THE EMOTIONAL ADJUSTMENT OF A LEARNING DISABLED POPULATION IN ADULTHOOD, AS MEASURED BY THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

by

Vivian Russell

B. A. Saint Mary's University, 1981

A THESIS SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Psychology

[redacted]

We accept this thesis as conforming
to the required standard

[redacted]

Otfried Spreen, Supervisor

[redacted]

Pam Duncan, Committee Member

[redacted]

Roger Ruth, Committee Member

UNIVERSITY OF VICTORIA

April, 1984

Supervisor: Dr. O. Spreen

ABSTRACT

The purpose of this study was to examine the personality and psychiatric aspects of a group of adults who had been diagnosed in childhood as suffering from a primary learning disability. Previous research has produced equivocal results, with some investigators claiming long-lasting emotional maladjustment in learning handicapped individuals, and others stating that the child "outgrows" most of the adverse affective concomitants associated with his learning disability. In the present study one hundred and seven subjects, identified in childhood as being learning handicapped, as well as a control group of forty-six average academic achievers, were administered the Minnesota Multiphasic Personality Inventory as adults. The learning handicapped subjects were divided into three groups based on presence and extent of neurological involvement in childhood: Group 1 (BD) had hard neurological signs, Group 2 (MBD) had soft signs, Group 3 (LD) had no sign of brain damage. Clinical subscales of the MMPI were selected to highlight the expected picture of general unhappiness and emotional maladjustment. It was hypothesized that the learning handicapped groups would have elevated scores on the MMPI compared to controls, but would not be significantly

different from each other. On the selected subscales it was predicted that there would be a clear pattern of increasing maladjustment from the controls through the LD and MBD groups, with the BD group showing the most disturbed picture. In general the hypotheses were supported, with the three learning handicapped groups showing poorer adjustment as measured by the MMPI, and the selected subscales indicating that the controls consistently displayed better adjustment and a more positive outlook on life. The results of individual group comparisons on the MMPI scales and the subscales are discussed and possible explanations for the findings are offered.

Examining Committee:

[redacted]
Dr. Otfried Spreen

[redacted]
Dr. Pam Duncan

[redacted]
Dr. Roger Ruth

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

The author wishes to express her appreciation to her committee members, Drs. Pam Duncan and Roger Ruth for their helpful comments in the preparation of this thesis. The assistance of Bob Kobierski with the printing of the first draft is also appreciated, as well as that of Eugene Dean whose help with the data analysis was invaluable. Special thanks also go to Clare Porac, who not only generously allowed the use of her equipment, but also provided a home during the final stage of the project.

Finally, most sincere gratitude is expressed to Dr. Otfried Spreen, whose knowledge of the area under study is exceeded only by his patience and approachability as a supervisor.

DEDICATION

For all the friends who made the "Victoria time" such a worthwhile experience, especially Clare, Janet, Kevin and Larry, who were always there. And most of all for Bruce and Jillian, who provide the meaning for everything.

CHAPTER I

Introduction

Clinicians who have been involved in the assessment or treatment of children suffering from learning disabilities, whether or not directly attributable to brain damage, have generally agreed that these disabilities are accompanied in the majority of cases by affective concomitants. The importance placed by the clinician on these emotional aspects of the child's functioning depends on a number of variables, including the theoretical framework of the investigator, the age of the child, and whether the emotional disturbances are likely to decrease as remedial work is done in an attempt to alleviate the learning disability. Some have concluded that both learning disabilities and minimal brain dysfunction (MBD), in its more severe forms "may be the precursor of a number of psychiatric disorders of later life including emotionally unstable and impulsive personality disorders and sociopathy" (Wender, 1975, p. 61). In fact, Denhoff (1973) described what occurs during the natural life history of MBD children as a struggle for survival.

This study examines the personality and psychiatric aspects of a group of adults who had been diagnosed in childhood as suffering from a primary learning disability. The concept of "learning disability" remains ill-defined,

with some investigators excluding from their research groups those children whose difficulties are due primarily to neurological impairment (Trites & Fiedorowicz, 1976) and others adopting a broader set of criteria. A learning disability is simply the inability to learn normally and may encompass a wide spectrum of skills or be relatively specific to a certain area such as reading.

The terms hyperactivity and hyperkinesis are usually employed synonymously and generally describe a pattern of problematic behaviors characterized by overactivity, restlessness, distractibility, and impulsiveness. Learning disabilities may also form part of this syndrome.

The term "minimal brain dysfunction" (MBD) has also been widely applied to children whose problems include a severe learning disability, but few researchers agree on a precise definition of this syndrome, which includes children with behavioral difficulties and/or perceptual and cognitive difficulties (Wender, 1975). Many researchers state that hyperactivity is one of the most frequent concomitants of MBD (Wender, 1971), whereas others object to the supposition of neurological involvement and treat learning disabilities, whether accompanied by hyperactivity or not, as a behavioral disorder whose physiological etiology remains uncertain at best (Bryan & Bryan, 1975).

For the purposes of this study, the definition used by the Canadian Association for Children with Learning Disabilities (Cruickshank, 1978) has been adopted:

> Learning disabilities are problems in the acquisition of developmental skills, academic achievement, social adjustment, and secondarily of emotional growth and development, which are the result of perceptual and linguistic processing deficits.
>
> These disabilities
>
> (a) may be of any etiological origin,
>
> (b) may be observed in children and youth of any age and of any level of intellectual function,
>
> (c) are the results of perceptual processing deficits which, in turn, are or may be the result of a (diagnosed or inferred) neurophysiological dysfunction occurring at prenatal, perinatal or (in the case of linguistic dysfunction) at the postnatal periods of development.

Certain aspects of the above definition merit special attention in the context of this study. The statement is made that secondary to learning disabilities problems of emotional growth and development can occur and that these may be observed in children and youth of any age. As stated previously, these are commonly held views. For example, Wender (1975), in discussing the MBD syndrome stated:

> From the impression of clinicians working in varying settings, it would appear that the syndrome constitutes the single most common cause of chronic behavioral problems in the pre-adolescent age group. (p. 45)

Few statements have been made about these children after they pass out of adolescence. The lack of achievement in academic settings has been implicated as a causative factor in later emotional difficulties in that the child's school failures, parental and teacher disappointment, and rejection by peers form a generally unhappy, frustrating pattern from which the child cannot emerge unscathed. The prognosis for the learning disabled child in the area of academic achievement has been mixed, with some studies showing favorable outcome (Preston & Yarington, 1977; Rawson, 1965; Robinson & Smith, 1962) and others painting a generally gloomy picture (Balow & Blomquist, 1965; Hardy, cited in Hinton & Knights, 1971; Hermann, 1959; Hinton & Knights, 1971). In cases where academic and vocational success has been achieved, there has been a strong intelligence factor identified, with very bright children seemingly able to overcome their disability with intense remediation, particularly in private school settings (Rawson, 1965; Robinson & Smith, 1962; Spreen, 1982).

The chief concern of this study is what happens to those children who, because of a primary learning disability, do not achieve academic success in a society which places great value on that achievement. When a learning disability prevents a child from making normal scholastic progress, what effect does this have on other aspects of his functioning in adulthood? As Spreen (1976) questions: Does being "slow in school...automatically lead

to failure and unhappiness in life?" (p. 451). This study investigates one small part of the emerging clinical picture of learning disabled children grown up.

Review of the Literature

The following studies have been divided into three sections: (a) studies of children with learning disabilities, MBD, and/or hyperactivity, (b) follow-up studies of children with these problems, and (c) because of the focus of the present investigation, studies employing the Minnesota Multiphasic Personality Inventory (MMPI) (Hathaway and McKinley, 1940) as a follow-up measure.

Studies of Children with Learning Disabilities, MBD and/or Hyperactivity

In an early attempt to clearly delineate a diagnosable syndrome, Laufer and Denhoff (1957) described the clinical picture exhibited by children suffering from "hyperkinetic impulse disorder." This disorder was characterized by hyperactivity, short attention span, poor concentration, impulsivity, irritability, explosiveness, variability, and poor school work. The authors stated that this syndrome may be due to organic causes and is often accompanied by emotional disturbances. However, they conclude that the syndrome tends to disappear by the time adulthood has been reached, although no quantitative data or follow-up was reported.

In a study of the "hyperactive child syndrome", Stewart, Pitts, Craig and Dieruf (1966) compared the life histories of a group of hyperactive children with those of a group of normal controls in order to provide a detailed

description of the syndrome. They also examined antisocial behaviors which they felt might be possible prognosticators of adult sociopathy. Thirty-seven hyperactive patients between the ages of 5 and 11 were examined and tested, and their mothers interviewed. Comparison on a number of variables showed the hyperactive children to have significantly more neurological signs than the control subjects. In looking at what seemed to indicate antisocial behavior, they found that 16 patients lied persistently and 10 had stolen money. However, only 6 patients showed three or more of the symptoms identified as being antisocial: lying, stealing, vandalism, fire-setting, cruelty to animals, and contact with the police. The authors speculate that the 6 patients with the highest antisocial symptom scores probably had a "severe form of the hyperactive syndrome, rather than representing a discrete subgroup" (p. 866). They state that the syndrome is often accompanied by emotional disturbances, but with treatment tends to disappear by the time the children are adults. Unfortunately, no follow-up was reported to support this conclusion.

Two studies by Hertzig and Birch (1966, 1968) provide evidence for a possible link between the presence of non-localizing signs of central nervous system dysfunction and serious psychological disturbances. The authors examined 204 adolescents admitted to a psychiatric hospital and found that signs of significant CNS dysfunction were six times more frequent than would be expected in the

general population. Of their patient group, 10 had hard signs of neurological impairment and 76 had one or more soft signs, including such things as disturbances of speech, failure to maintain balance, hyperkinesis, and coordination defects. The signs of neurological dysfunction were positively associated with the severity of psychiatric illness and, in males, with a diagnosis of sociopathic behavior disturbances. The conclusion was that "risk of developing a psychiatric illness is increased in the presence of CNS abnormality" (p. 536).

Further evidence to support the Hertzig and Birch (1966, 1968) finding came in a study by Hartocollis (1968) of patients seen in a psychiatric hospital between the ages of 15 and 25. These patients had not been diagnosed previously as having any type of neurological abnormality, but a high proportion of clients with formerly undiagnosed MBD syndrome was revealed, characterized by congenital abnormalities in over half the patients, ranging from skull asymmetries and spina bifida occulta, to strasbismus and crossed laterality. There was also evidence of abnormal motor behavior such as restlessness and overreactivity, as well as learning difficulties. The psychiatric diagnoses for these patients included infantile personality, depressive reaction, schizophrenic reaction, schizoaffective reaction, and adjustment reaction of adolescence.

Another study which attempted to link CNS abnormalities with a specific psychiatric diagnosis was

done by Quitkin and Klein (1969). They looked at 105 adolescent and young adult psychiatric patients and found two relatively homogeneous behavioral syndromes associated with soft organic signs (deviant motor or sensory performances including strabismus, hypotonia, and speech impediment). The first group, termed "socially awkward, withdrawn" (12 cases) showed obvious intellectual defects, thought disorder, lack of social skills, withdrawal and marked inability to organize their life. The second group, the "impulsive-destructive group" (19 cases) showed relatively intact intellectual and social functioning with infrequent thought disorders. This second group was characterized by destructive, impulsive behavior, low frustration tolerance, endogenous mood swings, emotional overreactivity and temper tantrums. The symptom pattern appears somewhat analogous to that of sociopathy. In an attempt to clarify and validate this finding, Quitkin (1976) looked at 350 consecutive admissions to a psychiatric hospital, to substantiate the hypothesis that there would be increased evidence of neurological soft signs for two subgroups: schizophrenics with premorbid asociality (SPA) and emotionally unstable character disorders (EUCD). The SPA group (27 cases) was made up of patients characterized by "social incompetence...academic difficulty and a limited range of interests" (p. 845). Those in the EUCD group (22 cases) were "antisocial, impulsive and had short, nonreactive, bipolar mood swings" (p. 845). The tests for neurological soft signs were done

by an examiner unaware of all other tests and diagnoses. In a series of comparisons with other diagnostic groups, the SPA and EUCD groups had significantly more soft signs, supporting the hypothesis.

Studies of children with learning disabilities but no evidence of neurological involvement have also demonstrated the presence of emotional difficulties. For example, Larsen, Parker and Jorjorian (1973) examined 28 fourth-graders diagnosed as being learning disabled. The Coopersmith Self-Concept Inventory showed that the students with learning disabilities had more negative self-concepts than normal controls. Wallace and Kaufman (1973) also found learning disabled children to have low self-concepts. In contrast, Mindingall, Libb, and Welch (1980) studied 51 learning disabled children between the ages of 7 and 11 and found no evidence of emotional instability, inhibition, or frustration, although their subjects appeared to be somewhat impulsive and anxiously insecure. The authors stated that the differences in their findings could be partially explained by the fact that their sample was not the same as those in other studies on variables such as age, sex and intelligence.

In a study of 28 boys and 12 girls diagnosed between the ages of 8 and 11 as "backward" readers, Frost (1965) measured emotional adjustment using the Bristol Social Adjustment Guide. On this instrument, only 20% of the group showed fairly good adjustment. The Depression Scale showed elevated scores for 50% of the girls and 57% of the

boys. However, this study suffers from the lack of a control group.

As part of the comprehensive Isle of Wight Study, Yule and Rutter (1968) looked at a subset of 126 children between the ages of 9 and 11 who had some clinically important psychiatric disorder. This group broke down into two major diagnostic subgroups: neurotic disorders and antisocial disorders. On examination of reading attainment scores, there appeared to be a strong association between poor reading and antisocial disorder (over one third of the antisocial children were severely retarded in reading). There was little association between reading attainment and neurotic disorder; reading retardation in neurotic children was only slightly more frequent than in the general population.

Follow-up Studies of Children with Learning Disabilities, MBD, and/or Hyperactivity

Despite the paucity of well-controlled follow-up studies of learning disabled subjects, researchers have frequently stated that the presence of learning disabilities, MBD, and/or hyperactivity contributes to serious emotional maladjustment in adulthood. As a learning handicapped student the child may suffer from frustration, anxiety and anger, which, if not successfully dealt with, may lead to a negative self-image (Connolly, 1968). This in turn may persist in varying degree and form in the adult.

Follow-up studies often draw their subjects from very heterogeneous populations, sometimes from adult psychiatric groups in which certain individuals have been retrospectively diagnosed as learning disabled or hyperactive. In an early study by Robins (1966), records from a child guidance clinic were examined up to thirty years after the original referral and an attempt was made to contact those patients and examine them on a multitude of variables. Of the follow-up population, 68% of those diagnosed as sociopaths in adulthood had had school retardation, although it is not clear from the data what role learning disabilities per se played in this outcome.

Menkes, Rowe, and Menkes (1967) followed-up 14 patients diagnosed as having hyperkinesis with MBD in childhood. The mean follow-up time was 24 years. These subjects were examined on a number of measures, including a comprehensive interview, neurological examination, the Ammons Full Range Picture Vocabulary, and the Bender Gestalt Test. At follow-up, four were in institutions with a diagnosis of psychoses, two were retarded, and dependent on families, eight were self-supporting. Of the eight independent subjects, four had spent some time in an institution: one in jail, one in a hospital for the retarded and the other two in institutions for delinquent boys. The neurological examination showed definite abnormalities in two of the psychotic cases but the other two were normal. The two retarded individuals also had definite neurological dysfunction. Of the four who had

spent time in other institutions, three had definite neurologic abnormalities, while one was not examined. In the group of seven subjects diagnosed as having definite neurological abnormalities as adults, five had shown hard signs of brain dysfunction as children, while the others were diagnosed as probable dysfunction.

In one of the more comprehensive follow-up studies, Weiss, Minde, Werry, Douglas, and Nemeth (1971) examined chronically hyperactive children four to six years after referral to a psychiatric outpatient clinic of a pediatric hospital. The mean age at follow-up was 13 years. While the initial presenting complaint of hyperactivity had diminished enough to cause 70% of the mothers to rate their child as improved, the examining child psychiatrists found that emotional immaturity, poor self-esteem, hopelessness, and poor social adaptation were serious problems in many of the children.

In a study of adolescents, Mendelson, Johnson and Stewart (1971) followed-up 83 children between the ages of 12 and 16 who had been diagnosed as hyperactive two to five years earlier. At the time of follow-up, many of these children were suffering from emotional problems: low self-confidence (54%); feels a failure in school (42%); feels not liked (57%); loner, has no friends (46%); frequent low moods (39%); temper tantrums (56%); irritable (67%); talk of suicide/suicide attempt (15%); and demonstrated antisocial behavior such as lying, stealing, fighting and destructiveness (8%). The authors speculated

that those in the last group were liable to show sociopathy as adults.

Morrison and Menkoff (1975), in three case studies of adults demonstrating hyperactivity as children, stated that these patients showed excessive anger and could be described as having an "explosive personality syndrome."

Borland and Heckman (1976) attempted to control for the problem of retrospectively diagnosing adult psychiatric patients by selecting 20 men who had displayed symptoms of hyperactivity on referral to a child guidance clinic 20 to 25 years earlier. At follow-up these men showed signs of excessive aggression and impulsivity as well as being significantly more restless and nervous, had difficulty controlling their temper, were easily upset and depressed more often than controls.

Dykman, Peters, and Ackerman (1973) administered the Minnesota Counseling Inventory to a group of 14 year old boys who had been diagnosed as learning disabled between the ages of 8 and 11. The learning disabled boys had a higher incidence of problems than control subjects in nearly all areas measured: Family Relations, Social Relations, Emotional Stability, Reality, Mood, and Leadership. Only Conformity scores were not grossly different from controls, but there was some evidence of manifest unsocialized and/or aggressive behavior. Furthermore, the learning disabled boys did not perceive their problems in the same way as did their parents and teachers, and their scores on the Reality scale most

clearly separated them from controls.

In 1979 Peter and Spreen reported on the first follow-up of the population presently under study. Behavioral symptoms and personal adjustment at that time were measured using a behavior rating scale completed by the parents of the subjects, as well as the Adjustment Inventory by Bell (1962) which consists of 140 yes-no type questions which contribute to the four adjustment components of emotional, social, home, and health. The authors found a significant relationship between the presence of a learning disability in middle childhood and maladjustment in adolescence and young adulthood. Abnormal behavior patterns were significantly related to the presence of neurological signs, intelligence, and sex, with demonstrable brain damage being associated with greater behavioral deviance. Lower intellectual levels were also associated with greater maladjustment and females showed more maladaptive behaviors than did males.

Follow-up Studies Using the MMPI

Although the MMPI is a widely used and researched instrument, few studies exist which use the test with a learning disabled population. Those studies which are available suffer in the generalizability of their results due to the fact that most draw their subjects from psychiatric populations where primary emotional disturbances may have obscured the impact of the learning

disability per se.

Balow and Blomquist (1965) attempted to follow-up 32 reading disabled males 10 to 15 years after initial assessment at the University of Minnesota Psycho-Educational Clinic. Of these, nine were available for complete retesting and as part of this procedure were given the MMPI. It was reported that eight of the nine subjects tested showed "some personality deviancy" (p. 48). Unfortunately, profile patterns or group scores were not given.

In a 10 year follow-up study of adolescents admitted to a child guidance clinic Kaste (1971) administered a battery of psychological tests, E.E.G., and neurological examination. She divided her subjects into four groups: (a) abnormal on all three exams (Cerebral Dysfunction group), (b) abnormal on two exams, (c) abnormal on one exam, and (d) normal on all exams. The MMPI was also given and the author found that the proportions of abnormal profiles were not significantly different among the four groups. The only statistically significant difference found was on the L scale (described in the Method section), where the Cerebral Dysfunction group had a higher mean score than the other three groups. Evidence from a Clinical Adjustment Rating Scale based on interview and questionnaire data showed that the subjects in this study did not "grow out of" their problems. In fact, nearly half of the subjects still had serious adjustment problems. The results suggested that childhood maladjustment persists

into adulthood. The Cerebral Dysfunction group was overall the most dysfunctional group, with 69% showing poor adjustment at follow-up, compared to 46%, 40%, and 29% respectively in the other three groups. It must be kept in mind that these subjects had all been originally seen in a clinic because of behavioral and/or psychological disturbances severe enough to warrant referral by another agency. These primary emotional problems, persisting into adulthood, may have clouded possible group differences on the MMPI which could have been attributed to the presence or absence of a learning disability and/or brain damage. The preponderance of abnormal profiles in the Kaste study tends to lend credence to this possibility.

CHAPTER II

Method

Subjects

All subjects included in this study were selected from a group of 203 clients originally referred to the Neuropsychology Clinic of the University of Victoria between 1965 and 1973 for assessment of a primary learning disability. At the time of the initial evaluation, all subjects were between the ages of 7 and 12, with a mean age of 8.4 years. An extensive follow-up of the original group was undertaken in 1978 when the subjects reached a mean age of 18.3 years (Peter & Spreen, 1979). In order to be included in the follow-up study, the following criteria had to be met:

1. Initial assessment had been made between the ages of 7 and 12.
2. A neurological examination had been made at the time of the initial assessment.
3. Subject had a Verbal or Performance I.Q. of 70 or more.
4. Referral must have been for a primary learning disability, not emotional or behavioral problems, and not because of brain damage acquired in childhood.

The resulting 152 cases were then divided into three groups based on the presence or absence of "hard" or "soft" neurological signs (see Appendix A for a list of hard and soft neurological signs). Subjects with one or more hard signs (with or without soft signs) were assigned to Group 1 (BD); with one or more soft signs but no hard signs, to Group 2 (MBD); with no evident neurological signs but a learning disability, to Group 3 (LD). At the time of the first follow-up a control group (C) of 52 subjects was selected from local junior and senior secondary school records. The control subjects were matched to the clinic population by means and range for age, sex, and socioeconomic status.

Many researchers continue to pursue the connection between left-handedness and learning disabilities, with the implication being that left-handedness is a sign of some unusual cerebral organization which might give rise to a learning handicap. Harshman, Hampson, and Berenbaum (1983) summarized this view by stating:

> It has been postulated that left-handedness might represent a marker of brain insult, and thus constitute a pathological condition. On this basis, it was predicted that left-handers might show some cognitive deficits as a consequence of their early trauma. (p. 147)

This supposed pathological condition, or incomplete lateralization of language function, has been purported to underlie difficulties in reading (Orton, 1937). Possible

connections between left-handedness and learning handicaps were examined in another phase of the current follow-up study, and to this purpose the subjects and controls were also matched for handedness.

If there was a suggestion of epilepsy or head injury, the individual was not included. None of the control group had received professional counselling for learning disabilities and were considered to be average achievers in school between the ages of 8 and 12 (C+ to B range). The medical background of these individuals showed no evidence of neurological impairment.

For the present assessment, which is part of a larger follow-up study undertaken in 1982, an attempt was made to contact all subjects from the first follow-up. Subjects who could be traced and were willing to participate were given a comprehensive interview and an extensive test battery, including the MMPI. The total number of subjects participating in the second follow-up was 192, of whom 159 completed the MMPI. Upon examination of these forms, six were eliminated for reasons detailed in the following section. The group assignment of the total follow-up population, as well as that of the 153 subjects with valid MMPI's, is shown in Table 1. Females made up 29% of the subjects and a chi square analysis showed no significant difference in the proportion of males and females in each group.

Table 1

Group Assignment of Subjects

Group	No. in follow-up	No. with MMPI	No. eliminated	Total Male	Female	Total
BD	55	47	4	31	12	43
MBD	59	48	1	36	11	47
LD	27	17	-	12	5	17
C	51	47	1	29	17	46
Total	192	159	6	108	45	153

Procedure

The MMPI is a standard test instrument constructed for use as a psychiatric screening device. It consists of 566 statements which are endorsed as True or False. The MMPI was developed on an empirical basis by comparing the responses of previously diagnosed clinical populations, for example, depressives, with those of a normal adult population. Ten scales were devised by which a clinical profile of the person taking the test is shown. These scales are labelled 1 (Hypochondriasis), 2 (Depression), 3 (Hysteria), 4 (Psychopathic Deviate), 5 (Masculinity-Feminity), 6 (Paranoia), 7 (Psychasthenia), 8 (Schizophrenia), 9 (Hypomania), and 10 (Social

Introversion). The profile is shown using transformed (T) scores, which are the standard score equivalents of the raw scores of the subject on each of the scales.

In addition to the 10 clinical scales, there are 4 other scales which act as validity checks: the Cannot Say (?) scale, the L scale, the F scale, and the K scale. The ? scale is simply a total of the number of omitted items on the test. According to the standard instructions, the subject is told that if a question does not apply to him, or he does not know the answer, he should omit it. A raw score of 30 on the ? scale translates to a T score of 50 which is the norm, thus scores below this number are usually interpreted as indicating that the test has not been seriously affected by the unanswered items (Dahlstrom, Welsh, & Dahlstrom, 1972). It has been postulated that the most likely cause of an excessive number of ? responses indicates that the person taking the test has not understood the content of many of the items (Dahlstrom, Welsh, & Dahlstrom, 1972). In order to control for this possibility, any answer sheet with more than 30 Cannot Say items was eliminated.

The L scale was designed to identify deliberate attempts to avoid answering the test candidly. The content of the items in the L scale deals with such things as poor self-control, aggression, and minor dishonesties, which are common faults of many people. By answering False to an inordinate number of these items, subjects are perceived as deliberately trying to project an enhanced

image of themselves and, therefore, their answers on other test items may be suspect. To help control for this possibility, profiles with a raw score of 7 or more on the L scale were examined and those evidencing deliberate misrepresentation were eliminated.

The F scale is commonly known as the validity scale, but has also been designated the Frequency scale and the Confusion scale. It was originally designed to detect idiocyncratic response patterns, such as answering all True or all False. Profiles which had an F score of 11 or more were examined and, if unusual response patterns were evident which indicated invalid test results, those profiles were eliminated.

The fourth validity check, the K scale, was developed after it was found that the other three failed to detect subtle violations of administration protocol. According to Dahlstrom, Welsh, and Dahlstrom (1972):

> The research leading to the development of the K scale was devoted to increasing the sensitivity of the validity indices on the test, to identifying the impact of more subtle score-enhancing or score-diminishing factors, and to providing a means of statistically correcting the values of the clinical scales themselves to offset the effects of these factors on the clinical profile. (p. 120)

The number of cases eliminated due to validity scale violations is shown in Table 1. Of these, the MBD and LD subjects were eliminated for violations of the Cannot Say

scale, while in the BD group, one elimination was for a violation of the Cannot Say scale, two were for violations of the F scale, and one profile had violations of the F, L and K scales.

In addition to the standard validity and clinical scales of the MMPI, seven clinical subscales were chosen for examination in order to delineate better any emotional problems manifested by the subjects. These subscales are: Subjective Depression D1, Mental Dullness D4, Brooding D5, Denial of Social Anxiety Hy1, Social Alienation Pd4A, Lack of Ego Mastery, Conative Sc2B, and Ego Strength Es. The first six of these subscales were constructed from the MMPI clinical scales by Harris and Lingoes (1965, 1968) and were chosen to clarify statements of unhappiness, lack of self-confidence, feelings of inferiority, brooding, and social alienation expected to be found in the learning disabled groups. These subscales are among many used widely in clinical practice and have been found to have a high degree of internal consistency (Gocka, cited in Graham, 1977), as well as correlating with factors derived from the MMPI such as neuroticism, shyness and paranoia (Comrey, cited in Graham, 1971; Comrey and Marggraff, cited in Graham, 1977). The Ego Strength subscale (Barron, 1953) was originally constructed for the purpose of predicting response to psychotherapy. Further research (Barron, 1953, 1956; Dahlstrom, Welsh, & Dahlstrom, 1975; Duckworth & Duckworth, 1975; Good & Brantner, 1961; Quay, 1955) showed high scores on the scale

to be positively correlated with a wide variety of valued personal traits, for example, personal stability, independence of judgment, and ease and effectiveness in social situations. In clinical settings it has come to be considered a measure of psychological adjustment; high scorers are unlikely to have serious emotional problems. Appendix B lists descriptors of individuals scoring in the clinical direction on these subscales (Graham, 1977).

It was not expected that there would be a large number of severely disturbed subjects, and although the learning handicapped groups were predicted to have elevated scores in relation to controls, it was not thought that the MMPI scales would show up more subtle group differences in emotional status. The subscales were chosen because they were believed to be more sensitive to the type of emotional difficulties expected to be found in the subjects, such as shyness and general unhappiness. Although it was not expected that blatant psychopathology would be evidenced by the learning handicapped groups, it was expected that they would display increased maladjustment in the more ordinary aspects of their everyday emotional status.

The MMPI booklet and answer sheet, along with an envelope addressed to the University of Victoria Neuropsychology Clinic, were given to the subject at the end of a day's testing. The subject was given the standard verbal instructions, along with written instructions on how to take the test and how to mark the answer sheet (see Appendix C for instructions). Most subjects completed the

first 10 items in the Clinic to insure they understood the instructions. Five of the subjects from the BD group had problems such as spasticity which were severe enough to hinder them from marking the answer sheets. These subjects were given the MMPI in the clinic with the help of a research assistant. Occasionally it was suggested that the help of a family member or friend be obtained to read the test items, but it was cautioned that this person not interpret the items or influence the subject's answers in any way. The subject was requested to complete the MMPI as soon as possible and return it to the Clinic. This procedure was necessary because of the time demands of a full day of neurological and psychological examinations, and follow-up interview. It is possible that taking the MMPI at home may, in fact, influence the results to some extent.

Outcome Variables

The outcome variables were the scores on the validity and clinical scales of the MMPI, as well as the scores on the designated clinical subscales.

Statement of Hypotheses

Hypothesis 1: MMPI scales

It was hypothesized that the three learning handicapped groups would be significantly different from the controls but not from each other on the MMPI scales. Hypothesis 1 was based on the premise that the presence of a learning disability, with or without brain damage, sets the stage for a lifelong pattern of academic failure. This failure, in turn, causes disappointment and lack of approval on the part of many parents and peers, and leads to low self-esteem, feelings of frustration, anxiety, and depression in the learning disabled individual.

Hypothesis 2: Clinical subscales

It was expected that the subscales which were chosen would clarify any differences between the groups, and that a linear trend of increasing maladjustment would be shown from the controls through the LD and MBD groups, with the BD group showing the most disturbed profile.

CHAPTER III

Results

Hypothesis 1: MMPI Scales

This hypothesis predicted that the three learning disabled groups would differ from the controls, but not from each other on the MMPI scales. A multivariate analysis of variance of the 3 validity and 10 clinical scales produced significant group separation, Wilks Lambda (13,3,406)=.565, F=2.22, $p<.001$. Figure 1 shows profiles of groups' mean scores. Further analyses provided univariate F tests for each of the scales, which were significant for all except Hysteria Hy , Masculinity-Femininity Mf , and Hypomania Ma (see Table 2). It is noted that almost all scales show at least slightly elevated scores, even the control group. This is the result of (a) an outdated (1943) standardization base for the MMPI, and (b) the fact that slightly elevated scores are quite common in young adults.

Figure 1: Profile of Groups' Mean T-Scores on MMPI Scales

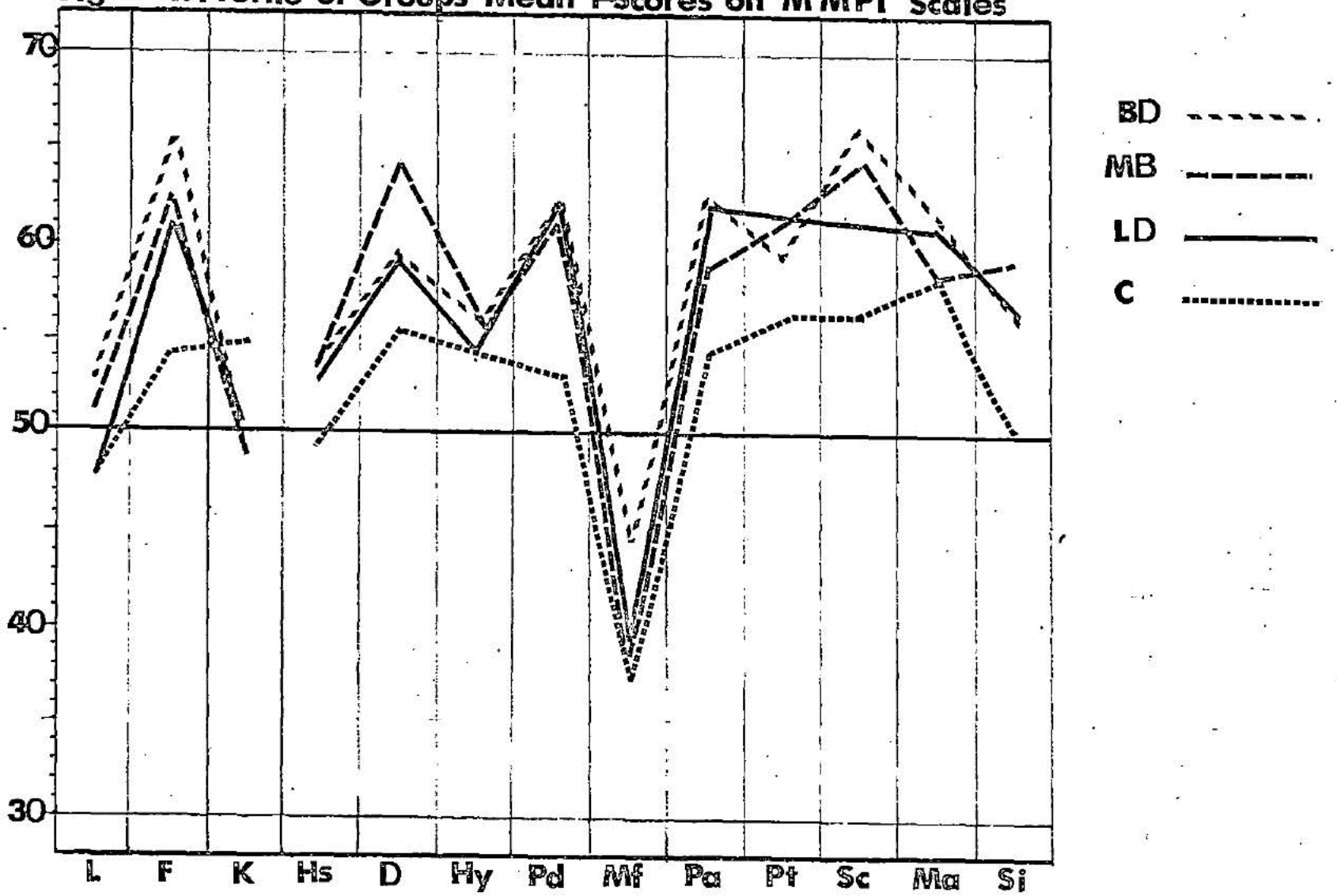


Table 2

Univariate F-Tests on MMPI Scales with (3,149) d.f.

Scale	F	Significance of F
L	4.213	.007
F	7.394	.000
K	2.830	.040
Hs	3.157	.027
D	3.038	.031
Hy	.120	.948 NS
Pd	6.395	.000
Mf	.997	.396 NS
Pa	3.558	.016
Pt	3.019	.032
Sc	6.193	.001
Ma	1.692	.171 NS
Si	3.595	.015

Group comparisons on the MMPI scales showed significant differences between the control and the BD and MBD groups, Wilks Lambda (13,1,75)=.533, F=5.06, $p<.001$ and Wilks Lambda (13,1,79)=.649, F=3.28, $p<.01$, respectively, but no significant separation between the control and the LD groups. However, the LD group did present slightly higher scores on all scales except K , Hy and Mf . The

BD group also was significantly different from the LD group, whereas the other group comparisons did not reach significance (Table 3).

Table 3

Wilks F-Test for Group Comparisons on MMPI Scales

Groups	Significance of F
C vs BD	.000
C vs MBD	.001
C vs LD	.182 NS
LD vs BD	.049
LD vs MBD	.178 NS
MBD vs BD	.322 NS

This hypothesis was partially confirmed in that the two groups with neurological signs (BD and MBD) did differ from controls, but not from each other. However, between the LD group and the controls a significant separation was not found, although scores on most scales were higher for the LD group. Although there was an overall significant difference between the BD and LD groups, Wilks Lambda $(13,1,46)=.645$, $F=1.95$, $p<.05$, univariate F-tests showed

significant separation on the L scale only, Wilks Lambda F (1,58)=4.32, p<.05.

Hypothesis 2: Clinical Subscales

This hypothesis predicted a clear picture of increasing maladjustment from the control group through the LD and MBD groups to the BD group.

A multivariate analysis of variance of the subscale scores showed significant group separation, Wilks Lambda (7,3,411)=.788, F =1.69, p<.05. See Figure 2. The only subscale not reaching significance was Denial of Social Anxiety Hy1 (Table 4).

Figure 2: Profile of Groups' Mean T-Scores on Clinical Subscales

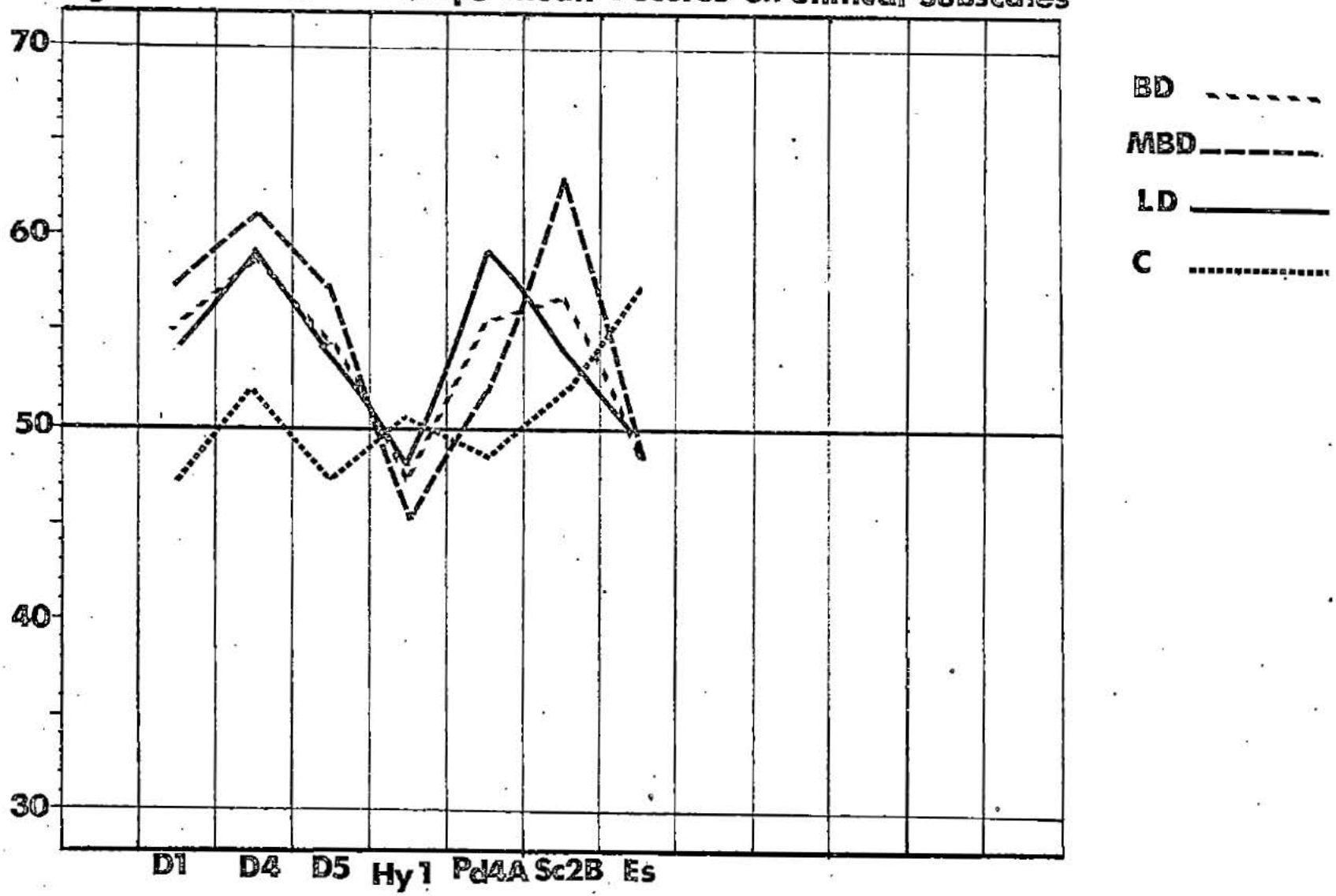


Table 4

Univariate F-Tests on MMPI Subscales with (3,149) d.f.

Scale	F	Significance of F
Subjective Depression D1	3.548	.016
Mental Dullness D4	3.850	.011
Brooding D5	3.727	.013
Denial of Social Anxiety Hy1	.116	.951 NS
Social Alienation Pd4A	3.883	.010
Lack of Ego Mastery Sc2B	3.973	.009
Ego Strength Es	6.914	.000

Group comparisons of subscale scores showed essentially the same pattern as on the MMPI scales. There was a significant separation between the control and the BD and MBD groups, Wilks Lambda (7,1,81)=.768, F =3.49, $p<.01$ and Wilks Lambda (7,1,85)=.824, F =2.59, $p<.05$, respectively), but the difference between the control and the LD groups failed to reach significance. There were no significant differences among the three learning handicapped groups (Table 5).

Table 5

Wilks F-Test for Group Comparisons on Clinical Subscales

Groups	Significance of F
C vs BD	.003
C vs MBD	.018
C vs LD	.106 NS
LD vs BD	.716 NS
LD vs MBD	.616 NS
MBD vs BD	.554 NS

Again, the hypothesis was partially supported in that the three learning handicapped groups exhibited scores further in the maladjusted direction than the control group on all scales. However, the expected clearcut picture of increasing maladjustment from controls through to the BD group was not completely evidenced. On five of the seven subscales (Subjective Depression, Mental Dullness, Brooding, Denial of Social Anxiety and Lack of Ego Mastery), the MBD group scored further in the clinical direction than the BD group, and on the Ego Strength subscale, the scores for these two groups were the same

(Figure 2).

Other Analyses

As was clear from the studies cited in the literature review, there is much speculation about the possible connection between learning disabilities, hyperactivity, CNS dysfunction, and serious psychiatric disturbances. In an attempt to check the incidence of high-point profiles which might be indicative of psychopathology, certain scales were investigated for T values of 70 or more. Three scales sometimes associated with hyperactivity and/or sociopathy are Psychopathic Deviate Pd , Schizophrenia Sc and Hypomania Ma , and the percentage in each group of scores over 70 on these scales is shown in Table 6 and Figure 3. Further scrutiny revealed that there were only two profiles with elevations on all three of these scales, and they were both in the LD group. None of the profiles showed the classic sociopathic pattern of elevated scores on the Pd and Ma scales.

Since Peter and Spreen (1979) found different levels of emotional maladjustment to be related to the sex of the subjects (females being less well adjusted than males), a separate analysis of the scores was carried out for both sexes. On the MMPI scales, the result for the males did not reach significance, Wilks Lambda (13,3,273)=.581, F =1.41, $p<.07$, whereas the result for the females was significant Wilks Lambda (13,3,87)=.185, F =1.71, $p<.03$. Analysis of the subscale scores demonstrated the same basic

pattern: scores for males did not achieve significant separation, Wilks Lambda $(7,3,282)=.785$, $F=1.18$, $p<.27$, whereas those of the females did, Wilks Lambda $(7,3,101)=.323$, $F=2.28$, $p<.01$.

Figure 3: T-Scores >70 on MMPI Scales Hs, D, Hy, Pd, Sc, Ma

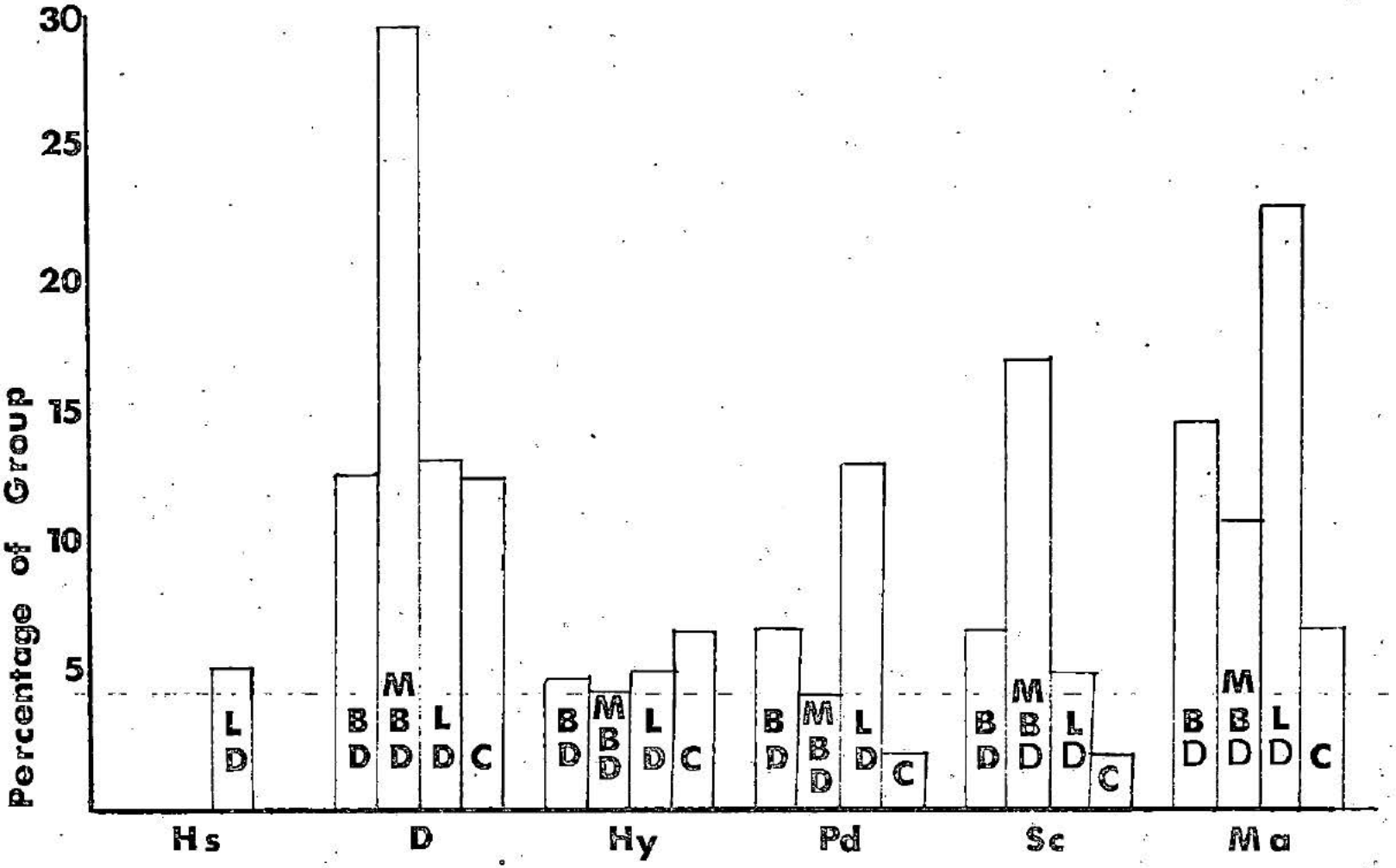


Table 6

Profiles with Scores over 70 on Scales Pd, Sc, and Ma

Scale	Number of profiles		Group	%
	Male	Female		
Pd	2	1	BD	7
	1	1	MBD	4.3
	2		LD	11.8
	1		C	2.2
Sc	3		BD	7
	7	1	MBD	17
	1		LD	5.9
	1		C	2.2
Ma	5	1	BD	14
	5		MBD	10.6
	4		LD	23.5
	2	1	C	6.5

In looking at the three scales composing the so-called "neurotic triad", i.e. Hypochondriasis Hs , Depression D and Hysteria Hy , only one profile had T scores over 70 on all three scales and it was also from the LD group. Percentage breakdown by group for scores over 70 on these three scales is shown in Table 7 and Figure 3.

Table 7

Profiles with Scores over 70 on Scales Hs, D, and Hy

Scale	Number of profiles		Group	%
	Male	Female		
Hs	1		BD	5.9
D	3	2	BD	11.6
	11	3	MBD	29.8
	2		LD	11.8
	4	1	C	10.9
Hy		2	BD	4.7
	1	1	MBD	4.3
	1		LD	5.9
	2	1	C	6.5

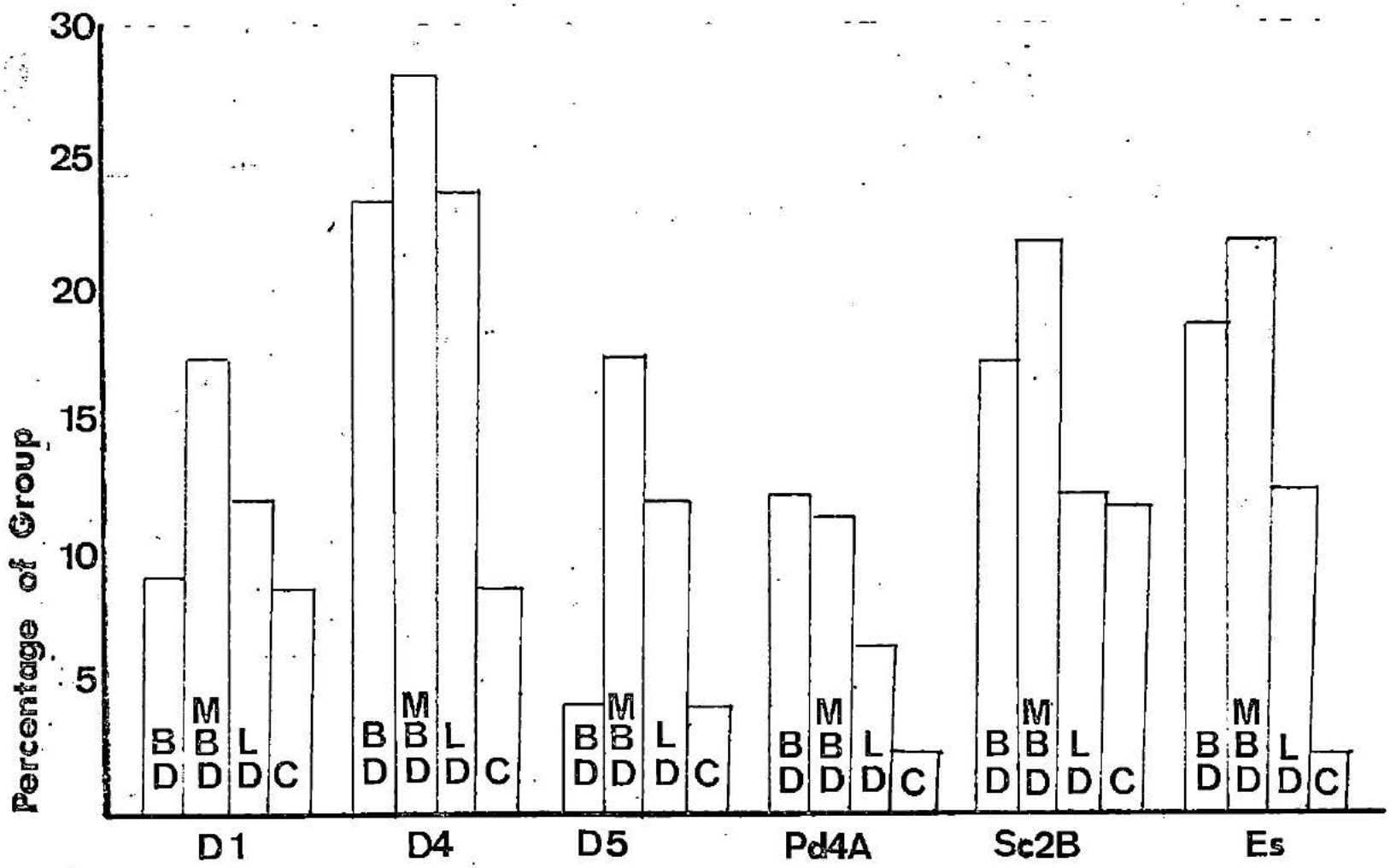
The significant subscale scores were also examined to discover the number of profiles in each group scoring in the more disturbed range (T score greater than 70 on Subjective Depression, Mental Dullness, Brooding, Social Alienation and Lack of Ego Mastery, Conative, and less than 40 on Ego Strength). These percentages are shown in Table 8 and Figure 4.

Table 8

Profiles with Scores in the Disturbed Range on the Clinical Subscales

Scale	Number of profiles		Group	%
	Male	Female		
Subjective Depression D1	4		BD	9.3
	6	2	MBD	17
	2		LD	11.8
	3	1	C	8.7
Mental Dullness D4	8	2	BD	23.3
	8	5	MBD	27.7
	2	2	LD	23.5
	3	1	C	8.7
Brooding D5	2		BD	4.7
	6	2	MBD	17
	2		LD	11.8
	1	1	C	4.3
Social Alienation Pd4A	3	2	BD	11.6
	4	1	MBD	10.6
	1		LD	5.9
	1		C	2.2
Lack of Ego Mastery Sc2B	4	3	BD	16.3
	6	4	MBD	21.3
	2		LD	11.8
	5		C	10.9
Ego Strength Es	6	2	BD	18.6
	8	2	MBD	21.3
	2		LD	11.8
	1		C	2.2

Figure 4: T-Scores in Disturbed Range on Significant Subscales



CHAPTER IV

Discussion

Hypothesis 1: MMPI Scales

The partial confirmation of this hypothesis lends weight to growing evidence that the presence of a learning handicap in childhood, at least when accompanied by some evidence of brain dysfunction, is associated with emotional concomitants which persist into adulthood. In the present study, there was a clear separation of the groups formed on the basis of neurological impairment. The MBD group, even though distinguished only by "soft" neurological signs, was obviously different from the control group, supporting previous findings indicating a higher incidence of neurological soft signs in disturbed populations. Thus, it can be concluded that the presence of neurological impairment even as elusive as soft signs in a group of learning handicapped subjects is an identifying factor for groups scoring further in the disturbed direction than normals on the MMPI.

When examining the results of comparisons between the LD group and the other groups, the distinction becomes somewhat blurred. While the LD group was not clearly separated from the controls, examination of the scores showed the LD group to be more in the disturbed direction

than controls on most scales and, although not completely identified with the neurologically impaired groups, the LD group scores tended to fall in that range. This suggests that while a learning disability, even without brain damage, contributes to the elevation of MMPI scores, it does not bring about a blatantly abnormal profile such as might be predicted from other research. This result is not surprising when it is taken into consideration that the groups presently under study, unlike others in the research literature, are not drawn from psychiatric referral populations. Profiles showed highest elevation of scales D and Sc, but also elevations on scales Pd, Pa, and Pt. While none of these elevations reached the range of clinical significance (T >70), it suggests a considerable amount of depression, abnormal thought content and general overexcitability in this population which is apparently present in all formerly learning handicapped groups.

Hypothesis 2: Clinical Subscales

The partial confirmation of this hypothesis also supports the theory that learning handicapped groups, with or without demonstrable brain damage, are generally unhappier and less well-adjusted than those without learning difficulties. However, in this study, the BD group did not, as expected, prove to be the most maladjusted. The MBD group scored further in the disturbed direction on the five subscales which seem to describe

someone who is unhappy, depressed, lacking energy and the ability to concentrate, feeling inferior and lacking self-confidence. While this pattern may be suggestive of someone who is socially introverted, the lower score on the Social Alienation Pd4A scale indicated that the person does not blame other people for his or her problems and is not insensitive to others. The LD group, conversely, scored highest on the Social Alienation scale, which describes an individual whose feelings of estrangement and alienation are perceived as being caused by others and who blames other people for his difficulties. On the Ego Strength subscale, which is taken as a measure of emotional well-being, 21.3% of the MBD group scored below a T value of 40, with the norm at 50 and higher scores indicative of better psychological adjustment (Figure 4). The lack of a significant difference among the three learning handicapped groups on these subscales again supports the evidence that the presence of a learning disability in itself is enough to cause feelings of anxiety, depression and inadequacy to a greater extent than is found in the non-handicapped population. The fact that those with MBD apparently feel less emotionally well-adjusted than those with hard evidence of brain damage might be partially explained by the fact that members of this group cannot readily ascribe their problems to an obvious deficit as can those with brain damage, which is often accompanied by such things as paralysis of the limbs or seizures. The term "minimal" in itself suggests that what is physically wrong is of a minor

nature and the person may thus be doubly frustrated and unhappy at his inability to overcome this deficit and succeed in many areas of life. In this context it is interesting to note that the MBD group also had the largest percentage by far (Table 7) of profiles with Depression scale scores over 70 which also contributes to a picture characterized by pessimism, feelings of hopelessness, and possible suicidal thoughts.

The fact that the LD group was found to score higher on the Social Alienation scale seems logical when it is remembered that these people have nothing concrete on which to blame their handicap, not even "minimal" brain dysfunction. In this case it may be a natural inclination to attribute the blame for failures on incompetent teachers or insensitive parents.

General Discussion

It has been argued (Osmon & Golden, 1978) that the most fruitful method of investigating the relationship of personality variables to brain functioning is by first defining the brain-damaged groups by behavioral deficits. In this study, the original referral was for a learning disability (a behavioral deficit). The significant differences among the groups on the outcome variables support the reasoning behind behavioral definitions as group identifying factors, but once again the evidence shows that the presence and extent of neurological

impairment is the most important single prognosticator of future psychological maladjustment within this type of subject population.

One interesting point which became evident during the follow-up was that as a group, the LD people were the most reluctant to be retested. Many did not want to be reminded of their "failings," which were highlighted by many of the test situations. This is perhaps the reason for the disproportionately lower percentage of MMPI's returned by this group (63% as opposed to 85.5%, 81.4% and 92.2% for the BD, MBD and C groups, respectively). This lower return rate by the LD group may also have contributed to the lack of a clear separation from the controls. It is possible that the most severely disturbed people in this group did not return their MMPI's, and this selective attrition caused the group to appear more well-adjusted than they seemed on interview. Corroborative evidence from the interview data, the first follow-up interview, rating scales and adjustment inventory at the first interview tends to support this conclusion (Spreen, 1982). There was a general clinical impression among the researchers that many of these people were poorly adjusted emotionally and socially, and comments by these subjects during the testing sessions supported this view. Once having left the clinic where the research assistant encouraged participation, these people may have been disinclined to struggle through all 566 questions on their own, and also reluctant to seek help from others who were perhaps somewhat unaware of the

extent of their reading difficulty. Another reason for not completing and returning the MMPI may have been the unwillingness on the part of some individuals to be reminded of the past, and the many problems they had encountered during their school years. As one LD subject poignantly stated, "I've made a good life for myself in spite of everything and I don't want to think about things that happened years ago; please leave me in peace."

Sex difference analyses confirmed the previous findings of more maladjustment among females, but while suggestive, the significance of these results is questionable due to the small number of females in the study.

Bender (1949) contends that there is a biological "drive for normality" in every child which is capable in a great number of instances of compensating for many developmental obstacles, including organic brain damage. However, while it may be true that "the final shape of an emotion is never determined by the organic factor alone but by the activity of the total organism and the total personality" (Schilder, 1956, p. 196), it appears that for young learning handicapped adults the state of their emotions, unhappily, is not that of average, non-handicapped adults.

Outlook and Future Studies

Many things require closer scrutiny in the context of this learning handicapped population, and among those to be investigated should be the following:

(1) relation of maladjustment to severity of impairment.

(2) relation of maladjustment to I.Q.

(3) relation of maladjustment to findings on the second neurological examination.

(4) effect of intervention procedures on outcome.

(5) psychopathology in relation to achievement test results at follow-up.

REFERENCES

Balow, B. & Blomquist, M (1965). Young adults ten to fifteen years after severe reading disability. Elementary School Journal , 44-48.

Barron, F. (1953). An ego strength scale which predicts response to psychotherapy. Journal of Consulting Psychology , 17 , 327-333.

Barron, F. (1956). Ego-strength and the management of aggression. In G. S. Welsh & W. G. Dahlstrom (Eds.), Basic Readings on the MMPI in Psychology and Medicine . Minneapolis: University of Minnesota Press.

Bell, H. M. (1962). The Adjustment Inventory. Revised Student Form . Consulting Psychologists Press, Inc.

Bender, L. (1949). Psychological problems of children with organic brain disease. American Journal of Orthopsychiatry , 19 , 404-415.

Borland, B. L. & Heckman, H. K. (1976). Hyperactive boys and their brothers: A 25-year follow-up study. Archives of General Psychiatry , 33 , 669-675.

Bryan, T. & Bryan, J. (1975). Understanding learning disabilities . New York: Alfred Publishing Co.

Connolly, C. (1968). Social and emotional factors in learning disabilities. In H. R. Myklebust (Ed.), Progress in Learning Disabilities . New York: Grune and Stratton.

Cruickshank, W. (1978). Learning disabilities: a definitional statement (Mimeo). Toronto: Canadian Association for Children with Learning Disabilities.

Dahlstrom, W. G., Welsh, G. S. & Dahlstrom, L. E. (1972). An MMPI Handbook. Volume I: Clinical Interpretation . University of Minnesota Press: Minneapolis.

Denhoff, E. (1973). The natural life history of children with MBD. Annals of the New York Academy of Sciences , 205 , 188-205.

Duckworth, J. C. & Duckworth, E. (1975). MMPI Interpretation Manual for Counselors and Clinicians . Muncie, Ind.: Accelerated Development, Inc.

Dykman, R. A., Peters, J. E. & Ackerman, P. T. (1973). Experimental approaches to the study of minimal brain dysfunction: A follow-up study. Annals of the New York Academy of Sciences , 205 , 93-107.

Frost, B. P. (1965). Some personality characteristics of poor readers. Psychology in the Schools , 2 , 218-219.

Good, P. K. & Brantner, J. P. (1961). The Physician's Guide to the MMPI . Minneapolis: University of Minnesota Press.

Graham, J. R. (1977). The MMPI: A Practical Guide . New York: Oxford University Press.

Harris, R. & Lingoes, J. (1965). Subscales for the Minnesota Multiphasic Personality Inventory (Mimeographed materials). The Langley Porter Clinic.

Harris, R. & Lingoes, J. (1965). Subscales for the Minnesota Multiphasic Personality Inventory (Mimeographed materials). The Langley Porter Clinic.

Harshman, R. A., Hampson, E. & Berenbaum, S. A. (1983). Individual differences in cognitive abilities and brain organization, Part 1: sex and handedness differences in ability. Canadian Journal of Psychology , 37 (1), 144-192.

Hartocollis, P. (1968). The syndrome of minimal brain dysfunction in young adult patients. Bulletin of the Menninger Clinic , 32 , 102-113.

Hathaway, S. R. & McKinley, J. C. (1940). A multiphasic personality schedule (Minnesota): I. Construction of the schedule. Journal of Psychology , 10 , 249-254.

Hertzig, M. E. & Birch, H. G. (1966). Neurologic organization in psychiatrically disturbed adolescent girls. Archives of General Psychiatry , 15 , 590-598.

Hertzig, M. E. & Birch, H. G. (1968). Neurologic organization in psychiatrically disturbed adolescents. Archives of General Psychiatry , 19 , 528-537.

Hinton, G. G. & Knights, R. M. (1971). Children with learning problems: academic history, academic prediction and adjustment 3 years after assessment. Exceptional Children , 37 , (7), 513-519.

Kaste, C. M. (1971). A ten-year follow-up of children diagnosed in a child guidance clinic as having cerebral dysfunction (Doctoral dissertation, University of Minnesota, 1971).

Larsen, S. C., Parker, R. & Jorjorian, S. (1973). Differences in self-concept of normal and learning disabled children. Perceptual and Motor Skills , 37 , 510.

Laufer, M. W. & Denhoff, E. (1957). Hyperkinetic behavior syndrome in children. Journal of Pediatrics , 50 , 463-474.

Mendelson, W., Johnson, N. & Stewart, M. A. (1971). Hyperactive children as teenagers: A follow-up study. Journal of Nervous and Mental Disease , 153 , 4.

Menkes, M. M., Rowe, J. S. & Menkes, J. H. (1967). A twenty-five year follow-up study on the hyperkinetic child with MBD. Pediatrics , 39 , 3.

Mindingall, A., Libb, J. W. & Welch, M. (1980). Locus of control and personality functioning of learning disabled children. Journal of Clinical Psychology , 36 , 1, 137-141.

Morrison, J. R. & Menkoff, K. (1975). Explosive personality as a sequel to the hyperactive child syndrome. Comp. Psychiatry , 16 , 343-348.

Orton, S. T. (1937). Reading, Writing and Speech Problems in Children . New York: Norton.

Osmon, D. C. & Golden, C. J. (1978). MMPI correlates of neuropsychological deficits. International Journal of Neuroscience , 8 , 3, 113-122.

Peter, B. & Spreen, O. (1979). Behavior rating and personal adjustment scales of neurologically and learning handicapped children during adolescence and early adulthood: results of a follow-up study. Journal of Clinical Neuropsychology , 1 , 1, 75-92.

Preston, R. & Yarington, D. J. (1967). Status of fifty retarded readers eight years after reading clinic diagnosis. Journal of Reading , 11 , 122-129.

Quay, H. (1955). The performance of hospitalized psychiatric patients on the ego-strength scale of the MMPI. Journal of Clinical Psychology , 11 , 403-405.

Quitkin, F. (1976). Neurological soft signs in schizophrenia and character disorders. Archives of General Psychiatry , 33 , 845-853.

Quitkin, F. & Klein, D. F. (1969). Two behavioral syndromes in young adults related to possible minimal brain dysfunction. Psychiatric Research , 7 , 131-142.

Rawson, M. (1965). Developmental Language Disability: Adult Accomplishment of Dyslexic Boys . Baltimore: Johns Hopkins Press.

Robins, L. N. (1966). Deviant Children Grown Up. Baltimore: Williams & Wilkins.

Robinson, H. M. & Smith, H. K. (1962). Reading clinic clients - ten years after. The Elementary School Journal , 63 , 22-27.

Schilder, P. (1956). In Bender, L., (Ed.), Psychopathology of Children with Organic Brain Disorder . Springfield, Ill.: C. C. Thomas.

Spreen, O. (1976). Post conference review. In R. M. Knights and D. J. Bakker (Eds.), Neuropsychology of Learning Disorders (pp.445-467). Baltimore, Maryland: University Park Press.

Spreen, O. (1982). Adult outcome of reading disorders. In R. N. Malatesha and P. D. Aaron (Eds.), Reading Disorders Varieties and Treatments (pp.473-498). New York: Academic Press.

Spreen, O. (1983). Learning Disabled Children Growing Up: A Follow Up into Adulthood. University of Victoria Monograph.

Stewart, M., Pitts, F., Craig, A. & Dieruf, W. (1966). The hyperactive child syndrome. American Journal of Orthopsychiatry , 36 , 861-867.

Trites, R. L. & Fiedorowicz, C. (1976). Follow-up study of children with specific (or primary) reading disability. In R. M. Knights & D. J. Bakker (Eds.), Neuropsychology of Learning Disorders (pp.41-50). Baltimore, Maryland: University Park Press.

Wallace, G. & Kaufman, J. (1973). Teaching Children with Learning Problems . Columbus, O: Charles E. Merrill.

Weiss, G., Minde, K., Werry, J. S., Douglas, V. & Nemeth, E. (1971). Studies on the hyperactive child. Five-year follow-up. Archives of General Psychiatry , 24 , 409-414.

Wender, P. H. (1971). Minimal Brain Dysfunction in Children . New York: John Wiley and Sons.

Wender, P. H. (1975). The minimal brain dysfunction syndrome. Annual Review of Medicine , 26 , 45-62.

Yule, W. & Rutter, M. (1968). Educational aspects of childhood maladjustment: some epidemiological findings. British Journal of Educational Psychology , 38 , 7-9.

APPENDIX A

"Hard" and "Soft" Neurological Signs

"HARD" NEUROLOGICAL SIGNS

Sensori-Motor or Structural

1. plegia
2. asymmetrical paresis
3. definite abnormalities of resting muscle tone (spasticity, hypotonus)
4. hyperactive tendon reflexes (grade 2 asymmetrical or grade 3 bilateral)
5. marked choreiform movements
6. marked athetosis
7. marked ataxia
8. marked disdiadochokinesia (alternating movements)
9. abnormal heel - knee testing (grade 2)
10. marked incoordination (if not specified as either No. 7, No. 8, or No. 9)
11. marked tremor
12. Babinski sign (extensor)
13. severe dysarthria
14. loss of upper gaze
15. marked anaesthesia
16. unilateral simultagnosia (loss of two-point discrimination)
17. diplopia
18. visual field defect
19. diagnosis of cerebral palsy
20. concrete evidence of brain damage (tumor, cyst, hematoma) in absence of specific signs

Cognitive-perceptual

21. aphasia

EEG Abnormalities

22. EEG dysrythmia - grade 3 focal or unilateral

23. EEG data - grade 3 diffuse or grade 2 or 3 focal or unilateral (except grade 2 posterior)

Hyperactivity

24. severe hyperactivity of apparent neurological origin

"SOFT" NEUROLOGICAL SIGNS

Sensori-Motor or Structural

1. clumsiness of gross or fine motor movements
2. slightly hyperactive or diminished tendon reflexes (grade 1 or 2)
3. slight asymmetry of tone or reflexes
4. slight choreiform movements of fingers
5. slight athetosis
6. slight bilateral weakness
7. mild ataxia
8. mild tremor
9. slight disdiadochokinesia
10. poor speech articulation
11. graphaesthesia
12. strabismus, nystagmus, or saccadic movements
13. asymmetry of skull or limbs

Cognitive-perceptual

14. impaired position sense
15. dyspraxia of tongue movements
16. finger agnosia
17. language development at the time of the examination

EEG Abnormalities

18. EEG dysrythmia - grade 2 or 3 diffuse, or grade 1 or 2 focal or unilateral
19. EEG delta - grade 1 or 2 diffuse, grade 2 posterior, or grade 1 focal or unilateral

Hyperactivity

20. mild to moderate hyperactivity (not judged to be primarily psychological)

APPENDIX B

Subscale Descriptors

DESCRIPTORS OF INDIVIDUALS SCORING IN THE DISTURBED DIRECTION ON THE CLINICAL SUBSCALES

Subjective Depression (D1). Descriptors of a high scorer on this subscale:

1. feels unhappy, blue or depressed much of the time
2. lacks energy for coping with problems of everyday life
3. not interested in what goes on around him
4. feels nervous or tense much of time
5. has difficulties in concentrating and attending
6. has a poor appetite and trouble sleeping
7. broods and cries frequently
8. lacks self-confidence
9. feels inferior and useless
10. easily hurt by criticism
11. feels uneasy, shy and embarrassed in social situations
12. tends to avoid interactions with other people, except for relatives and close friends
13. if a hospitalized psychiatric patient, likely to receive a diagnosis of depressive neurosis.

Mental Dullness (D4). Descriptors of a high scorer on this subscale:

1. lacks energy to cope with problems of everyday life
2. feels tense
3. complains of difficulties in concentrating
4. complains of poor memory and judgment
5. lacks self-confidence
6. feels inferior to others
7. gets little enjoyment out of life
8. appears to have concluded that life is no longer worthwhile.

Brooding (D5). Descriptors of a high scorer on this subscale:

1. broods, ruminates, and cries much of the time
2. lacks energy to cope with problems
3. seems to have concluded that life is no longer worthwhile
4. feels inferior, unhappy, and useless
5. easily hurt by criticism
6. feels that he is losing control of his thought processes.

Denial of Social Anxiety (Hy1). Descriptors of low scorer on this subscale:

1. socially introverted
2. shy and bashful in social situations
3. finds it difficult to talk with other people
4. greatly influenced by social standards and customs.

Social Alienation (Pd4A). Descriptors of a high scorer on this subscale:

1. feels alienated, isolated, and estranged
2. believes that other people do not understand him
3. feels lonely, unhappy and unloved
4. feels that he gets a raw deal from life
5. blames other people for his problems and shortcomings
6. concerned about how other people react to him
7. self-centered and insensitive to the needs and feelings of others
8. acts in inconsiderate ways toward other people
9. verbalizes regret and remorse for his actions.

Lack of Ego Mastery, Conative (Sc2B). Descriptors of a high scorer on this subscale:

1. feels that life is a strain; admits feelings of depression and despair
2. has difficulty in coping with everyday problems; worries excessively
3. responds to stress by withdrawing into fantasy and daydreaming
4. does not find his daily activities interesting and rewarding
5. has given up hope of things getting better
6. may wish that he were dead.

Ego Strength (Es). Descriptors of a low scorer on this subscale:

1. has poor self-concept; feels worthless; broods
2. feels helpless
3. confused
4. has chronic physical complaints
5. has chronic fatigue
6. has fears, phobias
7. withdrawn, seclusive
8. inhibited, unadaptive
9. shows stereotyped, unoriginal approach to problems
10. mannerly, mild
11. has fundamental religious beliefs
12. rigid, moralistic
13. if male, has effeminate style of behavior
14. exaggerates problems as "cry for help"
15. has a poor work history

16. has problems that are characterological rather than situational in nature
17. expresses good intentions to change in psychotherapy but does not act on them.

APPENDIX C

MMPI Instructions

INSTRUCTIONS TO SUBJECTS TAKING THE MMPI

Verbal Instructions

This is the last task. It is a long questionnaire which will take about an hour to complete. When you read the questions you will realize that this test is quite out of date and some of the questions are pretty stupid. But don't worry or fret about that - just mark each question true or false; and try to answer the question right away - without thinking or mulling over the answer. It's your gut or first reaction that is important. I know you will probably be tired tonight and won't feel like doing this, but if you could possibly complete it in the next few days and mail it back to us right away we would really appreciate it.

Written Instructions

This test takes about one hour to complete. It is best if you do it all at once. Please answer <u>every</u> question quickly, following your first reaction. Do not spend a lot of time thinking about each question. The rows on the answer sheet (single sheet with purple numbers) go <u>down</u> the page. As there are a lot of questions and it is easy to miss one, please check that the question and the number you are marking are the same. The test is invalid, if, for example, you read number 7 but mark your answer under number 8. As you can see, each question is answered TRUE (T) or FALSE (F).

This test was developed many years ago and contains some very old-fashioned statements which are not relevant to the 1980's. In fact, people often find some of the questions just plain silly. Very rarely a person will feel angry or upset after reading an item. We hope this will not happen with you. We still use the test, even though it is a little out-of-date, because it is still the best inventory of questions available.

When you have finished, just put the question booklet and answer sheet in the envelope (which is already stamped and addressed) and mail it. Both question booklet and answer sheet should be returned. We are grateful for your cooperation.

Once again, thank you very much for participating in this study.

VITA

Surname: Russell Given Names: Vivian Phylis Marie

Place of Birth: Cartwright, Labrador, Nfld.

Educational Institutions Attended, with Dates of Entering and Leaving:

Saint Mary's University	1977 to 1981
University of Victoria	1981 to 1984
	to

Degrees, Diplomas, Etc., Awarded, with Dates and Names of Institutions:

B.A. (1st Class Honors)	1981	Saint Mary's University

Honors and Awards:

Achievement Scholarships, Saint Mary's University,

1978/79, 1979/80, 1980/81

Dean's List, Saint Mary's University, 1979, 1980, 1981

Graduate Fellowship, University of Victoria, 1981/82

Publications:

PARTIAL COPYRIGHT LICENSE

I hereby grant the right to lend my thesis or dissertation (the title of which is shown below) to users of the University of Victoria Library, and to make single copies only for such users or in response to a request from the library of any other university, or similar institution, on its behalf or for one of its users. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by me or a member of the University designated by me. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Title of Thesis/Dissertation

The Emotional Adjustment of a Learning Disabled Population in Adulthood, as Measured by the Minnesota Multiphasic Personality Inventory

Author [redacted]

Vivian Russell
Name (typewritten)

May 2, 1984
Date