a
	Red	0.90 ^a
	Yellow	1.84 ^a
	Violet	3.40 ^a
	Brown	7.47 ^a
	Black	4.46 ^a

^a p < .05 level

* Significant at or beyond the .05 level.

Table 11

Obtained Chi Square for Difference Between
Color Choice Among Predelinquent Subjects

Grade (8-10)	Color	Chi ²
	Gray	5.64 ^a
	Blue	10.10 ^a
	Green	7.88 ^a
	Red	7.55 ^a
	Yellow	5.46 ^a
	Violet	11.78 ^a
	Brown	8.69 ^a
	Black	5.53 ^a
(9-10)	Gray	6.30 ^a
	Blue	6.17 ^a
	Green	16.64 [*]
	Red	7.97 ^a
	Yellow	7.44 ^a
	Violet	7.90 ^a
	Brown	6.78 ^a
	Black	9.98 ^a
(8-10)	Gray	3.25 ^a
	Blue	3.83 ^a
	Green	7.97 ^a
	Red	5.80 ^a
	Yellow	3.96 ^a
	Violet	8.17 ^a
	Brown	6.78 ^a
	Black	6.10 ^a

^a p < .05

^{*} Significant at or beyond the .05 level.

Table 12

Obtained Chi Square for Difference
of Color Choice Between Educational Groups

Group	Color	Chi ²
Regular-LD	Gray	21.88 ^{**}
	Blue	17.83 [*]
	Green	15.31 [*]
	Red	16.81 [*]
	Yellow	27.29 ^{**}
	Violet	9.42 ^a
	Brown	14.44 ^{**}
	Black	38.25 ^{**}
LD - Predelinquent	Gray	12.75 ^a
	Blue	11.70 ^a
	Green	16.64 ^{**}
	Red	18.58 ^{**}
	Yellow	14.98 ^a
	Violet	1.94 ^a
	Brown	17.42 ^a
	Black	10.96 ^a
Regular - Predelinquent	Gray	21.58 ^{**}
	Blue	16.78 ^a
	Green	11.69 ^a
	Red	27.16 ^{**}
	Yellow	14.37 ^a
	Violet	8.01 ^a
	Brown	29.54 ^{**}
	Black	34.08 ^{**}

^a p < .05 level

^{*} Significant at or beyond the .05 level.

^{**} Significant at or beyond the .01 level.

Table 13

Results of the ANOVA Comparing Color Scores Obtained
with the Investigator's Numerical Scale Between Grades and Groups

Source	df	SS	MS	F	Pr > F
Group	2	725.40	362.7	8.16	.0006
Grade	2	68.46	34.23	.77	.4661
Interaction	4	371.73	92.93	2.09	.0894
Within	81		44.43		
Total	89				

Table 14

Mean Scores by Grade and Group

Grade	Group	Score
8	Regular	12.87
9	Regular	12.31
10	Regular	14.64
8	LD	4.6
9	LD	7.58
10	LD	8.5
8	Predelinquent	9.4
9	Predelinquent	7.5
10	Predelinquent	8.3

violet by these groups concurs with results obtained by Klar (1959, 1961) and Johnson (1974). Summarized rank-order color preference for each group are presented in Tables GG through II in Appendix F.

Null Hypothesis, H_{06} was tested using a two way, factorial 3 X 3 between-subjects ANOVA. H_{06} statistically stated is as follows:

H_{06} There is no statistical significance difference between numerical scores obtained as measured by the investigator's scoring scale between regular, learning disabled and predelinquent adolescents attending education programs in their home community.

The analysis of variance was significant ($\alpha = .0046$) allowing rejection of H_{06} . The obtained results indicated no significant differences across grade levels. Obtained F of 8.16 (2,81) was significant between groups. Summarized results for the ANOVA were presented in Table 13.

Tables 15 and 16 presented allocated anxieties by grade, group and educational categories. The following differences in allocated anxieties between groups were demonstrated. Regular subjects obtained higher scores with fewer anxieties. Learning disabled subjects obtained higher scores and exhibited fewer anxieties than predelinquent subjects. Predelinquent scores were lower and demonstrated more anxieties than the other two groups.

Obtained means for numerical scores between and within groups were summarized in Table 14. Mean scores were significantly higher for regular subjects than for either predelinquent or learning disabled subjects. Learning disabled subjects obtained lower mean scores than the other compared groups.

Chapter IV has presented data analyses, summarized results and data implications. Chapter V presents the reader with a recapitulation, discussion, conclusions and recommendations resultant to the obtained results of this study.

Table 15

Anxieties by Grade and Group

Number of Anxieties	Grade		
	Eighth	Ninth	Tenth
0	7	11	16
1	11	11	7
2	4	5	3
3	9	9	5
4	0	1	1
5	3	1	3
6	2	0	0

Table 16

Anxieties by Educational Group

Number of Anxieties	Group			Total
	Regular	Learning Disabled	Predelinquent	
0	30	4	0	34
1	10	5	14	14
2	0	7	5	12
3	4	13	6	23
4	0	0	2	2
5	0	3	4	7
6	0	0	2	2

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This investigation was an effort to determine whether (a) the LSCT would differentiate between eighth, ninth and tenth grade subjects attending regular, learning disabilities or alternative classes in their home community. (b) Whether a numerical scale juxtaposed to the interpretive schematics of the Luscher manual differentiate further between selected adolescent groups. Personality configurations were measured by the subject's rank-order color preferences. Numerical scores were obtained by the use of the investigators numerical scale juxtaposed to Luscher's interpretive format.

One hundred and thirty-nine secondary school subjects were individually administered the LSCT. After attrition 110 subject response profiles were interpreted and scored.

Findings

Five hypotheses were stated as the bases for this investigation, each hypothesis has been tested on data obtained during this study. The following results of the tested hypotheses were determined during this investigation.

Hypothesis 1: There is no significant difference among color choices for students attending eighth, ninth, and tenth grade regular classes when ranked color preferences between grades are compared.

This hypothesis was substantiated, there were no significant differences in color preference determined between grade levels among regular subjects as indicated by obtained Chi Squares.

Hypothesis 2: There is no significant difference among color choices for learning disabled students attending eighth, ninth, and tenth grade learning disability resource classes when ranked color preferences between grades are compared.

This hypothesis was accepted, no overall significant differences were found among color preferences as indicated by obtained Chi Squares. Significant statistical difference was, however, obtained for violet between two compared grade levels. Eighth and ninth grade subjects demonstrated slight differences in preference for violet between grade levels; ninth graders chose violet fewer times than did eighth graders.

Hypothesis 3: There is no significant difference among color choices for predelinquent adolescents attending eighth, ninth, and tenth grade alternative education programs when ranked color preferences are compared between grades.

This hypothesis was accepted, no differences between color preferences across grade levels were detected as indicated by obtained Chi Squares.

Hypothesis 4: There is no significant difference among color choices for regular, learning disabled, and predelinquent adolescents attending education programs in their home community when ranked color preferences are compared.

This hypothesis was rejected, significant differences were detected in color preference between two compared groups: (a) regular subjects and learning disabled subjects; (b) regular subjects and predelinquent subjects. Regular and learning disabled subjects demonstrated discrepancies between seven colors. Gray, yellow and black were significant at or beyond the .01 level. Blue, green, red and brown were significant at or beyond the .05 level. Regular and predelinquent subjects demonstrated differences between color preferences for six colors. Gray, red, brown and black

were significant at or beyond the .01 level. Blue and yellow were significant at or beyond the .05 level. Learning disabled subjects demonstrated differences between three colors. Yellow at the .01 level or beyond; violet and brown at or beyond the .05 level.

Hypothesis 5: There is no significant difference among numerical scores as measured by the investigators scale between regular, learning disabled, and predelinquent adolescents attending education programs within their home communities.

This hypothesis was rejected. Statistical significance was obtained between educational groups at the .0046 level indicating effectiveness of the numerical scale to differentiate between groups. No significant differentiation between grade levels was detected.

Summary of Findings and Conclusions

The data analyzed during this investigation indicated that regular subjects, learning disabled subjects and predelinquent subjects exhibited different personality configuration as measured by differences in color selection patterns. The investigator's numerical scale differentiated between educational categories, but not across grade levels. The following specific findings were reached: (a) regular and learning disabled subjects demonstrated more differences between color choices than the other two compared groups. (b) Regular subjects demonstrated less anxieties and higher numerical scores. (c) Regular subjects and predelinquent subjects demonstrated significant differences between groups as indicated by selected color preference and obtained numbers of anxieties. Predelinquent subjects obtained lower numerical scores than did regular subjects and exhibited more anxieties than did the regular subjects. (d) Learning disabled and predelinquent subjects demonstrated fewer differences between groups when the two groups were compared,

indicating more similarities between these two samples. (e) No difference was detected between the selected preference of violet between these three groups as indicated by Chi Squares.

In reference to previously cited literature this investigation reports the following conclusions: (a) Deviant adolescents exhibit different personality configurations than regular subjects as measured by color preferences. This indication concurs with findings obtained by Schaie (1966), Schachtel (1950) and Kopfel and Kelly (1957). (b) As measured by color selection preferences, learning disabled and predelinquent adolescents were symptomatologically similar samples. This finding concurs with Clements' and Peters' (1962) statement that learning disordered, behaviorally disturbed and victims of childhood psychosis were "symptomatologically similar groups." (p. 18) (c) Differences in obtained color scores effected by the investigator's scoring scale indicated that quantitative scoring does have potential for differentiating between educational groups. This finding concurs with suggestions made by Cronbach (1948) and Buck (1957). Both recommended investigation of quantitative scoring of projective tests. (d) Adolescent subjects exhibit a greater preference for violet than normal adult subjects. (e) Learning disabled and predelinquent subjects selected violet as a first or second choice more frequently than did regular subjects. These findings corroborate previous findings by Sproles (1973), Scott (1970), Johnson (1974) and Klar (1966), their research indicated that the greater the disturbance the higher the preference for violet.

In summary, several conclusions were reached. (a) Learning disabled and predelinquent subjects exhibited LSCT patterns different than those exhibited by regular subjects. (b) The LSCT did differentiate

between selected adolescent groups compared in this investigation. (c) The LSCT offers potential as an instrument to detect differences among adolescent groups. (d) The investigator's scale differentiated quantitatively between adolescent groups and should be employed for further Luscher research.

Recommendations for Further Study

Recommendations for further study indicated by the results of this investigation provide implications for special education and related educational disciplines. Future research related to this investigation should employ a larger sample encompassing more grade levels to provide possible differentiation at lower grade levels. The results of this study indicated that the investigator's scale differentiated between educational groups, however, no specific normative data was compiled; further studies should attempt to compile normative data for anxiety and color scores among adolescent groups.

Results indicated by this study make it tantamount that color preferences among adolescents be considered with reference to teaching materials and media design. Recommendations for further study should or might include a study to investigate the effect of color preferences upon learning as related to visual teaching aids.

This study was designed to determine the ability of the LSCT to differentiate between adolescent groups. Further study should consider the possibility of compiling LSCT quantitative normative data within American populations, particularly for adults and preadolescents.

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APPENDIX A

CHARACTERISTICS OF DELINQUENT, LEARNING DISABLED,
EMOTIONALLY DISTURBED ADOLESCENTS AND
CLEMENTS' SYMPTOMOLOGY

Characteristics of Learning Disabled, Emotionally
or Behaviorally Disordered
and Delinquent Adolescents

Traditionally research literature has discussed learning disabled, emotionally disturbed and delinquent adolescents as separate populations. Learning disabled and emotionally disturbed adolescents were, however, considered under the umbrella term of "exceptional" children (Burns, 1976). Delinquents have most frequently been discussed by anthropologists, sociologists, psychiatrists, and psychologists (Bettleheim, 1955; Cohen, 1955; Cloward & Ohlin, 1960; Glueck & Glueck, 1950; Kvaraceus, 1959; Miller, 1970). With the increased impetus of social change agents and agencies, however, there was a concomitant impetus to decipher the delinquency riddle and the effect of delinquency upon the social system. (Bennett, 1960; Conger & Miller, 1967; Joint Commission on Mental Health, 1960; President's Commission, Note 5; National Task Force on Juvenile Delinquency, Note 7). With the catalysts of task forces and social change agencies, an increase in juvenile delinquency research began to yield data which implied a need for concern by educators toward delinquency.

These concerns began to impact special education during the late 1960's (Gagne, 1977). By the middle 1970's, several researchers were investigating relationships between learning disabilities and juvenile delinquency (Holte, 1972; Jordan, 1970; Mesinger, 1977; Murray, 1976; Berman, Note 3; Compton, Note 8; Poremba, Note 2). Characteristics of three exceptional adolescent groups were compared for similarities and differences: (a) learning disabled; (b) behaviorally disturbed; and

(c) delinquent. Clements and Peters (1962) stated "there is considerable overlapping of symptomologic behaviors between the organic behavior syndrome, learning syndrome and some child psychoses (p. 18).

Characteristics of Learning Disabled

Children and Adolescents

Clements and Peters (1962) listed seven symptoms frequently employed by teachers to describe learning disabled children:

1. He seems bright; he is quiet and obedient, but daydreams and can't read.
2. He is high-strung and nervous; his attention is hard to hold.
3. He has frequent temper outbursts, sometimes for no apparent reason.
4. He won't concentrate for more than a few minutes at a time; he jumps from one thing to another, and minds everyone's business but his own.
5. He lacks self-control; he cannot work with other children; he picks on them constantly; he is very disturbing in the classroom and worse on the playground.
6. He does not work to capacity; he is not learning to read or work with numbers, but has a good vocabulary and uses words correctly.
7. He thinks, speaks and moves so slowly and is a very poor reader; in many ways he seems very intelligent.

(Clements & Peters, p. 19)

Clements (1966) in a report for U.S. Department of Health, Education and Welfare, enumerated the following common categories of signs and symptoms of learning disabled children (see Appendix AA for complete list).

1. Spotty intellectual deficits
2. Deficit expressive motor development (e.g.) below C.A. on drawing tests and/or geometric figure reproduction
3. Poor group test performance
4. Discrepant performance on the Weschler subtests
5. Impaired perception and concept formation
6. Neurological indicators and neurological soft signs
7. Disorders of speech and communication
8. Disorders of motor function
9. Academic achievement and adjustment
10. Disorders of thinking process
11. Physical characteristics
12. Emotional characteristics
13. Sleep characteristics
14. Variations in physical development
15. Social deviance
16. Personality variations
17. Disorders of attention and concentration

(p. 6-11)

Clements (1966) stated that these behaviors usually occurred in clusters rather than in isolation. He cited ten characteristics most frequently referenced by researchers, teachers and parents:

1. Hyperactivity
2. Perceptual-motor impairments
3. Emotional lability

4. General orientation defects
5. Disorders of attention (e.g. short attention span, distractibility)
6. Impulsivity
7. Disorders of memory and thinking
8. Specific learning disabilities in reading, arithmetic, writing and spelling
9. Disorders of speech and hearing
10. Equivocal neurological signs and electroencephalographic irregularities

Strauss & Lehtinen (1947) listed the following behavioral characteristics as symptomatic of learning disabilities: (a) perceptual disorders; (b) perseveration; (c) conceptual disorders; (d) behavioral disorders; (e) neurological soft signs; (f) no previous history of mental retardation. McCarthy and McCarthy (1969) employed Kirk's (1962) definition of learning disabilities:

A learning disability refers to a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural or instructional factors. (Kirk & Bateman, p. 73)

Vallet (1969) cited the following characteristics of children with learning disabilities: (a) repeated academic failure; (b) motivational deficits; (c) anxiety; (d) emotional lability; (e) behavior discrepant with existing evaluation and (f) lag between anticipated performance and actual performance.

Wilcox (1970) listed the following characteristics of learning disabled adolescents: hyperactivity; perceptual motor impairments; emotional lability; general coordination deficits; attention disorders; impulsivity; academic deficits in reading, arithmetic, writing and spelling; disorders of speech and hearing; and neurological soft signs. Wilcox cited the following characteristic manifestations of learning disabilities in adolescents: always late; tardy for seemingly no reason; demanding of everyone's time; inappropriate social interactions; illegible handwriting; moody; daring; poorly organized; truant; and academic lags. (Wilcox, 1970). Hayes (1974) in a book designed for teenagers, described the following as traits for which adolescents with learning disabilities need guidelines: maturational lag; deficits in basic reading skills; spelling deficits; and written expression deficits.

Dreshler (1978) discussed four performance deficits which characterized secondary learning disabled adolescents: academic cognitive deficits; deficit skills for independent functioning; deficit personal-social skills; and deficit perceptual motor factors. Deficit skills of independent functioning which Dreshler (1978) addressed included: test-taking skills; organizational skills; study skills; problem solving skills; and information evaluation. Personality and social skill deficits which characterized learning disabled adolescents included any or all of the following traits: overdependence on adults, disorganized behavior, and erratic personal interactions.

Siegel (1974) described social behaviors of learning disabled adolescents as being characterized by impulsivity, low self-esteem, suggestibility or gullibility, low frustration thresholds, and tendencies toward

1971). The above comments by Rothman (1971) summarize frequent descriptions of disturbed adolescents.

Bennett (1960) enumerated and discussed the following behavioral characteristics of behaviorally disordered children: aggressive, truant, restless, enuresis, and the running away syndrome. Bennett also discussed primary characteristics which seemed to precede overt behavior patterns; enuresis, hyperactivity, thumb-sucking, pilfering, lability and academic lag.

Ackerson (1931) was significantly ahead of his time, via ex post facto and on going research he identified the following "personality characteristics" and conduct traits as being common behaviors among behaviorally disordered children: immaturity, restlessness, comprehension problems, irritability, distractable, lability, poor memory, daydreaming, poor motor control, stealing, fighting, enuresis, truancy, temper tantrums, gullibility, incorrigibility, and nervous habits. Ackerson also cited academic deficits in reading and Gestalt performance.

A second aspect of Ackerson's work reflected his perception of behavioral disorders and delinquent behavior as synonymous syndromes. Ackerson, concerned with the effect of maturation upon specific behaviors, identified behaviors which decrease or increase with age. Problems identified as increasing with age were lying, stealing, truancy and poor self concept. Problems identified as decreasing with age were hyperactivity and distractability. Baker (1935) cited the same basic problems which Bennett identified, but emphasized deficit academic achievement when academic performance was discrepant with potential achievement. Daughton and Fix (1978) identified five behavioral syndromes which indicated behavior disturbances proceeding from learning disabilities to

delinquency syndromes.

Mauser (1974) cited the following characteristics of learning disabled adolescents: low self concept; low frustration tolerance; minimal brain dysfunction; delinquent tendencies; and academic lags. Brutton (1974) cited the following as possible and frequent behavioral characteristics of learning disabled adolescents: lying, stealing, low self-esteem, scatters in learning achievement, inconsistency in maturation, poor adaptation to new situations, a lack of resourcefulness, poor problem-solving skills, and ineffective identity. Brutton was concerned that professionals see these traits as symptoms of trouble, not symptoms of laziness or indifference.

Gordon (1966) described the learning disabled adolescent as an adolescent who manifested normal adolescent changes in extreme form, demonstrating any or all of the following symptoms: demanding of everyone's time, socially inept, academic lagging, and low self concept. Burns (1976) discussed emotional problems among learning disabled adolescents as they related to potential delinquent behavior. The following emotional problems were enumerated as characteristic of the learning disabled adolescent: anti-social behavior; distractable; insecurity; and low self concept.

Characteristics of Behaviorally

Disturbed Adolescents

Behaviorally disordered adolescents frequently spend more time out of the peripheral realms of society than within the social system, behaviors exhibited by them make them prime targets of rejection (Rothman,

psychotic syndrome among children. Daughton and Fix (1978) enumerated the behaviors on a continuum.

Characteristics of Juvenile Delinquents

Delinquent behavior in this study was employed to designate a non-unitary behavior pattern rather than the legal definition. Previous delinquency research has reflected a preponderance of studies in which the legal rather than the behavioral definition was the major criterion employed in defining the stated population (Clements, 1960; Glueck & Glueck, 1950; Kvaraceus, 1959; Wirt & Briggs, 1959). Current research reflected a trend which suggested viable delinquency research must employ a behavioral definition to identify the delinquent before he/she exhibited delinquent traits of such magnitude that adjudication occurred (Bennett, 1960; Clements, 1960; Gagne, 1978; Hooke, 1966; Mukerjee, 1973).

Several investigators have found that most delinquent behavior occurred in youth who had met school failure either behaviorally or academically (Berman, 1974; Bennett, 1960; Clements, 1960; Elliot & Voss, 1974; Elliot, 1966; Compton, 1974; Friedman, 1974; Flew, 1973; Glueck & Glueck, 1953; Kvaraceus, 1957; Tarnapol, 1970; West, 1969; Wirt & Briggs, 1959). A concomitant variable which has pervaded most delinquent behavior patterns was a specific reading (Ardoff, 1972; Peterson, 1971; Rabinovitch, 1956, 1959; Tarnapol, 1970) or learning disability (Berman, 1974; Compton, 1958; Peterson, 1971; Poremba, 1974).

A third frequently cited behavior within the delinquency syndrome was truancy (Cohen, 1955; Figlio, 1977; Glueck & Glueck, 1950; Hathaway & Monachesi, 1954; Wirt & Briggs, 1955; Williams & Gold, 1972; West, 1969;

Hooke, 1968). Truancy was the second most frequent offense for which delinquents were adjudicated (Critchley, 1968; Glueck & Glueck, 1953). Ex post facto research identified truancy second only to school failure as a common factor in delinquency. Annually, 1,000,000 adolescents dropped out of school. One in three dropouts later had contact with the police in their community (Mesinger, 1977). The research relating delinquent behavior and neurological dysfunction was divided. Tarnapol, 1970; Berman, 1974; Cordon, 1966, 1974, among others, concluded that many delinquent behavior patterns include minimal brain dysfunction. Mesinger (1977) reported 92.4% of committed delinquents in Virginia had been referred for neurological evaluations. Neurological soft signs indicated by behavior syndromes have been significantly higher among delinquents than nondelinquents (Berman, 1974; Flew, 1973; Frostig, 1974; Gordon, 1966; 1974; Hartlage & Hartlage, 1974; Poremba, 1974; Stott, 1960). Critchley (1968) concluded that there were reading lags but not neurological deficits. The delinquent was frequently reported to exhibit personality traits reflecting deviant patterns. Homogeneity of trait patterns have not been reported (Stott, 1960). However, common variables have been identified by numerous researchers. Bennett (1960) cited aggression, lying, hostility, stealing, low self concept, compulsivity, defiant behavior and maliciousness. Ruth Topping (1941), in describing aggressive delinquents, enumerated the following common behaviors: violence, aggressive speech, low self image and an indifference to the consequences of their inappropriate acts. Personality clusters and background factors of delinquent behavior were factor analyzed and reported by Peterson, Quay, et al (1958). Quay (1964) factor analyzed the case histories of

129 incarcerated delinquents for 29 behavior traits. Quay reported the following four common trait clusters: socialized subcultural; unsocialized psychopaths; disturbed neurotics and immaturity. These clusters were similar to those isolated by Hewitt & Jenkins (1946) and Peterson, Quay, et al (1958). Other factor analyses of the delinquent syndrome exhibiting similar clusters were reported by Kleinbaum (1972), Hewitt and Jenkins (1946).

Wirt & Briggs (1959) concluded the following traits relevant to the delinquency syndrome.

1. Delinquents exhibited higher drop out rates from school.
2. Delinquents exhibited fewer types of social contacts.
3. The delinquents tended to associate with delinquents.
4. Delinquents were more excitable.
5. Delinquents exhibited poor judgement in social situations.
6. Delinquents exhibited personality disorders.

Donald (1964) found delinquents exhibited significantly lower self concept and were identified by teachers as "poor risks" with low self concept. Hooke (1966) concluded that a large percentage of delinquents were externally controlled, while nondelinquents were internally controlled (Glueck & Glueck, 1950).

Delinquency studies, regardless of the theoretical orientation of deviance, have identified several traits commonly found within delinquent adolescents. Among those most frequently cited in the literature are the following (all reported symptoms were tabulated for frequency).

1. School failure
2. Average or above average intelligence
3. Impulsivity
4. Compulsivity
5. Defiance
6. Deficit perceptual motor development
7. Reading deficits
8. Poor social adjustment
9. Truancy
10. Running away
11. Identified by teachers as high risk
12. Lying
13. Cheating
14. Aggressive tendencies
15. Learning discrepancy
16. Disruptive behavior syndrome
17. Conduct disorder
18. Rejects authority
19. Discrepant maturational pattern
20. Peer follower
21. Anxiety traits
22. Externally dependent

In summary delinquent behaviors consisted of overt acting out behaviors which reflected internal dysfunction and externally controlled behaviors (Berman, 1974; Donald, 1964; Compton, 1974; Conger & Miller, 1966; Glueck & Glueck, 1950; Poremba, 1974; Wirt & Briggs, 1959). In comparing behavioral traits of learning disabled, behaviorally disordered and delinquent syndromes, a frequency of symptoms was tallied for each major trait area and categorical group of adolescents (see Table A). From Table A it can be seen that symptomologically there are few, if any, differences among groups. Data reflected by research studies in adolescent psychosis were neither reported nor correlated in the frequency chart.

TABLE A

Summary of Symptoms by Authors

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
A. Test Performance Indicators	Poremba	x		x
	Berman	x		x
1. Spotty or patchy intellectual deficits. Achievement low in some areas; high in others.	Glueck			x
	Cohen	x		x
2. Below mental age level on drawing tests (man, house, etc.).	Clements & Peters	x		
	Clements	x		
	Frostig	x		x
3. Geometric figure drawings poor for age and measured intelligence.	Kvaraceus			x
	Gordon			x
4. Poor performance on block design and marble board tests.	Kronich	x		
	Quay		x	
	Quay (1964)		x	x
	Compton	x		x
5. Poor showing on group tests (intelligence and achievement) and daily classroom examinations which require reading.	Fieldhusen			x
	Ackerson		x	
	Topping			x
	Bennett	x	x	x
	Lerner	x		
	Wirt & Briggs			x
	Hathaway & Monachesi			x
	Moore			x
	Cloward & Ohlin			
	Peterson	x		x

Table A (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
	Hooke			x
	Rothman			x
	West			
	Alhstrom			x
	Bettelheim		x	x
	Brownell			x
	Bachara	x		x
	Cantrell	x	x	x
	Conger			x
	Cummings		x	
B. Impairments of Perception and Concept-formation	Bender	x		x
	Koppitz			
1. Impaired discrimination of size.	Frostig	x		x
	Berman			
2. Impaired discrimination of right-left and up-down.	Clements	x		
	Clements & Peters			
3. Impaired tactile discrimination.	Lerner			
4. Poor spatial orientation.				
5. Impaired orientation in time.				
6. Distorted concept of body image.				

Table A. (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
7. Impaired judgment of distance.				
8. Impaired discrimination of figure-ground.				
9. Impaired discrimination of part-whole.				
10. Frequent perceptual reversals in reading and in writing letters and numbers.				
11. Poor perceptual integration. Child cannot fuse sensory impressions into meaningful entities.				
C. Specific Neurological Indicators	Rabinovitch	x		x
	Quay		x	x
1. Few, if any, apparent gross abnormalities.	Tarnapol	x		x
	Clements	x		
2. Many "soft," equivocal, or borderline findings.	Glueck & Glueck			x
3. Reflex assymetry frequent.	West			x
4. Frequency of mild visual or hearing impairments.	Berman	x		x
	Poremba	x		x
5. Strabismus.	Hewitt & Jenkins			
6. Nystagmus.			x	x

Table A (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
7. High incidence of left, and mixed laterality and confused perception of laterality.	Hartlage & Hartlage	x		x
	Lerner	x		
	Jordon	x		x
8. Hyperkinesis.	Ackerson	x		x
9. Hypokinesis.	Levy	x		x
10. General awkwardness.	Bingley		x	x
11. Poor fine visual-motor coordination.	Bradley		x	x
	Cummings		x	x
D. Academic Achievement and Adjustment (Chief complaints about the child by his parents and teachers)	Tarnapol	x		x
	Flew	x		x
	Berman	x		x
	Compton	x		x
	Gordon	x		x
1. Reading disabilities.	Hartlage	x		x
2. Arithmetic disabilities.	Glueck			x
3. Spelling disabilities.	Rhodes		x	
4. Poor printing, writing, or drawing ability.	Hooke			x
	Donald			x
5. Variability in performance from day to day or even hour to hour.	Mukerjee			x
	Bryant	x		
	Petersen	x		x
6. Poor ability to organize work.	Moore			x
	Aichorn			x

Table A. (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
7. Slowness in finishing work.	Alhstrom et al			x
8. Frequent confusion about instructions, yet success with verbal tasks.	Haring & Phillip		x	
	McCarthy & McCarthy	x		
	Brutten	x		x
	Strauss & Lehtiner	x		x
	Baker		x	x
	Glueck			x
	Beck			x
	Stott			x
	Ardoff			x
	Thurston et al			x
	Cantrell	x	x	x
	Cloward & Ohlin			x
	Cohen			x
	West			x
E. Physical Characteristics	Clements		x	x
	Hewitt		x	
1. Excessive drooling in the young child.	Sheldon			x
2. Thumb-sucking, nail-biting, head-banging, and teeth-grinding in the young child.	Glueck			x

Table A (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
3. Food habits often peculiar.				
4. Slow to toilet train.				
5. Easy fatigability.				
6. High frequency of enuresis.				
7. Encopresis.				
F. Emotional Characteristics	Ackerson		x	
	Alstrom & Havighurst			x
1. Impulsive.	Baker		x	x
2. Explosive.	Rhodes		x	
3. Poor emotional and impulse control.	Peterson et al		x	
4. Low tolerance for frustration.	Quay		x	
	Bennett		x	
5. Reckless and uninhibited; impulsive then remorseful.	Topping			x
	Kleinbaum			x
	Beck		x	x
	Benning et al		x	x
	Bingley		x	x
	Bender		x	x
	Bettleheim		x	
	Bowlby			x
	Burns	x		
	Cowen	x		
	Cantrell	x		
	Cohen		x	x
	Cummings		x	

Table A. (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
G. Relationship Capacities	Baker	x		
	Bryant	x		
1. Peer group relationships generally poor.	Clements & Peters	x		
2. Overexcitable in normal play with other children.	Clements	x		
3. Better adjustment when playmates are limited to one or two.	Bender		x	
	Bower		x	x
	Glueck & Glueck		x	
4. Frequently poor judgment in social and interpersonal situations.				
5. Socially bold and aggressive.				
6. Inappropriate, unselective, and often excessive displays of affection.				
7. Easy acceptance of others alternating with withdrawal and shyness.				
8. Excessive need to touch, cling, and hold on to others.				

Table A. (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
H. Characteristics of Social Behavior	Bender		x	x
	Bader	x		
	Bower		x	
1. Social competence frequently below average for age and measured intelligence.	Boynton			x
	Cantrell	x	x	x
2. Behavior often inappropriate for situation, and consequences apparently not foreseen.	Glueck & Glueck			x
3. Possibly negative and aggressive to authority.				
4. Possible antisocial behavior.				
I. Variations of Personality	Aichorn			x
	Kleinbaum			x
1. Overly gullible and easily led by peers and older youngsters.	Oakland			x
	Bower		x	
	Boynton			x
2. Frequent rage reactions and tantrums when crossed.	Cantrell	x	x	x
	Glueck			x
3. Very sensitive to others.	Conger			x
4. Excessive variation in mood and responsiveness from day to day and even hour to hour.	Cummings		x	

Table A. (continued)

Signs and Symptoms	Author	Categorical Orientation		
		Learning Disability	Behavior Disorders	Delinquent
5. Poor adjustment to environmental changes.				
6. Sweet and even tempered, cooperative and friendly (most commonly so-called hypokinetic child).				
J. Disorders of Attention and Concentration	Bower		x	
	Clements	x		
	Bennett		x	x
1. Short attention span for age.	Frostig	x		x
2. Overly distractible for age.	Lerner	x		
3. Impaired concentration ability.	Boynton			x
	Conger			x
4. Motor or verbal perseveration.	West			x
5. Impaired ability to make decisions, particularly from many choices.				

(Adapted from Clements, 1966)

CLEMENTS' SYMPTOMOLOGY

Symptomatology - Identification of the Child
With Learning Disabilities

In a search for symptoms attributed to children with minimal brain dysfunctioning, over 100 recent publications were reviewed.

Many different terms were used to describe the same symptom, e.g., excessive motor activity for age might be referred to as any one of the following: hyperactivity, hyperkinesis, organic drivenness, restlessness, motor obsessiveness, fidgetiness, motor disinhibition, or nervousness.

A large number of terms were too broad for other than limited value, e.g., "reading ability two grade levels below grade placement." A few are mentioned one time only, e.g., "inclined to have fainting spells." Others are too general (or judgmental) to classify, e.g., "often good looking." Opposite characteristics are common: "physically immature for age"--"physically advanced for age"; "fearless"--"phobic"; "outgoing"--"shy"; "hyperactive"--"hypoactive."

These examples represent some of the difficulties encountered in developing a scheme for classification of the symptoms, and indicate the variety of syndromes contained within the primary diagnosis of minimal brain dysfunctioning. The following represents an attempt to classify some of the descriptive elements culled from the literature.

PRELIMINARY CATEGORIES OF SIGNS AND SYMPTOMS

A. Test Performance Indicators

1. Spotty or patchy intellectual deficits. Achievement low in some areas; high in others.
2. Below mental age level on drawing tests (man, house, ets.)
3. Geometric figure drawings poor for age and measured intelligence.
4. Poor performance on block design and marble board tests.
5. Poor showing on group tests (intelligence and achievement) and daily classroom examinations which require reading.
6. Characteristic subtest patterns on the Wechsler Intelligence Scale for Children, including "scatter" within both Verbal and Performance Scales; high Verbal--low Performance; low Verbal--high Performance.

B. Impairments of Perception and Concept-formation

1. Impaired discrimination of size.
2. Impaired discrimination of right-left and up-down.
3. Impaired tactile discrimination.
4. Poor spatial orientation.
5. Impaired orientation in time.
6. Distorted concept of body image.
7. Impaired judgment of distance.
8. Impaired discrimination of figure-ground.
9. Impaired discrimination of part-whole.
10. Frequent perceptual reversals in reading and in writing letters and numbers.
11. Poor perceptual integration. Child cannot fuse sensory impressions into meaningful entities.

C. Specific Neurologic Indicators

1. Few, if any, apparent gross abnormalities.
2. Many "soft", equivocal, or borderline findings.
3. Reflex asymmetry frequent.
4. Frequency of mild visual or hearing impairments.
5. Strabismus.
6. Nystagmus.
7. High incidence of left, and mixed laterality and confused perception of laterality.
8. Hyperkinesis.
9. Hypokinesis.
10. General awkwardness.
11. Poor fine visual-motor coordination.

D. Disorders of Speech and Communication

1. Impaired discrimination of auditory stimuli.
2. Various categories of aphasia.
3. Slow language development.
4. Frequent mild hearing loss.
5. Frequent mild speech irregularities.

E. Disorders of Motor Function

1. Frequent athetoid, choreiform, tremulous, or rigid movements of hands.
2. Frequent delayed motor milestones.
3. General clumsiness or awkwardness.
4. Frequent tics and grimaces.
5. Poor fine or gross visual-motor coordination.
6. Hyperactivity.
7. Hypoactivity.

F. Academic Achievement and Adjustment (Chief complaints about the child by his parents and teachers)

1. Reading disabilities.
2. Arithmetic disabilities.
3. Spelling disabilities.
4. Poor printing, writing or drawing ability.

5. Variability in performance from day to day or even hour to hour.
6. Poor ability to organize work.
7. Slowness in finishing work.
8. Frequent confusion about instructions, yet success with verbal tasks.

G. Disorders of Thinking Process

1. Poor ability for abstract reasoning.
2. Thinking generally concrete.
3. Difficulties in concept-formation.
4. Thinking frequently disorganized.
5. Poor short-term and long-term memory.
6. Thinking sometimes autistic.
7. Frequent thought perseveration.

H. Physical Characteristics

1. Excessive drooling in the young child.
2. Thumb-sucking, nail-biting, head-banging, and teeth-grinding in the young child.
3. Food habits often peculiar.
4. Slow to toilet train.
5. Easy fatigability.
6. High frequency of enuresis.
7. Encopresis.

I. Emotional Characteristics

1. Impulsive.
2. Explosive.
3. Poor emotional and impulse control.
4. Low tolerance for frustration.
5. Reckless and uninhibited; impulsive then remorseful.

J. Sleep Characteristics

1. Body or head rocking before falling into sleep.
2. Irregular sleep patterns in the young child.
3. Excessive movement during sleep.
4. Sleep abnormally light or deep.
5. Resistance to naps and early bedtime, e.g., seems to require less sleep than average child.

K. Relationship Capacities

1. Peer group relationships generally poor.
2. Overexcitable in normal play with other children.
3. Better adjustment when playmates are limited to one or two.
4. Frequently poor judgment in social and interpersonal situations.
5. Socially bold and aggressive.

6. Inappropriate, unselective, and often excessive displays of affection.
7. Easy acceptance of others alternating with withdrawal and shyness.
8. Excessive need to touch, cling and hold on to others.

L. Variations of Physical Development

1. Frequent lags in developmental milestones, e.g., motor, language, etc.
2. Generalized maturational lag during early school years.
3. Physically immature; or
4. Physical development normal or advanced for age.

M. Characteristics of Social Behavior

1. Social competence frequently below average for age and measured intelligence.
2. Behavior often inappropriate for situation, and consequences apparently not foreseen.
3. Possibly negative and aggressive to authority.
4. Possibly antisocial behavior.

N. Variations of Personality

1. Overly gullible and easily led by peers and older children.
2. Frequent rage reactions and tantrums when crossed.
3. Very sensitive to others.
4. Excessive variation in mood and responsiveness from day to day and even hour to hour.
5. Poor adjustment to environmental changes.
6. Sweet and even tempered, cooperative and friendly (most commonly the so-called hypokinetic child).

O. Disorders of Attention and Concentration

1. Short attention span for age.
2. Overly distractible for age.
3. Impaired concentration ability.
4. Motor or verbal perseveration.
5. Impaired ability to make decisions, particularly from many choices.

Several authors note that many of the characteristics tend to improve with the normal maturation of the central nervous system. As the child matures, various complex motor acts and differentiations appear or are more easily acquired.

Variability beyond that expected for age and measured intelligence appears throughout most of the signs and symptoms. This, of course, limits predictability and expands misunderstanding of the child by his parents, peers, teachers, and often the clinicians who work with him.

Ten characteristics most often cited by the various authors, in order of frequency:

1. Hyperactivity.
2. Perceptual-motor impairments.
3. Emotional lability.
4. General coordination deficits.
5. Disorders of attention (short attention span, distractibility, perseveration).
6. Impulsivity.
7. Disorders of memory and thinking.
8. Specific learning disabilities:
 - a. Reading
 - b. Arithmetic
 - c. Writing
 - d. Spelling
9. Disorders of speech and hearing.
10. Equivocal neurological signs and electroencephalographic irregularities.

The "sign" approach can serve only as a guideline for the purpose of identification and diagnosis.

The protean nature of the disability is the obvious conclusion from the approach to symptomatology and identification taken above.

The situation, however, is not as irremediable as it might appear. Order is somewhat salvaged by the fact that certain symptoms do tend to cluster to form recognizable clinical entities. This is particularly true of the "hyperkinetic syndrome," within the broader context of minimal brain dysfunctioning. The "hypokinetic syndrome," primary reading retardation, and to some extent the aphasia, are other such examples.

Recognition and acceptance of these specific symptom complexes as

subcategories, within the general category of minimal brain dysfunctioning, would facilitate classification and the development of appropriate management and education procedures.

(Clements, 1966)
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APPENDIX B

PREVIOUS LÜSCHER DATA

TABLE B
THE EIGHT COLORS

	Objective Meaning	Preference Meaning	Rejection Meaning
0 Grey	unexcitable, lacks sympathetic participation	Refuses to participate, reserved, careful, indirect, non-committal, in order to protect himself from exciting stimuli.	Eager to participate in everything, craves new experiences, mixes readily and feels competent, would like to exhaust all possibilities in order to protect himself from exciting stimuli, irritable.
1 Blue	quiet, sensitive	Need for love; longs for a complete enduring union; yearns for sensitive devotion, quiescence, and affectionate protection.	Antagonism toward devotion, sensitive, pretends to be sober-minded and unsentimental, but really is impulsive and unstable. Self-defense and lack of sensitive devotion are due to his unrealistic claim for affection, resulting in a lack of patience, concentration, and attachments.
2 Green	stability, determination	Defensive, has strong drive to assert himself, wants to protect himself in order to be able to win recognition, refuses to be influenced.	Elusive; wishes to free himself of the oppression he senses when facing opposition in order to assert himself in a new and more suitable position; unstable.

Table B (continued)

	Objective Meaning	Preference Meaning	Rejection Meaning
3 Red	intensity	Emotional, offensive excitement, intense drive, urge to conquer.	Paralyzed, fears excitement, dreads disputes because he feels inferior, harbors an intense desire for protection, feels helpless in his situation.
4 Yellow	cheerfulness	Expectation, hopes new endeavors will offer escape and thereby solve his problems.	Self-protection, strives for security, concentration, self-composure.
5 Violet	uncertain, undetermined, noncommittal, not obliging	Proceeds cautiously, willing to participate when not required to commit himself.	Seeks pure and dependable relationships and results, critical.
6 Brown	comfortable, rootage and security in crowds	Strives for rootage and security in simplicity, in the primitive and in crowds (symbolizes sensuousness, familiarity and possession).	Would like to detach himself from the crowd and display his distinguishing characteristics in order to be esteemed and appreciated by others and thereby inflate his self-confidence; strives for higher standards.
7 Black	final, unchangeable, fundamental	Excessively demanding nature, discredits everything except his unlimited wants; protests in fear of being misunderstood.	Refuses to commit himself in order to avoid setting stereotyped behavior patterns, craves independence.

(Klar, 1961, p. 18)

TABLE C
 ABNORMAL COLOR POSITIONS

	1st	2nd	3rd	4th	5th	6th	7th	8th
Red				x	x	x	x	x
Blue					x	x	x	x
Green	x				x	x	x	x
Yellow	x					x	x	x
Violet	x	x						x
Gray	x	x	x	x				
Brown	x	x	x	x				x
Black	x	x	x	x				

(Scott, 1970, p. 32)

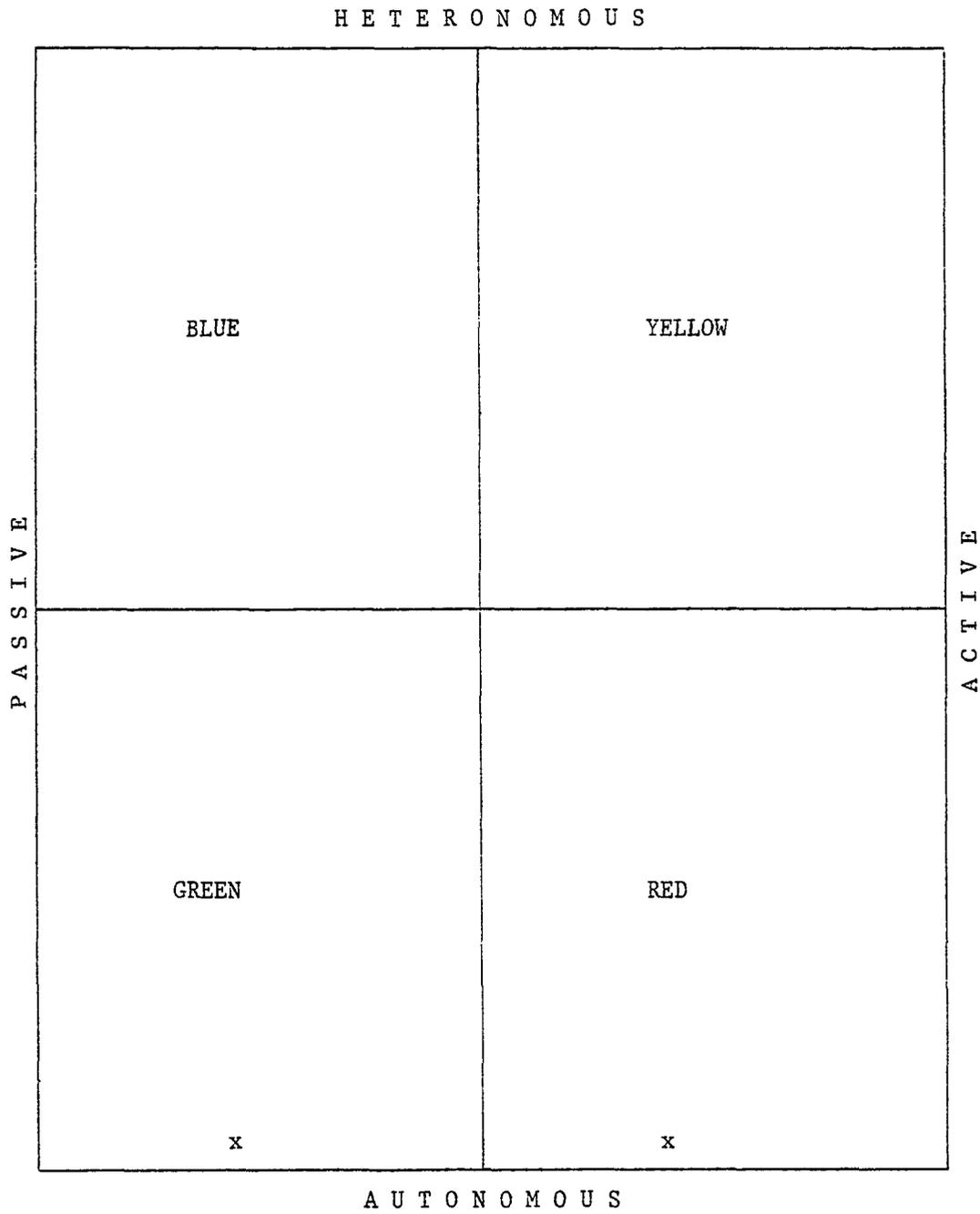
Personality Cube

The original Luscher Color Test (1949, cited in Scott, 1969) consists of seven color plates, containing seventy-three colors. According to Luscher, each color reflects a physiologically, biologically oriented need. Klar designed a personality cube to explicate Luscher's underlying theory of physiological needs and their relationship to the concepts of autonomous-heteronomous; active-passive (see Appendix B, Figure 1) (cited in Johnson, 1974). After looking at Figure 1, you can understand Luscher's personality cube by sequentially proceeding as follows:

1. Look at Figure 1 and imagine that you are looking down on the top surface of a four colored cube. The cube is composed of four equally colored columns, you are now looking at the tops of these columns. The cube cannot be moved, but it can rotate on a central axis in any direction. The cube is your personality.
2. Notice that you are perfectly balanced and can rotate in any direction with equal ease.
3. Now feel causative (autonomous), and pull the autonomous edge (x) toward you. You will notice that you begin to see the hidden verticle side of autonomous which is colored red to the right and green to the left. At the same time you will notice that the heteronomous side of blue-yellow begins to recede in the distance. Notice the more you rotate the green-red side toward you, the more you sacrifice the seeing of the blue-yellow portion of the cube. Now continue to rotate the green-red side upward until it forms a perfect green-red square. You are now completely autonomous, but in becoming so, you have had to completely reject blue-yellow (your heteronomy). In effect, you have cut off all feedback from the outside world.
4. There is a problem. To be completely autonomous, there must be an equal balance between active-passive and you are being very active in rotating

the cube. Your autonomous personality is very active. Let the cube return to its balanced position.

5. Since you are an autonomous-active personality, pull the outer red corner (y) toward you and at the same time rotate the verticle red edge autonomous-active upward. You will begin to see a figure that is largely red in the center, with a verticle yellow stripe to the right and a verticle green stripe to the left, at the top you will notice a small diamond patch of blue which recedes in the distance. Notice that the more you become autonomous-active, the more you sacrifice blue (the heteronomous-passive sector of your personality). As an autonomous-active note how you maintain the active side of yellow; you draw upon yellow's activity and expansiveness. You also maintain the autonomous side of green and thus can exercise a certain amount of self-control. However, you have totally rejected the blue column. The price you have paid for being a total autonomous-active is the loss of interpersonal relationships, along with losing the ability to relax and enjoy yourself.
6. It is unlikely that you are equally balanced between autonomous and active. Do you feel more causative than active? Then rotate slightly toward green. If you feel more active than causative, then rotate slightly toward yellow. Let the cube return to a balanced position.
7. Practice rotating the cube and notice that, by the same degree, the opposite of what you choose is necessarily rejected. Remember that the cube can rotate in any direction, i.e., not just by individual sides or edges. (Johnson, 1974, pp. 50-52)



(Klar, 1971)

FIGURE 1 GRAPHIC REPRESENTATION OF KLAR'S PERSONALITY CUBE

Calculating the Degree
of Color Preference

Calculation of the degree of color preference was computed according to Klar (1959) and Scott (1970). (A) Weighted ranked color preference was calculated for each color between groups in the following manner:

1. Group rankings were placed in a summary box.

Example:

Rank	1	2	3	4	5	6	7	8
Group A	red	blue	green	yellow	grey	violet	brown	black
Group B	blue	red	violet	yellow	green	brown	grey	black

2. Difference between selections was determined.

Example:

Rank	1	2	3	4	5	6	7	8
Group A	red	blue	green	yellow	grey	violet	brown	black
Group B	blue	red	violet	yellow	green	brown	grey	black

difference 1 1 3 0 2 1 2 0 $\sum d = 10$

difference² 1 1 9 0 4 1 4 0 $\sum d^2 = 20$

3. Spearman Rho was computed.

Example:
$$\text{Rho} = 1 - \frac{6(\sum d^2)}{n(n^2-1)}$$

$$n = \# \text{ of ranks}$$

$$\text{Rho} = 1 - \frac{6(20)}{504}$$

$$\text{Rho} = 1 - .2380$$

$$\text{Rho} = .7619$$

(Adapted, Scott, 1970, p.8)

APPENDIX C

LETTERS OF PERMISSION FOR STUDY
AND REPRODUCTION OF MATERIAL



University of
Arkansas
for Medical
Sciences

CHILD STUDY CENTER

June 19, 1978

Ms. Sheila Suliin
Department of Special Education
Education Building 324A
University of Oklahoma
Norman, Oklahoma 73069

Dear Ms. Suliin:

Permission is hereby granted to you to utilize or reproduce all or any portion of NINDB Monograph No. 3 Minimal Brain Dysfunction in Children - Terminology and Identification, U.S. Department of Health, Education and Welfare, 1966 for use in your doctoral dissertation.

I wish to express advance congratulations to you for your contributions to the fields of Specific Learning Disabilities and Juvenile Delinquency.

Sincerely,

Sam D. Clements, Ph.D., Professor
Department of Psychiatry;
Executive Director,
Child Study Center

4301 W. Markham
Little Rock, Arkansas
72201



DEPARTMENT OF CORRECTIONS

3400 N. EASTERN - P. O. BOX 11443
OKLAHOMA CITY, OKLAHOMA 73111

May 16, 1978

Ms. Sheila Suliin
College of Education
820 Van Vleet Oval
University of Oklahoma
Norman, Oklahoma 73019

Dear Ms. Suliin:

Your request to utilize resident volunteers from the Clara Waters Community Treatment Center for the Luscher Color test pilot study is approved. Please contact Superintendent Joyce Jacobson to set up an appropriate time for Mr. Reinke to administer the test. She can be contacted at 478-0961.

Sincerely,

A handwritten signature in cursive script, appearing to read "Cliff Sandel". The signature is written in dark ink and is positioned above the typed name and title.

G. Clifton Sandel
Assistant Administrator
Community Treatment Program

GCS/dm

cc: Joyce Jacobson
Bud Clark
File

APPENDIX D

DIRECTIONS TO THE SUBJECT
AND INTERPRETIVE PROCEDURE
FOR THE LSCT

INSTRUCTIONS FOR THE SUBJECT

1. The eight color cards are arranged in front of the person taking the test.
2. Say something to this effect: "Without trying to relate these colors to anything else, but just as colors, which of these do you like best?" Have the person indicate the preferred color and remember to thank or acknowledge him for his choice.
3. Remove this card and place it--color side down--at the beginning of a row in front of yourself.
4. Then say: "Of the colors which remain, which do you now like best?" When this has been indicated, acknowledge that, remove the card and place it--color side down--beside and to the right of the first one.
5. Continue in the same way with the remaining cards until only two are left; then say: "Of these two remaining cards, which do you prefer?" When indicated, acknowledge, take both cards and place them correctly in the 7th and 8th positions.
6. Record on a piece of paper the numbers of these eight cards in the order in which they appear from left to right.
7. Pick up the eight cards, re-shuffle them, and once again arrange them in front of the person being tested.
8. Begin the second series by saying: "I want you to look at these colors as though you had never seen them before. Don't make a conscious effort to remember or duplicate what you did last time. Which color do you now like best?"
9. Repeat 3 to 5 above.
10. Record the numbers of the second selection below the numbers already recorded.
11. Group, mark and analyze the selections (as in items 11 to 13 of Method A for the self-administered test). (Scott, 1970, pp. 7-8)

Directions for Interpretation

Interpretation of the test is based upon two facets of color: (a) structure and (b) function. Structure (objective meaning) is consistent across cultures and groups (see Table B and Appendix B for objective meanings). Function changes according to the subject's rank selection and position within the test protocol. Luscher in Scott (1969) cites five functional positions and gives interpretive data for each position for all possible color combinations (see Scott, 1969, pp. 94-171). Function positions are delineated in Scott (1969). Each subject profile is recorded and marked according to function and color position in the following manner:

A second selection is made after a short interval of two or three minutes; it is likely to be slightly different and some of the colors may be transposed, while some may move further forward or further back in the row. Where a color which was a neighbor in the first selection, then a group exists, and this is the group which should be encircled and marked with the appropriate function-symbol. These groups will very often differ to some extent from the simple grouping in pairs of the above sample. Assuming that a second selection is made by the same person who made the above choice, we might get the following:

1st selection: 3 1 5 4 2 6 0 7
 2nd selection: 3 5 1 4 2 6 7 0

In this case, it will be seen that blue (1) and violet (5) still lie side by side although their mutual position is reversed. The same applies to grey (0) and black (7). Red (3) stays in 1st position in both cases, while yellow (4), green (2), brown (6) all keep the same position in the second selection as they have in the first. Grouping is therefore carried out as shown below:

3	1	5	4	2	6	0	7
3	5	1	4	2	6	7	0
+	X	X	=	=	=	-	-

The rules for marking such test-protocols are:

- (1) The first group (or single numeral) is marked +
- (2) The second group (or single numeral) is marked X
- (3) The last group (or single numeral) is marked -
- (4) The whole of the remainder is marked =

Where pairs exist, they must be used for interpretive purposes rather than single numerals,* and for this reason the "indifferent" area (=) in the last example has been divided into two groups (=4=2 and =2=6).

Adopting the above rules for grouping and marking may result in cases in which the colors of the first and second selections are assigned different symbols. In this case, both selections should be separately marked, as follows:

	+	+	X	=	=	=	=	-
1st selection:	5	1	3	4	2	6	0	7
2nd selection:	3	5	1	4	2	7	6	0
	+	X	X	=	=	=	-	-

The second selection usually occurs more spontaneously and is more valid than the first selection, especially in doubtful cases. It is, therefore, the grouping and marking of the second selection which should be used for entry into the Tables.

A number may be common to two different functional groups, in which case both groups should be interpreted and the protocol marked as shown below:

	+	+	X	=	=	=	=	-
1st selection:	5	1	3	4	0	6	2	7
2nd selection:	3	1	5	4	0	7	2	6
	+	+	X	X	=	=	=	-

In the last case, the groups to be looked up in the tables will be: +3+1, xlx5, =4=0, =7=2, -2-6 (there are also the two additional groups = 3 - 6 and +3 -2, but no mention of these has yet been made).

After grouping, it will sometimes be found that two colors of a group in one selection have become separated or split up in the other selection, standing alone and unpaired. When this is so, the single colors are

*If the reader wishes, he may also consult the interpretations for the single number -- provided he considers the color pair as well.

enclosed in a square (see two examples below).

	+		X	X	=	=	=	=	-
1st selection:	3	1	5	4	0	6	7	2	
2nd selection:	3	2	1	5	0	4	6	7	
	+	+	X	X	=	=	-	-	

	+	+	X	X	=	=	-	-
1st selection:	3	1	5	4	0	6	2	7
2nd selection:	3	1	4	6	0	2	7	5
	+	+	X	=	=	=	=	-

In cases such as this, the Tables should be consulted for the appropriate meanings of both the group and the two colors of the separated pair. In the first example above, the entries for + 3 + 2 and for + 3 - 2 should both be used; in the second example, X 4, - 5, and X 5 X 4 should all be entered and interpreted. (Scott, 1969, pp. 31-33)

See Appendix E, p. 135 for the recording forms employed in this study.

A third factor taken into account by Luscher is designated as anxiety-stress. According to Luscher, anxiety-stress is the reflection of psychological disturbance as indicated by the rank placement of the psychological primaries in any position further back than fifth place. When this occurs, the subject must compensate by placing the auxiliary colors in positions one-four or five. Luscher calculates these anxiety-stress patterns as follows:

Summary of Rules for Marking Anxieties and Compensations

- a) The 8th position of the row always permits a repressed need (which may, or may not, constitute an "anxiety") and therefore always bears the symbol - (minus).
- b) If a basic color (1, 2, 3 or 4) occurs in 6th, 7th or 8th positions, this, together with any following colors, represents an "anxiety" providing the motive for a "compensation". Each such color should be marked -, and the letter "A" sub-scribed. They reveal the basis or bases of functional or psychic disturbance (stress sources).

- c) When colors with an "A" occur, at least the color in the 1st position should be regarded as a "compensation" and subscribed with the letter "C". The 1st position color is always marked with the symbol + (plus).
- d) If any of the colors 0, 6 or 7 occurs in positions 1, 2 or 3, this and any preceding colors represent compensations and they should all be marked +, the letter "C" being written below them.
- e) If colors with a "C" occur, at least the color in the 8th position must be regarded as an "anxiety" and subscribed with the letter "A".
- f) The intensity of the "anxiety" or of the "compensation" is marked by the allocation of exclamation marks (!), as follows:

If a basic color occurs in 6th position, 1 !; in 7th position, 2 !!; in 8th position, 3 !!!.

If any of the colors 0 6 or 7 occurs in 3rd position, 1 !; in 2nd position, 2 !!; in 1st position, 3 !!! (Scott, 1969, p. 39)

Luscher's ideal color selection would place the chromatic psychological primaries in the first four positions. Reject the two achromatics "brown" and "black" to positions seven and eight, with the neutrals, gray and purple occurring in positions five and six, except among adolescents. Adolescents, according to Luscher, can place violet (5) in positions one or two (Scott, 1969). Abnormal color positions are tabulated according to Scott (1969). (See Appendix B, Table C).

Recording Form

NAME: _____

	Trial 1								Total		Trial 2								Total		Total A	Total C	Total A & C						
	1	2	3	4	5	6	7	8	P	0	1	2	3	4	5	6	7	8	P	0									
Positions																													
Client Rank Order																													
Weighted Scale																													

Score

Total Score _____

Total A & C _____

Score _____

+ + Functions

x x Functions

= = Functions

- - Functions

+ - Functions

Grouping:

Scoring:

1. Give 2 points for #2, 3, 4, or 1 in any order for positions 1, 2, 3, or 4.
2. Give 2 points for 7 or) in any order in positions 7 or 8.
3. Give score of 2 for # 6 in position 6, 7
 2 for # 5 in position 1
 1 for # 5 in position 2
 1 for # 6 in position 8

Conflicts and Stresses

Comments:

Age _____

Grade _____

Group _____

4. Subtract Total C's and Total A's.

5. Score = X - C + A

Total possible 16

FIGURE 2. FINAL RECORDING FORM

APPENDIX E

PILOT STUDIES

Pilot Studies

Pilot studies were conducted to measure the effectiveness of the investigator's scale as a method of differentiating between groups; four pilot studies were conducted. Pilot studies one through three were conducted with the same samples, samples were changed for pilot study four.

Pilot Study I

Pilot study one was conducted with two samples: (a) ten high school students attending regular classes and (b) ten predelinquents attending alternative classes. Spearman Rank-Order Correlations were computed to determine the degree of agreement between sample groups. Obtained Rho was .38 $p < .05$. The further from 1.00 the less agreement between groups. Chi Square for each color between samples was calculated to compare weighted frequencies of color preferences. Chi Square was significant for three colors: violet, brown and black. Significant Chi Squares indicated that for the specific color compared, a difference in ranked preference between groups was indicated.

The juxtaposition of the numerical scale in Table D to the ranked color preferences demonstrated differentiation between groups. The obtained differentiation, however, was not statistically significant at or beyond the .05 level.

TABLE D
 Scale for Pilot Test 1
 Positions

Points	1	2	3	4	5	6	7	8
Colors*	4	4	4	4	4	4	4	4
	1,2,3 4,5	1,2,3 4,5	1,2,3 4,5	1,2,3 4,5	1,2,3 4,5	6,7,0	6,7,0	6,7,0

*Colors: Blue (1); Red (3); Green (2); Yellow (4);
 Violet (5); Brown (6); Black (7); and
 Grey (0)

$$\text{Color Score} = \sum X_1 + X_2 + X_3 + X_4 + X_5 + X_6$$

Pilot Study Two

Modifications were made by (a) reducing the number of maximum points per position from four to two in positions one to four and six to eight. (b) Positions five and six were considered neutral, one point was given per position for correct colors. Criteria for color positions remained the same as pilot study one.

Obtained Rho was .41 $p < .05$. Chi Square was significant for three colors. A one way ANOVA was significant at the .10 level. To discriminate further the scale was again modified for pilot study three.

Pilot Study Three

Pilot study three was conducted with the scale presented in Table 2. the revised scale provided scoring for anxiety and compensation allotments within the obtained color score. Pilot study three obtained the following results: Spearman Rho was .41 $p < .05$, demonstrating differences in color preferences between groups. (b) Chi Squares were significant for three colors. (c) The analysis of variance was significant for main effect between groups at or beyond the .05 level. To further assess effectiveness of the scale a fourth pilot study was conducted with changed samples.

Pilot Study Four

Pilot study four was carried out to further refine the investigator's scoring scale. To further establish evidence of scale reliability, the samples were changed. The sample for the normal group was ten students presently attending the University of Oklahoma between the ages of eighteen and twenty-six. The deviant sample was ten trustees from

the Oklahoma Department of Corrections, Clearwater Community Treatment Center between the ages of eighteen and twenty-six. Scoring procedure was that which appears in Table 2. Analysis of data were performed to determine (a) Rho between ranked color preferences; (b) Chi Square between ranked preference for each color between groups; (c) obtained mean scores for both groups; and (d) effectiveness of the numerical scale was determined by the computation of a one-way ANOVA.

TABLE E
Weighted Rank Preference

Group	Position							
	1	2	3	4	5	6	7	8
College	Blue	Yellow	Green	Red	Violet	Brown	Gray	Black
Incarcerated	Blue	Red	Violet	Brown	Yellow	Black	Green	Gray

Statistical computations were based upon the raw data presented in Table F; weighted frequencies were presented in Table H; ranked color preferences were presented in Table E. Statistical computations for pilot study four demonstrated (a) the ability of the LSCT to differentiate between groups; and (b) the effectiveness of the investigator's scoring scale to differentiate between groups. A Spearman Rank-Order Correlation between groups indicated Rho to be $.44 p < .05$, Rho indicated the two groups to be significantly different in color preferences. Chi Square was statistically significant at or beyond the .01 level of significance for four colors: blue, violet, brown, and black, indicating differences between groups. The analysis of variance was significant at or beyond the .006 level, indicating the

ability of the investigator's scale to differentiate between groups. Mean score for college subjects was 14.2 ($\bar{X} = 14.2$), mean score for incarcerated subjects was 6.1 ($\bar{X} = 6.1$). Anxieties were higher among incarcerated subjects than college subjects. Pilot study four indicated the effectiveness of the investigator's scale to differentiate between groups.

TABLE F
Raw Data for Pilot Test Four

Group	Color Selection	Sum X	C	A	CA	Color Score	Group	Color Selection	Sum X	C	A	CA	Color Score
College							Incarcerated						
	31256407	13	0	1	1	12		51742360	10	1	1	2	08
	41235670	16	0	0	0	18		75314260	10	3	1	4	06
	21364507	14	0	0	0	15		15362470	11	0	1	1	10
	34561207	12	0	1	1	11		51734260	10	1	1	2	08
	23456017	13	0	2	2	11		16503472	7	2	4	6	01
	21463507	15	0	0	0	17		16203547	8	2	2	4	04
	41360275	11	0	1	1	10		36420751	11	2	3	5	06
	43512607	14	0	0	0	15		63425017	9	2	2	4	08
	15243607	14	0	0	0	15		74136052	8	3	3	6	02
	14236057	16	0	0	0	18		25173460	10	1	1	2	08

TABLE G

Unweighted Frequency of Color Preference for Both Groups

Incarcerated										College Students									
Color	1	2	3	4	5	6	7	8	Total	Color	1	2	3	4	5	6	7	8	Total
Gray	0	0	0	2	1	2	0	5	10	Gray	0	0	0	0	0	2	6	1	10
Blue	3	2	2	1	0	0	1	1	10	Blue	2	5	0	1	1	0	1	0	10
Green	1	0	1	2	2	2	0	2	10	Green	3	0	4	0	1	2	0	0	10
Red	1	1	2	2	3	1	0	0	10	Red	2	2	2	2	2	0	0	0	10
Yellow	0	1	2	1	2	3	1	0	10	Yellow	3	2	2	1	1	1	0	0	10
Violet	2	3	1	0	1	1	2	0	10	Violet	0	1	2	2	1	2	1	1	10
Brown	1	3	0	1	1	0	4	0	10	Brown	0	0	0	4	3	3	0	0	10
Black	2	0	2	1	0	1	2	2	10	Black	0	0	0	0	0	0	2	8	10
TOTAL=	10	10	10	10	10	10	10	10			10	10	10	10	10	10	10	10	

TABLE H
Weighted Frequency of Color Preferences
College Students

	Incarcerated								Total Rank	Color	Position								Rank		
	1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			
0	0	0	0	10	4	6	0	5	21	8	Gray	0	0	0	0	4	6	12	1	23	7
1	24	14	12	5	0	0	2	1	56	1	Blue	16	35	0	5	4	0	2	0	62	1
2	8	0	6	10	8	0	6	2	40	37	Green	24	0	24	0	4	6	0	0	58	3
3	8	7	12	10	12	3	0	0	52	2	Red	16	14	12	10	8	0	0	0	50	4
4	0	7	12	5	8	9	2	0	43	5	Yellow	24	14	12	5	4	3	0	0	62	2
5	8	21	0	5	4	0	8	0	46	4	Brown	0	0	0	20	12	9	0	0	41	6
6	8	21	0	5	4	0	8	0	46	4	Brown	0	0	0	20	12	9	0	0	41	6
7	16	0	12	5	0	3	4	2	42	6	Black	0	0	0	0	0	0	4	8	12	8

APPENDIX F

OBTAINED DATA

TABLE I

Unweighted Frequency of Rank-Order Color Preference for Eighth Graders Attending Regular Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	0	0	0	2	9	3	14
Blue	1	3	5	2	2	1	1	0	0	14
Green	2	3	1	1	0	5	1	0	3	14
Red	3	5	4	5	0	0	0	0	0	14
Yellow	4	2	1	5	3	1	2	0	0	14
Violet	5	1	3	1	4	4	1	0	0	14
Brown	6	0	0	0	4	3	6	1	1	14
Black	7	0	0	0	1	0	1	4	8	14
Total n=14		14	14	14	14	14	14	14	14	

TABLE J

Unweighted Frequency of Rank-Order Color Preference for Ninth Graders Attending Regular Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	0	0	2	0	11	2	16
Blue	1	6	1	2	1	4	2	0	0	16
Green	2	1	4	3	2	2	5	0	0	16
Red	3	0	6	5	3	1	1	0	0	16
Yellow	4	7	1	2	3	2	1	0	0	16
Violet	5	2	4	4	4	0	0	0	2	16
Brown	6	0	0	0	2	5	5	2	2	16
Black	7	0	0	0	1	0	2	3	10	16
Total n=16		16	16	16	16	16	16	16	16	

TABLE K

Unweighted Frequency of Rank-Order Color Preference for Tenth Graders Attending Regular Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	0	1	2	1	8	2	14
Blue	1	4	3	4	1	1	1	0	0	14
Green	2	3	3	1	4	2	0	0	1	14
Red	3	3	6	5	0	0	0	0	0	14
Yellow	4	3	1	4	2	3	1	0	0	14
Violet	5	1	1	0	4	6	1	1	0	14
Brown	6	0	0	0	2	0	6	4	2	14
Black	7	0	0	0	0	0	4	1	9	
Total n=14		14	14	14	14	14	14	14	14	

TABLE L

Unweighted Frequency of Rank-Order Color Preference for Eighth Graders Attending LD Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	1	0	0	0	3	2	2	2	10
Blue	1	1	2	2	2	1	0	2	0	10
Green	2	3	1	1	1	0	2	2	0	10
Red	3	2	1	1	1	2	0	0	3	10
Yellow	4	0	1	0	1	3	1	1	3	10
Violet	5	3	1	2	2	0	1	0	1	10
Brown	6	0	0	1	3	1	3	1	1	10
Black	7	0	4	3	0	0	1	2	0	10
Total n=10		10	10	10	10	10	10	10	10	

TABLE M

Unweighted Frequency of Rank-Order Color Preference for Ninth Graders Attending LD Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	0	0	1	4	2	5	12
Blue	1	2	0	1	0	3	2	4	0	12
Green	2	0	1	0	7	3	1	0	0	12
Red	3	4	5	0	0	0	0	1	2	12
Yellow	4	0	5	3	0	0	0	1	3	12
Violet	5	4	0	1	3	1	2	1	0	12
Brown	6	0	0	4	2	3	3	0	0	12
Black	7	2	1	3	0	1	0	3	2	12
Total n=12		12	12	12	12	12	12	12	12	

TABLE N

Unweighted Frequency of Rank-Order Color Preference for Tenth Graders Attending LD Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	1	0	0	1	6	2	1	11
Blue	1	1	0	4	0	4	0	2	0	11
Green	2	2	1	0	6	1	1	0	0	11
Red	3	3	1	3	2	0	0	3	0	11
Yellow	4	1	1	2	1	2	1	2	1	11
Violet	5	2	3	1	2	1	1	1	0	11
Brown	6	0	0	1	0	2	1	1	6	11
Black	7	2	4	0	0	0	1	1	3	11
Total n=11		11	11	11	11	11	11	11	11	

TABLE O

Unweighted Rank-Order Color Preference of Predelinquent Eighth Graders Attending Alternative Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	1	1	1	1	3	5	12
Blue	1	3	0	3	1	0	1	3	1	12
Green	2	0	1	0	3	1	4	0	3	12
Red	3	1	3	1	5	1	1	0	0	12
Yellow	4	1	1	2	1	1	4	2	0	12
Violet	5	2	4	3	0	2	0	1	0	12
Brown	6	2	2	1	0	4	0	1	2	12
Black	7	3	1	1	1	2	1	2	1	12
Total n=12		12	12	12	12	12	12	12	12	

TABLE P

Unweighted Rank-Order Frequency of Color Preference for Predelinquent Ninth Graders Attending Alternative Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	1	1	2	0	2	0	4	10
Blue	1	2	4	0	0	1	1	1	1	10
Green	2	0	0	2	1	3	1	1	2	10
Red	3	0	2	0	1	4	3	0	0	10
Yellow	4	1	1	0	4	1	1	2	0	10
Violet	5	4	0	2	1	0	2	0	1	10
Brown	6	0	2	2	0	1	0	5	0	10
Black	7	3	0	3	1	0	0	1	2	10
Total n=10		10	10	10	10	10	10	10	10	

TABLE Q

Unweighted Rank-Order Frequency Color Preference for Predelinquent Tenth Graders Attending Alternative Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	1	1	1	1	1	1	3	2	11
Blue	1	3	0	1	0	1	2	2	2	11
Green	2	1	1	2	1	1	1	2	2	11
Red	3	3	0	1	3	1	2	1	0	11
Yellow	4	1	3	2	1	2	2	0	0	11
Violet	5	1	2	2	4	0	1	1	0	11
Brown	6	0	2	2	1	3	2	0	1	11
Black	7	1	2	0	0	2	0	2	4	11
Total n=11		11	11	11	11	11	11	11	11	

TABLE R

Total Unweighted Rank-Order Color Preference Frequencies for Eighth, Ninth and Tenth Grade Subjects Attending Regular Classes

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	0	0	0	1	4	3	28	7	44
Blue	1	13	9	7	4	6	4	1	0	44
Green	2	7	8	5	6	9	6	0	4	44
Red	3	8	16	15	3	1	1	0	0	44
Yellow	4	12	3	11	8	6	4	0	0	44
Violet	5	4	8	6	12	10	2	0	2	44
Brown	6	0	0	0	8	8	17	7	4	44
Black	7	0	0	0	2	0	7	8	27	44
Total n=44		44	44	44	44	44	44	44	44	

TABLE S

Total Unweighted Rank-Order Frequency of Color Preference for Learning Disabled Eighth, Ninth and Tenth Grade Subjects

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	1	1	0	0	5	12	6	8	33
Blue	1	4	2	7	2	8	2	8	0	33
Green	2	5	3	1	14	4	4	2	0	33
Red	3	9	7	4	3	1	2	5	2	33
Yellow	4	1	7	5	2	4	1	3	10	33
Violet	5	9	4	4	7	2	4	2	1	33
Brown	6	0	0	6	5	6	7	2	7	33
Black	7	4	9	6	0	3	1	5	5	33
Total n=33		33	33	33	33	33	33	33	33	

TABLE T

Unweighted Frequency of Rank-Order Color Preference for Predelinquent Subjects Attending Alternative
Classes Grades 8 - 10

Color	Color Code	Position								Total
		1	2	3	4	5	6	7	8	
Gray	0	1	2	3	4	2	4	6	11	33
Blue	1	8	4	4	1	2	4	6	4	33
Green	2	1	2	4	5	5	6	3	7	33
Red	4	3	5	4	6	4	7	4	0	33
Yellow	4	3	5	4	6	4	7	4	0	33
Violet	6	2	6	5	1	8	2	6	3	33
Brown	6	2	6	5	1	8	2	6	3	33
Black	7	7	3	4	2	4	1	5	7	33
Total n= 33		33	33	33	33	33	33	33	33	

TABLE U

Weighted Frequency of Rank-Order Color Preference for Eighth Graders Attending Regular Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	0	0	0	6	18	3	27	7
Blue	1	24	35	12	10	4	3	0	0	88	2
Green	2	24	7	6	0	20	3	0	3	63	5
Red	4	16	7	30	15	4	6	0	0	98	3
Yellow	4	16	7	30	15	4	6	0	0	78	3
Violet	5	8	21	6	20	16	3	0	0	74	4
Brown	6	0	0	0	20	12	18	2	1	53	6
Black	7	0	0	0	5	0	3	8	8	24	8

TABLE V

Weighted Frequency of Rank-Order Color Preference for Ninth Graders Attending Regular Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	0	0	8	0	22	2	32	8
Blue	1	48	7	6	5	16	6	0	0	88	4
Green	2	8	28	18	10	8	15	0	0	87	5
Red	3	0	42	30	15	4	3	0	0	94	2
Yellow	4	56	7	12	15	8	3	0	0	101	1
Violet	5	16	28	24	20	0	0	0	2	90	3
Brown	6	0	0	0	10	20	15	6	2	53	6
Black	7	0	0	0	5	0	6	9	10	34	7

TABLE W

Weighted Frequency of Rank-Order Color Preference for Tenth Graders Attending Regular Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	0	5	8	3	16	2	34	8
Blue	1	32	21	24	5	4	3	0	0	89	2
Green	2	24	21	6	20	8	0	0	1	80	3
Red	3	24	42	30	0	0	0	0	0	96	1
Yellow	4	24	7	24	10	12	3	0	0	80	4
Violet	5	8	7	0	20	24	3	2	0	64	5
Brown	6	0	0	0	10	0	18	8	2	38	6
Black	7	0	0	0	0	0	24	2	9	35	7

TABLE X

Weighted Frequency of Rank-Order Color Preference for Tenth Graders Attending LD Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	7	0	0	4	18	4	1	34	7
Blue	1	8	0	24	0	16	0	4	0	52	5
Green	2	16	7	0	30	4	3	0	0	60	3
Red	3	24	7	18	10	0	0	4	0	63	2
Yellow	4	8	7	12	5	8	3	4	1	52	6
Violet	5	16	21	6	10	4	3	2	0	67	1
Brown	6	0	0	6	0	8	3	2	6	31	8
Black	7	16	28	0	0	0	3	2	3	59	4

TABLE Y

Weighted Frequency of Rank-Order Preference for Ninth Graders Attending LD Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	0	0	4	12	4	5	25	8
Blue	1	16	0	6	0	12	6	8	0	48	7
Green	2	0	7	0	35	12	3	0	0	57	4
Red	3	32	35	0	0	0	0	2	2	71	1
Yellow	4	0	35	18	0	0	0	2	3	58	3
Violet	5	32	0	6	15	4	6	2	0	65	2
Brown	6	0	0	24	10	12	9	0	0	55	5
Black	7	16	7	18	0	4	0	6	2	53	6

TABLE 2

Weighted Frequency of Rank-Order Color Preference for Eighth Graders Attending LD Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	8	0	0	0	12	6	4	2	32	8
Blue	1	8	14	12	18	4	0	4	0	50	5
Green	2	24	7	6	5	0	6	4	0	52	4
Red	3	16	7	6	5	8	0	0	3	45	6
Yellow	4	0	7	0	5	12	3	2	3	58	1
Violet	5	24	7	12	8	0	3	0	1	55	2
Brown	6	0	0	6	15	4	9	2	1	37	7
Black	7	0	28	18	0	0	3	4	0	53	3

TABLE AA

Weighted Rank-Order Color Preference of Predelinquent Eighth Graders Attending Alternative Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	6	5	4	3	6	5	29	8
Blue	1	24	0	18	5	0	3	6	1	57	3
Green	2	0	7	0	15	4	12	0	3	41	7
Red	3	8	21	6	25	4	3	0	0	67	2
Yellow	4	8	7	12	5	4	12	4	0	52	6
Violet	5	16	28	18	0	8	0	2	0	72	1
Brown	6	16	14	6	0	16	0	2	2	56	4
Black	7	24	7	6	5	8	1	4	1	56	5

TABLE BB

Weighted Rank-Order Frequency of Color Preference for Predelinquent Ninth Graders Attending Alternative Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	7	6	10	0	6	0	4	33	8
Blue	1	16	28	0	0	4	3	2	1	54	2
Green	2	0	0	12	5	12	3	2	2	36	7
Red	3	0	14	0	5	16	9	0	0	44	5
Yellow	4	8	7	0	20	4	3	4	0	46	4
Violet	5	32	0	12	5	0	6	0	1	56	1
Brown	6	0	14	12	0	4	0	10	0	40	6
Black	7	24	0	18	5	0	0	2	2	51	3

TABLE CC

Weighted Rank-Order Frequency of Color Preference for predelinquent Tenth Graders

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	8	7	6	5	4	3	6	2	41	7
Blue	1	24	0	6	0	4	6	4	2	46	5
Green	2	8	7	12	5	4	3	4	2	45	6
Red	4	8	21	12	5	8	6	0	0	60	1
Yellow	3	24	0	6	15	4	6	2	0	57	3
Violet	5	8	14	12	20	0	3	2	0	59	2
Brown	6	0	14	12	5	12	6	0	1	50	4
Black	7	8	14	0	0	8	0	4	4	38	8

TABLE DD

Total Weighted Rank-Order Color Preference Frequencies for Eighth, Ninth and Tenth Grade Subjects
Attending Regular Classes

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	0	0	0	5	16	9	56	7	93	7
Blue	1	104	63	42	20	24	12	7	0	272	2
Green	2	56	72	30	30	36	18	0	4	246	4
Red	3	64	112	80	15	4	3	0	0	278	1
Yellow	4	96	21	66	40	24	12	0	0	259	3
Violet	5	32	56	36	60	40	6	0	2	232	5
Brown	6	0	0	0	40	32	51	14	4	141	6
Black	7	0	0	0	10	0	21	16	27	74	8

FIGURE EE

Total Weighted Rank-Order Frequency of Color Positions for Learning Disabled Eighth, Ninth and Tenth Grade Subjects

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	8	7	0	0	20	36	12	8	91	8
Blue	1	32	14	42	10	32	6	16	0	152	5
Green	2	40	21	6	60	16	12	4	0	159	3
Red	3	72	49	24	15	4	6	10	2	182	2
Yellow	4	8	49	30	10	16	3	6	10	132	6
Violet	5	72	32	24	35	8	12	4	1	195	1
Brown	6	0	0	30	25	24	21	4	7	111	7
Black	7	32	63	30	0	12	3	10	5	157	4

TABLE FF

Total Weighted Rank-Order Frequency of Color Preference for Predelinquent Eighth, Ninth and Tenth Grade Subjects

Color	Color Code	Position								Total	Rank
		1	2	3	4	5	6	7	8		
Gray	0	8	14	18	20	8	12	12	11	103	8
Blue	1	64	28	24	5	8	12	12	4	157	4
Green	2	8	14	24	25	20	18	6	7	122	7
Red	3	32	35	12	45	24	18	2	0	168	3
Yellow	4	24	35	24	54	16	21	8	0	182	2
Violet	5	56	42	42	25	8	9	4	1	187	1
Brown	6	16	42	35	5	32	6	12	3	151	5
Black	7	56	21	24	10	16	3	10	7	147	6

TABLE GG

Weighted Rank-Order Color Preference for Regular Subjects

Group	Grade	Position							
		1	2	3	4	5	6	7	8
Regular	8	Red	Blue	Yellow	Violet	Green	Brown	Gray	Black
Regular	9	Yellow	Red	Violet	Blue	Green	Brown	Black	Gray
Regular	10	Red	Blue	Green	Yellow	Violet	Brown	Black	Gray

TABLE HH

Weighted Rank-Order Color Preference for Learning Disabled Subjects

Group	Grade	Position							
		1	2	3	4	5	6	7	8
LD	8	Yellow	Violet	Black	Green	Blue	Red	Brown	Gray
LD	9	Red	Violet	Yellow	Green	Brown	Black	Blue	Gray
LD	10	Violet	Red	Green	Black	Blue	Yellow	Gray	Brown

TABLE II

Weighted Rank-Order Color Preference for Predelinquent Subjects

Group	Grades	Position							
		1	2	3	4	5	6	7	8
Predelinquent	8	Violet	Red	Blue	Brown	Black	Yellow	Green	Gray
Predelinquent	9	Violet	Blue	Black	Yellow	Red	Brown	Green	Gray
Predelinquent	10	Red	Violet	Yellow	Brown	Blue	Green	Gray	Black