34512

National Library of Canada | Bibliothèque nationale du Canada

CANADIAN THESES ON MICROFICHE | *THÈSES CANADIENNES SUR MICROFICHE*

NAME OF AUTHOR/*NOM DE L'AUTEUR* Denele Elaine Walsh

TITLE OF THESIS/*TITRE DE LA THÈSE* A Descriptive Survey of Fourteen Multiple Sclerosis Patients in Edmonton

UNIVERSITY/*UNIVERSITÉ* University of Alberta

DEGREE FOR WHICH THESIS WAS PRESENTED/ *GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE* M. Ed.

YEAR THIS DEGREE CONFERRED/*ANNÉE D'OBTENTION DE CE GRADE* 1977

NAME OF SUPERVISOR/*NOM DU DIRECTEUR DE THÈSE* Dr. John G. Paterson

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

*L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE DU CANADA de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.*

*L'auteur se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans l'autorisation écrite de l'auteur.*

DATED/*DATÉ* Oct 13, 1977 SIGNED/*SIGNÉ* Denele E Walsh

PERMANENT ADDRESS/*RÉSIDENCE FIXE* 83 St. George's Crescent
Edmonton, Alberta
T5N 3M7

NL-91 (3-74)

# NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED

# AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE

THE UNIVERSITY OF ALBERTA

# A DESCRIPTIVE SURVEY OF FOURTEEN MULTIPLE SCLEROSIS PATIENTS IN EDMONTON

by

© DENELE ELAINE WALSH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION

IN

SCHOOL PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1977

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Descriptive Survey of Fourteen Multiple Sclerosis Patients in Edmonton submitted by Denele Elaine Walsh in partial fulfilment of the requirements for the degree of Master of Education in School Psychology.

J. G. Patterson
Supervisor

Sharon L. Robertson

T. Anderson, M.D.

Date Oct/77

TO

HERMAN AND LYNN

"Do not look back. And do not dream about the future either. It will neither give you back the past, nor satisfy your other day dreams. Your duty, your reward - your destiny - are here and now."

Dag Hammarskjöld
Markings (1963)

## ABSTRACT

Although multiple sclerosis (MS) has been known for over a century, the disease remains a mystery. The symptoms are unpredictable, vacillating, and individualistic. All aspects of daily life are affected by the disease.

The purpose of this descriptive study was to provide current, local information describing the characteristics of MS patients in Edmonton. Psychological assessment of intellect, levels of anxiety, and personality characteristics was conducted by administering the Wechsler Adult Intelligence Scale (WAIS), the IPAT Anxiety Scale Questionnaire (IPAT), and the Minnesota Multiphasic Personality Inventory (MMPI) to the 14 volunteer patients (10 females and 4 males).

Demographic information was categorized into three sections consisting of personal data, background data, and MS medical data. Examination of the psychological data collected indicated that MS patients in this sample had higher Verbal IQ scores than Performance IQ scores; average Full Scale IQ scores, low Digit Span and performance subtests (except Picture Completion) scores, high Comprehension and Similarities scores on the WAIS. On the IPAT, mean scores were in the average to borderline high range for anxiety with males scoring somewhat higher than females. Examination of the mean MMPI profiles indicated that clinically significant T scores existed on the neurotic triad (Hypochondriasis, Depression, and Hysteria) and on the Schizophrenia scale for MS patients. The Psychasthenia score was elevated for the male subgroup of the sample, but not for the female subgroup.

Generally, the results indicated that females appear more

likely to volunteer for research than males and females also tend to seek early assistance with medical problems. Further research involving an equal ratio of males and females in the sample was suggested. Essentially the present MS sample was found to be similar to other MS research samples on psychological tests, therefore confirming the need for therapeutic programs for the MS patients and for additional means for educating the public. Research using a longitudinal study to determine the relationship between the disease and any mental deterioration was also suggested.

ACKNOWLEDGEMENTS

Sincere thanks from the author to the following people for their time, patience, and constructive criticism: Dr. T. Alex McPherson, Dr. Sharon Robertson, and Supervisor, Dr. John Paterson. Extra and special thanks are given to "Dr. John" for his constant and warm encouragement--he made it all happen! As well, appreciation is extended to the Alberta Mental Health Research Fund for financial assistance; to Mrs. E. LaForge, Executive Director, Prairie Division, MS Society of Canada; my very special "14 MS patients" in Edmonton; and my typists--Margaret, Lynn, Maureen, and Marlene.

The author gratefully acknowledges the personal support from "Because--just once," who will never know the extent of this support; fellow students and friends who were so understanding; and my parents along with all my family on both sides.

But mostly to you, Roger . . .

TABLE OF CONTENTS


| CHAPTER | | PAGE |
|---|---|---|
| I. | THESIS INTRODUCTION | 1 |
| | Introduction to the Problem | 1 |
| | Nature of the Problem | 2 |
| | Background of the Study | 5 |
| | Purpose of the Study | 8 |
| | Definition of Terms | 9 |
| | Anxiety | 10 |
| | State-Anxiety | 10 |
| | Trait-Anxiety | 10 |
| | Descriptive Survey | 10 |
| | Exacerbation | 10 |
| | Intelligence (IQ) | 10 |
| | Multiple Sclerosis | 11 |
| | Remission | 11 |
| | Personality Characteristics | 11 |
| | Organization of the Study | 11 |
| | Thesis Overview | 12 |
| II. | MULTIPLE SCLEROSIS | 13 |
| | Introduction to the Disease | 13 |
| | Historical Retrospect | 13 |
| | Ecology | 15 |
| | Geography | 15 |
| | Seasonal Influences | 16 |
| | Racial Influences | 16 |

CHAPTER PAGE

Onset Age . . . . . 17
Urban-Rural Differences . . . . . 17
Sex . . . . . 17
Etiology . . . . . 18
Clinical and Pathological Descriptions . . . . . 20
Symptoms, Signs, and Diagnosis . . . . . 22
Medical, Social, and Psychological Effects . . . . . 24
Treatment . . . . . 26
Drug Therapy . . . . . 26
Rehabilitative Therapy . . . . . 27
Electrical Stimulation . . . . . 27
Dietary Therapy . . . . . 28
Acupuncture . . . . . 28
Surgical Controls . . . . . 28
Summary . . . . . 28
III. REVIEW OF THE RELATED LITERATURE . . . . . 29
Introduction . . . . . 29
Choice of Test Instruments . . . . . 30
Intellectual Assessment of MS Patients . . . . . 31
Personality Characteristics of MS Patients . . . . . 41
Anxiety of MS Patients . . . . . 46
IV. DESIGN AND PROCEDURES . . . . . 51
Population and Sample . . . . . 51
Target Sample . . . . . 51
Study Sample . . . . . 52

CHAPTER PAGE

Procedure for Data Collection . . . . . 53

Test Instruments . . . . . 54

The Wechsler Adult Intelligence Scale . . . . . 55

Verbal Tests . . . . . 55

Performance Tests . . . . . 56

WAIS Assessment Trends for MS Patients . . . . . 58

Minnesota Multiphasic Personality Inventory . . . . 59

IPAT Anxiety Scale Questionnaire (ASQ) . . . . . 64

Demographic Data . . . . . 68

Research Questions . . . . . 68

Question 1 . . . . . 68

Question 2 . . . . . 69

Question 3 . . . . . 69

Question 4 . . . . . 69

Question 5 . . . . . 69

Question 6 . . . . . 69

Question 7 . . . . . 69

Question 8 . . . . . 69

Analysis of Data . . . . . 70

Limitations of the Study . . . . . 70

Summary . . . . . 70

V. RESULTS . . . . . 71

Introduction . . . . . 71

Demographic Data . . . . . 71

Research Questions . . . . . 82

CHAPTER PAGE

Question 1 . . . . . 82

Conclusion . . . . . 82

Question 2 . . . . . 86

Conclusion . . . . . 86

Question 3 . . . . . 86

Conclusion . . . . . 89

Question 4 . . . . . 89

Conclusion . . . . . 89

Question 5 . . . . . 89

Conclusion . . . . . 93

Question 6 . . . . . 95

Conclusion . . . . . 95

Question 7 . . . . . 95

Question 8 . . . . . 95

Conclusion . . . . . 99

Summary . . . . . 102

VI. DISCUSSION AND CONCLUSIONS . . . . . 103

Demographic Data . . . . . 103

Research Questions . . . . . 105

Wechsler Adult Intelligence Scale (WAIS) . . . . . 105

IPAT Anxiety Scale Questionnaire (Self Analysis Form) . . . . . 107

Minnesota Multiphasic Personality Inventory (MMPI) . . . . . 108

Implications for Future Research . . . . . 111

Summary . . . . . 113

CHAPTER PAGE

REFERENCE NOTES . . . . . 115

BIBLIOGRAPHY . . . . . 117

APPENDIX A: LETTER TO MS PATIENTS . . . . . 125

APPENDIX B: INTERVIEW GUIDE . . . . . 128

# LIST OF TABLES


| TABLE | | PAGE |
|---|---|---|
| 1. | Modification of the Kurtzke Scale for Evaluating Disabilities in Multiple Sclerosis | 38 |
| 2. | An Arbitrary Classification of MMPI Items by Content | 61 |
| 3. | Basic Minnesota Multiphasic Personality Inventory Scales | 62 |
| 4. | Item Composition of the IPAT Anxiety Scale | 65 |
| 5. | Sex of MS Patients | 72 |
| 6. | Ages of MS Patients | 72 |
| 7. | Education of MS Patients | 73 |
| 8. | Marital Status of Patients | 73 |
| 9. | Number of Offspring of MS Patients | 74 |
| 10. | Employment Status of MS Patients | 74 |
| 11. | Ethnic Origin of MS Patients | 75 |
| 12. | Ordinal Position of MS Patients | 75 |
| 13. | Childhood Home Environment of MS Patients | 76 |
| 14. | Age of Onset of Disease of MS Patients (Initial Symptoms) | 76 |
| 15. | Initial Symptoms of Disease of MS Patients | 77 |
| 16. | Time Lapse Between First Symptoms and Medical Diagnosis of MS Patients | 78 |
| 17. | Number of Doctors Seen Prior to Diagnosis of MS Patients | 79 |
| 18. | Duration of Illness and Degree of Disability | 80 |
| 19. | Family History of MS Patients | 81 |
| 20. | Membership in MS Society of MS Patients | 81 |

TABLE PAGE

21. Distribution of Full Scale Intelligence Quotients for MS Patients on the WAIS . . . . . 83

22. Mean Scores, Variances, and Standard Deviations for MS Patients on the Wechsler Adult Intelligence Scale . . . . . 84

23. WAIS Verbal, Performance, and Full Scale IQs for MS Patients . . . . . 85

24. WAIS Verbal Scaled Scores for MS Patients . . . . . 87

25. WAIS Performance Scaled Scores for MS Patients . . . . . 88

26. Mean Scaled Scores for Two Previous MS Studies Compared to Present Study Using the WAIS . . . . . 94

27. Distribution of Anxiety Sten Scores for MS Patients on the IPAT . . . . . 96

28. Mean Scores, Variances, and Standard Deviations for MS Patients and IPAT Norming Sample . . . . . 97

29. IPAT, Self Analysis Form Raw Scores and Sten Scores of MS Patients . . . . . 98

30. Number of MS Patients with Scores Above 70 on the Minnesota Multiphasic Personality Inventory . . . . . 101

LIST OF FIGURES


| FIGURE | | PAGE |
|---|---|---|
| 1. | WAIS Mean Profile of Female MS Patients . . . . . | 90 |
| 2. | WAIS Mean Profile of Male MS Patients . . . . . | 91 |
| 3. | Total Group WAIS Mean Profile of MS Patients . . . . . | 92 |
| 4. | MMPI Mean Profiles of MS Patients . . . . . | 100 |

# CHAPTER I

## THESIS INTRODUCTION

### Introduction to the Problem

Augustus Frederick d'Esté, a bastard son of English nobility, initiated what was considered the earliest descriptive account of a disseminating disease known today as multiple sclerosis. At the age of 22, d'Esté recorded in his daily writings that he was victimized by a strange disease with the following symptoms: progressive weakness, numbness, difficulty in walking, painful spasms, and mental depression (Firth, 1948). In the month of December, 1822, d'Esté's diary entry indicated he attended a funeral and he continued by saying that he

> struggled violently not to weep, I was however unable to prevent myself from so doing:--Shortly after the funeral I was obliged to have my letters read to me, and their answers written for me, as my eyes were so attacked that when fixed upon minute objects indistinctness of vision was the consequence:--Until I attempted to read, or to cut my pen, I was not aware of my Eyes being in the least attacked. Soon after, I went to Ireland, and without any thing having been done to my Eyes, they completely recovered their strength and distinctness of vision. (Firth, 1948, p. 25)

The diary was later published in 1830 under the title, The Case of Augustus d'Esté (Firth, 1948). Considering later diary notations, McAlpine, Lumsden, and Acheson, the authors of the comprehensive book entitled Multiple Sclerosis A Reappraisal (1972) indicated there was no doubt that the diagnosis of the disease could be multiple sclerosis (MS).

Simultaneously in 1838, two contemporary researchers made the first references to sclerotic spinal cords. Sir Robert Carswell, the Scottish pathologist, illustrated his findings while Jean Cruveilheir, a physician living in France, described the hard spots that were discovered during an autopsy. In fact, Cruveilheir speculated that the hardened spots in the spinal cord were the cause of the disease: Today, it has been accepted that the spots or "Island of Sclerosis" (Greek terminology) are not the cause but the concrete pathological proof of the disease multiple sclerosis (MS). The earliest classified account of MS recorded by Jean Martin Charcot indicated "the symptomatic progression of a disease that moved from exacerbations to remissions to exacerbations, with severity that varied greatly from patient to patient" (Szumlas, Note 1, p. 4).*

Nature of the Problem

The medical mysteries of MS from the past have continued to plague investigators. Each individual with symptoms common to those attributed to the illness of MS has had to rely on extensive laboratory tests that in the end have not provided a conclusive diagnosis.

Developments in medical research have eliminated most threatening infectious diseases and partially controlled the problems related to common chronic illnesses. However, the last century has not seen the ultimate control, prevention, cause, or cure of MS. The struggle to find clues about the MS mystery has continued for modern man: The 1972 statistics estimated that 500,000 people in the United

---

*Reference notes are listed separately preceding the bibliography.

States may have had MS or a related disease (Braunel, James, & Stoval, Note 2).

Dr. Hader, President of the Prairie Division, Multiple Sclerosis Society of Canada, reported in his presentation, Current Developments in Multiple Sclerosis Research (Hader, Note 3) that 35,000 Canadians suffer from MS. Mrs. LaForge, Executive Director of the Prairie Division, Multiple Sclerosis Society of Canada, quoted Dr. Hader as saying: "A very reasonable safe guestimate of the prevalence of Multiple Sclerosis in Saskatchewan would be over one hundred per one hundred thousand population, or a total of over one thousand patients with this neurological disorder" (Hader, Note 4, p. 4). She suggested the prevalence of the disease for the province of Alberta would be similar to Saskatchewan's rate. Therefore, Mrs. LaForge considered it possible for six to eight hundred people in the city of Edmonton to have MS.

From the literature distributed by the Multiple Sclerosis Society of Canada, MS was classified as a progressive disease which has usually proceeded in a series of unpredictable attacks, each causing further disability. To be classified as a disabling disease, the symptoms of the illness must have affected the routine and the daily activities of an individual.

Although a disabled person, the MS patient has been first and foremost a human being. As such, he has deserved to be treated as a normal person as far as possible: His disability has not changed his fundamental biological and psychological needs. MS clearly has not only affected the individual as a whole, but it has also affected his

family as a unit. Furthermore, the effect upon the community in which he has lived has been clearly felt.

As an example, the helping personnel in the community have found it necessary to involve themselves with the disabled MS patients. The problems of chronicity that have been typically associated with the older population were now forced on the younger MS patient: MS has been an illness that has commonly affected the youthful generation. When Haber surveyed the entire disabled population in 1968 for the United States government, he focused on part of the problems for young, chronically ill patients. At the time of writing, he reported that the rate of disability from chronic illnesses in the older population (55-64 years) was in excess of three times the younger age group (18-44 years) and approximately one and a half times that of the middle age group (45-54 years). As a consequence, most established facilities in the community have served the needs of the older, chronically ill patient (Haber, Note 5).

The basic research information on MS--its medical and non-medical effects on an individual--has proceeded very slowly for many complex reasons. There have been indications from past research that disruptive influences caused by the physical changes of MS were frequently accompanied by personality changes.

Certain severe illnesses that have caused debilitating social-psychological disruptions (for example, heart diseases and cancer) have received public recognition and concern. Such has not been the case with the general public has not been familiar with the name multiple sclerosis or its symptoms. As MS has rarely been the cause

of death and the course of the illness has usually been slow, disabling, and completely individualistic, no patterns have emerged which are recognizable to the layman.

Background of the Study

A careful examination of the literature on MS has revealed a paucity of material dealing with the mental or emotional symptoms of the disease. Cottrell and Wilson (1926) began testing affective disorders and reported that a moderately high percentage (63%) of MS patients experienced euphoria. It was not until 1948 that psychological assessments including intelligence, and personality tests were officially added to the comprehensive over-all medical research program of the National Multiple Sclerosis Society (U.S.A.) (Harrower, Note 6).

Responding initially to the topic of mental deterioration for patients with MS, Harrower answered negatively to the question, should MS patients anticipate that their mental capacity will deteriorate? "It seems that what we call rote memory, particularly the capacity to remember numbers may be said to be somewhat impaired in the later stages of the disease" (Harrower, Note 6, p. 8). She further emphasized in her lengthy pamphlet, that

> a cross-section of patients examined with intelligence tests showed there were bright and less bright people amongst the MS group just as there are bright and less bright people who have other diseases or among those in the population at large who, at the time of examination, appear to be quite healthy. (p. 9)

However, she did recommend intelligence testing as an essential part of every clinical assessment.

Inherent in the problem of appraising the intelligence of MS

people has been the estimation of the capability level and the possible determination of any functional loss (Canter, 1951a). For MS patients, Capps (1939) indicated the need for thorough, descriptive accounts of the nature and extent of changes in mental functioning. He also pointed out the need for more accurate knowledge of mental functioning that remained unimpaired in spite of personality maladjustments or cerebral disorders.

McAlpine et al. (1972) have suggested that there is eventual mental deterioration with MS patients. However, according to these authors, intellectual deterioration has been rare in the early stages of the disease, except in acute cases where there was evidence of widespread cerebral involvement. Hunt and Cofer (1944), who have also maintained that people with MS should anticipate intellectual deterioration, have defined this deterioration as a "psychological deficit" (p. 971).

While faced with conflicting reports from researchers with regard to intellectual deficits, other psychologists have chosen to compare MS patients with groups of people who had cerebral damage from other disease sources. Goldstein and Shelly (1974) reported a difference of test results when they compared MS patients with neuropsychiatric patients and patients with various other forms of brain damage. In their attempt to replicate previous studies, Goldstein and Shelly did not support the research of Brown and Davis (1922) or of Cottrell and Wilson (1926) that cited little, if any intellectual impairment.

On examining specific studies, Davis (1973) indicated that the

worst periods of adjustment for various illnesses occurred at times when the symptoms were relatively slight or easily ignored. Assumptions that psychological distress and difficulties would increase proportionately as physical symptoms advanced with disabling intensity, were incorrect according to Harrower's research (1953). Anxiety has been classified as one form of psychological distress and Rollo May (1950) concurred with the opinion of Davis (1973) who discussed the topic of self identity. In Davis's terms, anxiety was the product of a threat to a person's self-existence values.

Up to this point, only one facet of the personality has been discussed. Research dealing with MS patients has indicated that a wide variation of individual differences existed in personality areas other than anxiety. Harrower (1953) stated that no typical personality pattern has emerged. Using the MMPI, Canter (1951b) gained support for the common observation of the presence of the "neurotic overlay" with MS patients. His research was conducted to determine if there was a distinct pattern of personality characteristics for MS patients.

In contrast to the previous study, Philippopoulous, Wittkower, and Cousineau (1958) did not confirm the findings from Canter's research. Philippopoulous and his colleagues were testing for common personality characteristics. No one particular dynamic constellation of personality traits was found among the MS group, nor was their reported hysterical makeup evident. This study appeared to be the only Canadian research dealing with emotional and personality factors of MS patients

A careful review of MS literature revealed that most

psychological research assessing MS patients has not been conducted in Canada. The 1974 epidemiological survey of MS by F. J. Szumlas has appeared to be the only Alberta product. After presenting some descriptive statistics, Szumlas discussed the emotional needs of the MS patient.

The lack of local information became more apparent when the reference literature used as a guide for lay and professional therapists consisted of a New York pamphlet written in 1953. Although Harrower's publication titled Mental Health and MS has not been the only information written for the patient with MS, it has extensively covered the psychological aspects of the disease.

There appeared to be a consensus of opinion between Szumlas (Note 1) and Harrower (Note 6) when they both emphasized the important role of a counselor or a psychologist to the MS patient. In fact, Szumlas established as his prime recommendation a counseling program to meet the needs of the MS group. If such a program was to be initiated, current individual information of the local MS population would be needed.

While previous work investigating some psychological factors of MS patients has been done, to date there has been no local attempt to assess these patients. Therefore, in the present study, the MS patient was psychologically assessed in an attempt to gain local, up-to-date information.

## Purpose of the Study

A review of recent MS literature has revealed a paucity of research dealing with the psychological aspects of the patient. Where

such investigations have been completed, the information has not been current, nor has a study been conducted using local people. In addition, there have been differing opinions expressed regarding the level of intelligence, anxiety, and lastly, whether a common personality profile existed for the MS patients.

"The M.S. patient needs someone to talk to, someone to communicate with and someone who understands" (Szumlas, Note 1, p. 25). The establishment of an emotional counseling program is of primary concern to the MS patient and the community in which he lives. Before such a program can be established, current data on local MS patients must be collected.

It was the purpose of this descriptive survey to determine the intellectual levels of a local sample of MS patients using the Wechsler Adult Intelligence Scale (WAIS), and to measure the level of free-floating, manifest anxiety by administering the IPAT Anxiety Scale Questionnaire (IPAT) to the same group. Further to the above mentioned tests, the Minnesota Multiphasic Personality Inventory (MMPI) was given to determine if a common or typical personality profile existed with these MS patients. These instruments were chosen by the present author because they are well-known, standardized psychometric techniques used in a wide variety of settings (e.g., clinics, hospitals, and social service agencies).

## Definition of Terms

The following operational definitions were used to facilitate the understanding of the terminology used in this and similar, previous research.

Anxiety. Cattell and Scheier (1961) defined anxiety as being different from fear but interchangeable with the word stress. They stated that

> anxiety is a single entity which has (a) a dynamic origin distinct in quality from primary drive, even from the very similar need for security (fear), but possibly derived from them; (b) a unique quality of introspected experience; and (c) a specific pattern of physiological expression (at least in anxiety neurosis and anxiety hysteria), though the resultant overt behavior may be endlessly protean. (Cattell & Scheier, 1961, p. 14)

In psychological theories, anxiety has frequently been poorly defined leading to inconsistency in understanding and using this term. Often anxiety has referred to the state of arousal which has been a conditioned response to stimuli in the environment.

For the purpose of the current study, the high anxious subject was considered one who scored at a high level on the IPAT Anxiety Scale Questionnaire. The low anxious subject was one who obtained a low score on the IPAT Anxiety Scale Questionnaire.

State-Anxiety. State-anxiety was defined as a psychological disposition which has been held in relative permanence.

Trait-Anxiety. Trait anxiety was defined as a momentary process variable which has been aroused by a particular situation.

Descriptive Survey. A descriptive survey has been defined as a study which had as its established aim the description of a given observation which was testable.

Exacerbation. Exacerbation has been defined as the reappearance of old symptoms or the increase in intensity of existing symptoms for a time period (long or short).

Intelligence (IQ). IQ has been defined as that which was

measured on the Wechsler Adult Intelligence Scale (WAIS); a measure of what the examinee has learned, or a measure of intelligent behavior. According to Wechsler's definition, "Intelligence, as a hypothetical construct, is the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment" (Matarazzo, 1972, p. 79).

Multiple Sclerosis. "Multiple sclerosis is a chronic disease characterized pathologically by the presence of numerous areas of demyelinization in the central nervous system and a wide variety of neurological symptoms and signs which have a tendency toward remission and exacerbation" (Merritt, 1967, p. 705).

Remission. Remission has been defined as the discontinuance of (a) symptom(s) in whole or in part for a time period.

Personality Characteristics. Personality characteristics have referred to the total range of behavioral expressions which may be predictive of what a person will do in a given situation. The term characteristics has been used synonymously with the term personality. The manner in which an individual has been conducting his life and the typical and habitual pattern of dealing with the world have also been used as elements in defining personality characteristics (Fann & Goshen, 1973, p. 58).

## Organization of the Study

The data required for the present study were obtainable only from MS patients. Information regarding the proposed study was sent to all members of the Edmonton Chapter, Multiple Sclerosis Society of Canada. This was accomplished by mailing a news bulletin containing

a letter from the author asking patients to volunteer for the project. The letter outlined the author's proposed research project and established the guidelines for the participants' eligibility.

Specific demographic information was collected from the volunteers during individual interviews. After an introductory session, a minimum of three separate meetings was required to collect the data.

## Thesis Overview

Following the thesis introduction in Chapter I, a brief report on the disease, its symptoms, and its unique character has been presented in Chapter II. A condensed review of the literature and the recent research follows in Chapter III, while Chapter IV contains a description of the study design, the instruments used, and the methods and procedures of data collection. The data gathered during the study have been reported in Chapter V. Finally, a summary of the results along with implications and recommendations for further study have been presented in Chapter VI.

# CHAPTER II

# MULTIPLE SCLEROSIS

## Introduction to the Disease

> Multiple Sclerosis is one of medicine's strangest mysteries, with an unknown cause, an unexplained geographic distribution, an unpredictable course, an undiscovered cure and its treatment, to say the least, is highly controversial. It is the commonest disease of the central nervous system affecting men and women in the prime of life in Northern Europe and North America. (Multiple Sclerosis Facts, Note 7)

The problem of understanding multiple sclerosis (MS) has centered around its unknown variables. In Chapter II a n overview, the author has briefly presented the conclusions of a century of research. Beginning with a historical review, the author continued by describing the epidemiological concepts. As the etiology aspects of MS have been closely associated with clinical and pathological identification, these facts were considered along with the layman's interpretations of the symptoms and diagnosis of MS. The chapter was concluded by a selective examination of the medical, social, and psychological problems that relate to multiple sclerosis.

## Historical Retrospect

The following history of MS was summarized fro he history outlined by Walter Timme (1950).

The functions of the spinal cord have fascinated medic l men from the earliest of time. Hippocrates suggested "a palsy to all parts of the body below the neck" (Timme, 1950, p. 3) followed the breakage of a blood vessel in the brain (apoplexy). From animal experimentation

of monkeys, Galen suggested the possibility of partial paralysis from apoplexy in the cerebral area or from injury to any special vertebra.

Medical understanding advanced so little between the 3rd and the 18th centuries that John Cooke, a medical lecturer in the 17th century, supported his lectures from the writings of Galen. He also used the new facts advocated by the French School at this time which divided the nervous system into two parts: the brain and the ganglia.

In 1837, Carswell differentiated a type of spinal paraplegia by sketching colored pons and medulla found indiscriminately throughout the spinal cord. The Frenchman, Cruveilhier added to these illustrations by describing a condition of "gray degeneration" which replaced the normal white cord tissue. He stated, "This new tissue is dense--much more so than the cord itself. I cannot compare this tissue with any other morbid tissue of which I have knowledge" (Timme, 1950, p. 4).

Ten years later, Frerichs diagnosed some clinical examples of spinal sclerosis and his pupil, Valentiner supported these clinical assumptions with autopsy and pathological reports. Frerich's clinical observations were characterized by a condition with exacerbations and remissions, one body side affected first and then the other, early paresis of the lower extremities, disturbance of motility over sensibility, frequent psychic episodes, and occurrence primarily among the young adult.

In 1856, Rokitansky described the new growth in the central nervous system (CNS) indicating the relationship of the brain and cord. However, it was Charcot who finally formalized the observations, the symptoms, and the pathology as they are known today. He noted three

symptoms which have been referred to as the Charcot Triad and have included: scanning speech (pauses emphasized after each syllable), intention tremor (violent shaking of the limbs especially when patient control is attempted), and nystagmus or ocular abnormalities (involuntary flicking of the eye in any direction).

Early theories claimed MS was caused by infectious disease, trauma, inflammation, and viruses, as compared to the claims of current theories that MS has been caused by viral infection or allergies.

## Ecology

Although MS has been studied for more than 130 years, the disease has continued to be a mystery. The data collected in the few areas that have provided empirical information (for example, clinical symptoms, pathological findings, and epidemiological data) are still confusing. The unique nature of the disease has contributed to distinct schools of thought. In an effort to provide a comprehensive framework for understanding the ecology of MS, a number of different kinds of information have been gathered.

Geography. Multiple sclerosis has appeared to be uncommon in the tropical and subtropical zones of the Northern and Southern Hemispheres. In contrast to this, in the temperate zones of Europe and North America there has been an increase in the prevalence rates. Millar (1971) has described the prevalence rate as the number of patients suffering from MS per 100,000 of the population. Acheson (Millar, 1971) has defined a high risk area as having a prevalence rate of 40 per 100,000 or greater and low risk areas as having a prevalence rate of 20 per 100,000 or less. The majority of the high

risk areas are between 40° and 65° north latitude in the Western Hemisphere, although there are cases of MS in other hemispheres.

Barlow (Millar, 1971) claimed the geomagnetic latitude was the important factor. Mutations of cell immunology and the resulting susceptibility of individuals to diseases were the suggested result of "cosmic-ray induced radioactivity."

The decrease of disease frequency nearer the equator in the Northern Hemisphere was not exactly the same in the Southern Hemisphere (Millar, 1971). The prevalence rate was higher between 40° North and the equator, than between 40° South and the equator (McAlpine, Lumsden, & Acheson, 1972).

Seasonal Influences. Zeigler suggested MS exacerbations occurred more frequently during spring and summer while Freeman indicated that warm climates prevented relapses (Limburg, 1950). The majority of the research surveyed did not reveal a consistent pattern of seasonal variation.

Racial Influences. Acheson (1961) expressed a possible link between genetic factors and predisposition to infection. Early studies reported a lack of selective association between MS and race. Millar (1971) supported the view that people of Northern European origin were affected with the disease more than other races; Negroes, Orientals, and Indians, as racial groups, were reported to have some evidence of MS but the prevalence rate was much lower. Alter and Kurtzke (1968) supported the view that the higher standard of living was directly related to the greater frequency of MS.

McAlpine et al. (1972) associated an environmental influence, not

the genetic factors, to the high and low world pattern of MS. Migration before or after a critical age (i.e., 15 years) has been studied extensively with no conclusive results having been reported. In summary, the relationship between genetic factors and the predisposition to MS is unclear.

Onset Age. The onset of MS has usually occurred when the patient is young. It was suggested in the literature that the ages 20 and 40 were the most frequent estimates, although MS cases as young as 11 and as old as 60 years of age have been reported (Currier, Martin, & Woosley, 1974).

Urban-Rural Differences. Limburg (1950) did not find statistical differences between the urban and rural areas from studies in Holland and Scotland. Swank, Lersted, Ström, and Backer in 1952 found MS to be higher in rate in rural (farming) than in urban (non-farming) communities. Beebe, Kurtzke, Kurland, Auth, and Nagler (1967) reported that male army veterans studied in 1967 showed that a greater risk (4 times higher) existed for those living in metropolitan centres than for those living in small towns. Hader (Note 4) implied from the Saskatchewan experience that more MS patients came from the country (were born or came from the rural areas).

To quote McAlpine et al. (1972) "The association of risk with urban living is less secure but the quality of the evidence in its favor is high if it is still small in quantity" (p. 41).

Sex. Leibowitz and Alter (1973) suggested a slight female preponderance with female to male ratios ranging from 1.08:1 to 1.13:1. A study in Winnipeg indicated an increase in the female to

male ratio but the ratio followed the same pattern. In 1951 the observed ratio was 1.4 to 1 and the 1960 resurvey ratio was greater, 1.6 to 1 female to male (Alter & Kurtzke, 1968). Szumlas (Note 1) studied 32 MS patients in Southern Alberta and the female subjects outnumbered the male subjects by a ratio of 2.6 to 1. McAlpine et al. (1972) concluded that women were not only clinically diagnosed at an earlier age but were attacked by the disease more frequently than men. Using data from 10 surveys, the grouped ratio was 1.9:1.

Etiology

Numerous theories have been advanced regarding the cause of MS and the manner in which the disease is produced. General agreement has existed that multiple factors affect its cause. Common to current researchers was the rejection of theories relating to stigmatization or typical deficiences of body types or organ inferiority. Currently, two theories have occupied the strategic positions in the growing body of research. Environmental and genetic factors have played a key role in both theories (Davis, 1973).

According to one of the most popular theories, the cause of MS has laid in a viral infection. The virus may enter the body, remain dormant for a period of time, and then produce an illness. The concept of a slow or latent virus is different from most of the infectious diseases. This slow virus when activated (activation may be due to trauma or infection), attacks the central nervous system, generating the process of demyelinization. Support for this theory was found in the results of laboratory tests where high levels of anti-measles antibodies in the blood and cerebral spinal fluid were found (Lee, Note 8).

The Immunological, or Allergic Theory, was found to be one of the most popular research topics. It was hypothesized that multiple sclerosis may be an autoimmune disease called into action to fight off foreign substances. In other words, MS may be an allergic response, which causes the body's own immunizing agents to attack the fibres of the central nervous system. By producing antibodies against some of its own tissues, the normal protective immune defenses are misled. Again blood samples were tested in the laboratory for unusual antibodies. "The protein which contains most of the antibodies, is increased in the spinal fluid in a significant percentage of multiple sclerosis patients" (Lee, Note 8, p. 4). If antibodies did exist, the researcher suggested that a vaccine was possible for the prevention of MS.

Margolin's concept of physiological regression in psychosomatic disorders was applied to MS in 1954. He claimed myelinization of the CNS occurred in the first years of life and all natural elements (vitamins, minerals, etc.) had to be supplied to avoid the predisposition of the nervous system to later structural disorders. This theory incorporated the hereditary, developmental, and environmental factors (Rudd & Margolin, 1964).

McAlpine et al. (1972) reviewed MS for the effects of infection and trauma prior to the onset of the disease. He noted both factors seemed to occur more commonly before the disease onset than would be expected by chance. Conditions commonly associated with traumatic experiences included: prolonged sickness, pregnancy, monetary problems, and the imposition of additional responsibilities.

Clinical and Pathological Descriptions

Multiple sclerosis is a chronic, neurological disease. Demyelinization in the area of the brain and spinal cord, central nervous system (CNS), prevents the passage of signals to and from the brain. The neurological symptoms exist in a variety of forms but MS is typically characterized by remissions and exacerbations of the disease (Merritt, 1967).

Most of the body functions that relate to one's daily activities are controlled by impulses transmitted along nerves in the brain and the spinal cord. These impulses travel to and from the brain, through the spinal cord, to other parts of the body return (Multiple Sclerosis Facts, Note 7).

The white matter of the CNS is composed of nerve fibers that are insulated or coated with a fatty substance termed myelin. MS attacks the myelin and the sheath is destroyed by disintegration. Scar tissue (patches of sclerotic tissue), or hard plaques that form, lead to the eventual nerve fiber degeneration. Repeated nerve fiber damage or demyelinization caused from larger, thicker, and more plaque formation eventually leads to permanent destruction of the nerve fibers. The result of this destruction is the prevention of passage of signals to and from the brain. In other words, the transmission line used to facilitate the passage of motor and sensory impulses is interrupted. This interference slows, and eventually blocks the nerve impulses completely (Davis, 1973; Multiple Sclerosis Prairie News, Note 9).

Drs. R. Bunge and M. Bunge, in 1961, studied the relationship

of the Schwann cells in the peripheral nervous system and the oligodendrocytes in the CNS. They concluded that the Schwann cells and the oligodendrocytes play a major role in demyelinization and the eventual course of the disease (Merritt, 1970).

Clinical symptoms vary greatly, and MS has become known as an individual disease because it affects each person in a different manner. This variation is caused by differing locations of the lesion sites. There are three main lesion sites in the CNS: the spinal cord, the brain stem (cerebellar), and the cerebrum (Davis, 1973).

Spinal cord lesions produce symptoms such as the absence of sensations, numbness, insensitivity to touch or pain, and lack of position. Effects may be felt in the leg area by a sense of heaviness, weakness or awkwardness, and the gait may be unsteady or stumbling. If the hand is influenced, difficulty may be experienced in fine movement control or in the handling and carrying of objects. Paralysis in the limbs may eventually develop and strangely disappear. Dysfunctioning of the bladder and/or the bowel in the form of retention or incontinence may occur (Davis, 1973).

Cerebellar or brain stem lesions manifest themselves through visual problems such as diplopa (double or blurred vision) or nystagmus (involuntary movement of the eyeballs). Chewing and swallowing may prove to be difficult and slurred speech may occur. There may also be an absence of the gag reflex. Again, vacillation in the appearance and disappearance of the symptoms may result (Davis, 1973).

The last lesion area is in the cerebrum and its effects are recognized as the disease advances. Disagreement in the medical field

exists over the symptom evaluation. As orientation, thinking, and behavior are affected by cerebrum lesions, it is difficult to assess whether the symptoms are due to the stress of the disease or the area of demyelinization (Davis, 1973).

McAlpine et al. (1972) described, after extensive research, a benign form of MS. The onset of this form of MS was usually mild and recurrences unimpressive; thus medical attention was not sought. Discovery of the pathological lesions occurred only during an autopsy.

Symptoms, Signs, and Diagnosis

The diagnosis of the disease has been very difficult. For years there has been no specific, conclusive laboratory test for MS because of the inconsistent characteristics of the disease. For example, a common test, cerebrospinal fluid examination (CSF), assisted in the MS diagnosis but other pathological diseases provided similar results in the fluid changes (Davis, 1973).

Multiple sclerosis, hypothesized as multicausal in origin, has usually been diagnosed from combined historical and neurological findings. If evidence of fluctuation or steady progress of the disease existed and symptoms of CNS lesions were manifested, a probable diagnosis of MS may have been made.

Although neither conclusive nor complete, steps have recently been made in diagnosing MS. Carp, a virologist, reported the discovery of a transmissible factor that had the appearance of a virus (Hader, Note 3). This discovery was confirmed by the research of Drs. Henle in 1975, which propogated a viral agent. Even the researchers cautioned that the results were "not yet conclusive" (Dampier, 1976).

Dr. Levy 1976 reported using the MAL test (measles-adherent lymphocyte), a blood test which was claimed to identify the MS disease. An added feature of this test was the claim that identification in the early stages of the disease was possible (Edmonton Chapter, Note 10).

In MS, the tools are still lacking for definite diagnosis as well as prognosis of the disease. There is no method of predicting the future or the disease course for the patient. Measures of severity in MS are established indirectly through the degree of the neurological disability. Classifying and clarifying past information does not help in preparing the patient to live with MS, or in predicting the course of the illness.

The disease has been known to cripple, but not to kill. Knowledge of the life history of the disease is a prerequisite to the establishment of any effective therapeutic measures. The mysteries of the disease far outweigh the known facts; therefore, the confusion that the MS patient experiences after diagnosis, is predictable. This lack of knowledge about the disease may lead to an extreme range of reactions (for example, non-threatening to great fright, panic to utter disbelief).

Additional problems may result from symptom manifestations. They may range from swift, severe onset to vague, erratic, insidious appearance. The patient's credibility may be questioned when these unclear, facillating features are reported. The Multiple Sclerosis Society of Canada listed a number of symptoms that should not be ignored:

1. Periods of reduced or exaggerated symptoms alternating

2. Partial or complete paralysis of parts of the body
3. Numbness in parts of the body
4. Double or otherwise defective vision, such as involuntary movement of eyeballs
5. Noticeable dragging of one or both feet
6. Severe bladder or bowel trouble (loss of control)
7. Speech difficulties, such as slurring
8. Staggering or loss of balance (MS patients erroneously are thought to be intoxicated)
9. Extreme weakness or fatigue
10. Pricking sensation in parts of the body
11. Loss of coordination
12. Tremors of hands (Multiple Sclerosis Facts, Note 7, p. 2).

A variety of factors play relevant roles in the precipitation of disease exacerbations, which cause relapse or continuous decline of the patient. Patients are cautioned against the effects of fatigue, overexertion, overwork, accidents, injuries, childbirth, and infections.

Medical, Social, and Psychological Effects

The medical, social, and psychological conditions have had profound effects on the MS patient. The unknown cause, undiscovered cure or treatment, and the individualistic symptoms of the disease have led to the predictable confusion experienced by each patient. Medical problems have been inherent in the disease. In view of the ambiguous, and vacillating nature of the symptoms, combined with the unpredictable course of the disease, further research (both medical and nonmedical) has been required.

The disease, which usually strikes the younger age group, has

forced alterations or abandonment of the patient's goals and living style. Important aspects such as career and family require re-evaluation. These disruptions in turn have created problems relating to the patient's self-image and identity. Patients have been prematurely forced to concentrate on maintenance of body functions and general health. Many have been classified as handicapped and thus required to cope with possible prolonged bed-care, social derogation, and prejudicial attitudes.

Disruptions of family roles have had important effects because the MS individual has had others to consider. Traditional family roles may have to be re-evaluated (for example, mother who has been a homemaker may be forced to become a breadwinner; due to the fact that MS is more common among near relatives than among the general population, the young married couple may change plans to have children). In addition, the physical plan of the home may require alterations to allow for maximum mobility.

Disturbances in sexual relations have been common in the course of this disease. Gross sexual maladjustments such as impotency, decrease in sexual interests, abstinence in men, and coldness, frigidity, abstinence, and dyspareunia in women, have frequently occurred.

The relationships that an individual has shared with family and friends may decline. Lack of shared experiences, isolation, and poor sexual relations, have been common complaints from MS patients. There has been little doubt that physical changes in the body have frequently been accompanied by personality and psychological changes (Braunel,

James, & Stoval, Note 2).

Treatment

Research projects involved with the prevention of MS have had limited results. Just as distant from success has been the development of an effective treatment program for the patient with this disease.

Therapeutic programs have been established to provide only comfort and adjustment for the MS patient, because the course of the disease has not appeared to be influenced by treatment. Reports of success have been considered with skepticism. Unfortunately, when a patient following a treatment program has had a remission, it has been difficult to assess the value of the treatment. Whether the remission (a natural occurrence in MS) was spontaneous or the result of the therapy, can only be determined by repetition and replication. The prevention of attacks would be the ultimate experimental break-through that scientists require.

Drug Therapy. Drug therapy has controlled the disease symptoms to a limited extent. Spasticity (reflex spasms) has been reduced and body dysfunctions (bladder and/or bowel control) relieved. Amelioration of visual disturbances has occurred and emotional distresses (depression and apprehension) diminished. This nonpermanent relief has been administered in oral or injection form. The following briefly outlines the role of drugs with MS:

1. Dantrolene Sodium—benefits experienced in only 60-70% of patients
   —tone of muscle spasms decrease as muscles relax
   —clonis decreased (Hader, Note 3)

2. Ditropan—relief of symptoms of bladder spasms
   —possible adverse reactions (Hader, Note 3)

3. Mega Vitamins—use of 19 different drugs
   —some side effects and patient reactions
   (Hader, Note 3)

4. Cortisone—reduced severity and shorter duration of MS attacks
   —long term use may have undesirable side effects
   (MS prairie News, Note 9)

5. ACTH—reduced severity and shorter duration of MS attacks
   —long term use may have undesirable side effects
   (McAlpine et al., 1972; MS Prairie News, Note 9)

6. Phenol—relief of spasticity
   —injection (McAlpine et al., 1972)

7. Diazepam—antispasmodic drug (McAlpine et al., 1972).

Rehabilitative Therapy. Active patient participation is required during physiotherapy. Following an attack, the patient is left with residual motor disabilities. Later if there is a plateau period, special exercises counteract spasticity. The muscles in the unaffected areas are also maintained by exercises. However exercise can be detrimental during acute phases of the disease (Redford, Note 11).

Orthotic devices, such as braces and assistive equipment like canes or crutches are also used to maintain the mobility of the patient (Redford, Note 11).

Electrical Stimulation. It has been suggested that electrical stimulation of the spinal cord be used to regain the voluntary muscle control over the arms, legs, and sphincters. This technique has been recognized as having limited value but, like any demyelinating disease, the therapy did improve the ability to regulate muscle movement for a select group of patients (Hader, Note 3). On the other hand, Redford

(Note 11) stated that electrical stimulation had no place in the MS treatment program.

Dietary Therapy. The diet of MS patients was carefully considered by Miller (cited in Hader, Note 12). He stated that sunflower seed oil, rich in linoleic acid, seemed to reduce the number and severity of MS attacks.

Acupuncture. Although acupuncture has been used with MS patients, this technique has been considered to be in the experimental stages. Seland suggested that more research was necessary to report the effectiveness of acupuncture as a treatment for MS (MS Prairie News, Note 9).

Surgical Controls. Cutting the tendons of spastic muscles has improved patient comfort. Tenotomy to prevent severe crossing of the legs has helped relieve contractures. Recently surgical transplants have been considered as a form of relief (McAlpine et al., 1972).

## Summary

Attempts to explain the mysteries of MS have produced few consistent results. Symptoms have varied greatly, providing ambiguity and uncertainty for everyone involved with the disease. Treatment programs have been aimed primarily at providing comfort for the patient and assisting with the problems of adjusting to the disease. Understanding of the life history of the disease is required before effective therapeutic measures can be established.

# CHAPTER III

## REVIEW OF THE RELATED LITERATURE

### Introduction

Psychological assessment of individual traits and abilities has been improved from its traditional role of mere categorization, to the more recent use of individual test results in attempting to understand the composite personality.

As stated in Chapter I, the National Multiple Sclerosis Society (U.S.A.) incorporated psychological testing into its research program in 1948 (Harrower, Note 6). Numerous studies were sanctioned and financially supported by the Society. These studies endeavored to investigate intelligence, intellectual impairment or deficit, personality characteristics, and factors of affect as they relate to MS. A survey of the literature revealed that some of the psychological tests administered to different groups of MS patients included: the Army General Classification Test (AGCT), the Wechsler-Bellevue Intelligence Scale (W-B), the Babcock Scales, the Shipley-Institute of Living Scale for Measuring Intellectual Impairment, the Hunt-Minnesota Test for Organic Brain Damage (HM), the Minnesota Multiphasic Personality Inventory (MMPI), the Rorschach Technique, the Szondi test, Man-Woman Drawings, the Most Unpleasant Concept test, Halstead's Tests for measurement of biological intelligence, the Bender Visual Motor Gestalt test, Figure-Drawing, Halstead's Neuropsychological Test Battery, the Trail Making Test, and the Wechsler Adult Intelligence

Scale (WAIS). On the basis of this survey, the present author concluded that further research of the literature would add to the already long list.

Choice of Test Instruments

In choosing the test instruments for the present study, consideration was given to such aspects as test validity, test reliability, range of abilities and personality characteristics of patients, and factors affecting administration of the tests. To the patients, the measurements used needed to appear appropriate and logical. This was accomplished by using instruments which were interesting, not too lengthy, and generally understandable. Needless to say, the above points were extremely important in choosing suitable tests for examining people with MS. The test instruments lent themselves to some degree of adaptability for the MS patients. Individual administration was chosen, in order to facilitate rapport and, in addition, observe the test behavior of each individual.

In this study, the present author selected the Wechsler Adult Intelligence Scale (WAIS), the Minnesota Multiphasic Personality Inventory (MMPI), and the IPAT Self Analysis Form (IPAT) because they met the criteria listed above. Each of the tests selected was a well-known, standardized psychometric instrument (see Chapter IV). Together as a test battery, they sampled a wide range of abilities and personality characteristics. These measurements were designed for use with adults in hospitals, clinics, schools, and research and have come to play an authoritative role in a variety of settings.

Because the present research was a descriptive study of MS

using the WAIS, the MMPI, and the IPAT, it was beyond the scope of this study to review the literature in detail. The literature regarding various concepts and theories of the dynamics of personality structure and intellect would also be too extensive to mention. The vast amount of research on any one test precluded an investigation of its total aspects. In summary, the literature reported in this chapter pertained directly to the identified sample and the relationship to the three psychological tests listed above.

Intellectual Assessment of MS Patients

Historically, the functional relationship of the brain to intelligence has been traced as far back as Aristotle's laws of learning. Crafts, Schneirla, Robinson, and Gilbert (1938) maintained that assumptions of man's learning ability resulting from changes in the brain's nervous tissues, were considered long before experimentation was contemplated. Significant information regarding the structural and physiological characteristics of the brain was formulated by the 19th century. Sugar and Nadell (1943, p. 267) claimed that "a paucity of material dealing with its MS mental symptoms" existed in American literature; most research in 1943 related to the somatic and pathologic symptoms, but the mental characteristics of the disease were ignored.

When the mental manifestations of MS were considered, the literature indicated a vast diversity of opinions resulting from observational studies. For example, Charcot and Dupré "referred to progressive dementias characterized by defects of memory, hallucinations and other markedly expansive moods closely resembling general

paresis" (Sugar & Nadell, 1943, p. 267). On the other hand, only slight mental changes, which were transitory in nature, were reported by Hunt and Kraepelin (Sugar & Nadell, 1943). Cottrell and Wilson (1926) found negligible intellectual defects (2% of the sample) in 100 consecutive MS patients in a clinical setting, but these defects were accompanied by marked emotional changes. In contrast, in 1929 Ombredane noted that 36 out of 50 MS patients had very clear intellectual losses; however, his study was not based on quantitative comparisons. "He believed that the main loss was represented by difficulty in initiating mental effort toward the solution of problems and in the fatigability of mental functions, although he also observed losses in memory, association of ideas, and abstraction" (Ross & Reitan, 1955, p. 663).

In addition, Hunt and Cofer in 1944 defined the concept of psychological deficit as "a loss or impairment of intellectual efficiency from a previously high level" (Canter, 1951a, p. 3-4). Using the Rorschach test in 1945, Burgemeister and Tallman (cited in Canter, 1951a) conducted one of the first purely psychological studies on MS patients. Confirming Burgemeister's findings, Canter reported "that there appears to be an intellectual constriction and impoverishment which is out of keeping with the educational and cultural background of the patients" (Canter, 1951a, p. 10).

An important study by Harrower (1950), using a test battery which included the Wechsler-Bellevue, focused on 61 MS patients and 457 control cases (200 emotionally disturbed, 187 normals, and 70 handicapped patients). To make use of the best comparative data,

Harrower discarded the results from subjects with lower intelligence scores (over 25 cases). She thought it unlikely that these scores would obscure the results. Intellectual testing data were not presented in her interim report to the Association for Research in Nervous and Mental Diseases. In fact, the final research report was not submitted until 1951, at which time, using all subtests of the Wechsler-Bellevue, she stated:

> Summarizing these findings, we may say that as the disease progresses a greater amount of scatter among the subtest scores, i.e., a less well integrated intellectual performance, appears. In the same way, there is a decrease in the percentage of the multiple sclerosis group which falls within the very superior and superior ratings as the disease advances. From a breakdown of the findings for all subgroups of multiple sclerosis patients, it appears that memory is the most vulnerable trait examined in the subtests (p. 48).

Between the time that Harrower presented her interim report and the time that the final results were released, two other research projects involved with MS patients were published. Diers and Brown (1950) completed a study of 24 MS patients using the Wechsler-Bellevue scales. Data from this psychometric evaluation indicated that the IQ distribution in the MS group was essentially normal. Statistical analysis revealed that the MS group showed significant departure from normal performance by a low memory span for digits (forward and backward) and better than average visual concentration and attention in the Picture Completion subtest. In addition, Diers and Brown attempted, unsuccessfully, to use Wechsler's scales to determine a mental deterioration index in MS. The Wechsler-Bellevue Scale was not adequate as a single indicator of existing cortical damage with MS patients.

In a study involving 47 MS patients, who were war veterans and a control group of 38 normals, who were hospital staff, Canter (1951a) compared indirect (Wechsler-Bellevue Intelligence Scales and the American Army General Classification Test) and direct (Babcock, Shipley-Hartford, Wechsler Deterioration Index and Hunt-Minnesota Scales) measures of intellectual deterioration. The results of the American Army General Classification Test and/or the Wechsler-Bellevue Scales given at the time of induction into the Armed Forces in the U.S.A. provided objective and quantitative estimates of original capacity and level of intellectual functioning of the patients prior to the onset of the disease. Presumably none of the veterans were afflicted by the disease prior to induction, for a diagnosis of MS would have warranted rejection by the Armed Forces. Repetition of one or both of these tests provided an estimate of the present level of intellectual functioning. A comparison of the difference between the scores (before and after) represented a direct estimation the level of mental functioning. Because determining the degree of mental deterioration was the purpose of the indirect measures used by Canter, each test was administered once to each patient after the MS was diagnosed. Canter hypothesized that the results of the indirect measures would relate significantly "to direct measures of deficit based on tests before and after impairment" (Canter, 1951a, p. 13), which would indicate that the degree of deterioration could be determined by indirect measures. Mental deterioration was evident from the results of 23 MS subjects and the correlation between the direct measures and the indirect measures was significantly positive

($p < .05$). The analysis of the MS data indicated a general loss of motor speed in the performance tests; therefore, the deterioration for MS patients appeared to be in general as well as specific areas.

Problems associated with unmatched, control studies in this area were specifically handled in Baldwin's 1952 research. Matching for socio-economic status, occupation, age, education, and marital status, she compared the intellectual functioning of 34 female MS patients and 34 controls, consisting of women not under the care of a doctor. More severe degrees of deterioration occurred in the 65% of the MS sample who showed more chronic and incapacitating stages of the disease, thus supporting the relationship between physical involvement and mental decline (Baldwin, 1952). However, the validity of these results may be questioned because the Hunt-Minnesota Test has been shown to misclassify a large proportion of patients with and without intellectual impairment. Therefore, the main testing instrument could have been the reason for finding intellectual loss in certain patients with MS but no loss in many others.

Since negative and positive results relating to intellectual impairment had appeared in the literature, Ross and Reitan (1955) employed a different procedure to study three samples (MS, organic brain damage, and no history of brain damage) for chracteristic mental changes with 13 MS patients. Using the MMPI, Halstead's tests for measurement of biological intelligence, and the Rorschach, they concluded that the MS sample, even those without obvious signs of mental deterioration, had a high percentage of intellectual impairment (mean was 55% below non-brain damaged sample). Support for Ross and

Reitan's conclusions was found in 1956 by Sai-Halasz in a study of 200 MS patients without a control group (McAlpine, Lumsden, & Acheson, 1972).

Consistent with Baldwin's 1952 study, Parsons, Stewart, and Arenberg (1957) concurred that intellectual deterioration may or may not occur in MS patients. Investigating the abstracting ability of 17 MS patients and a matched control group having no central nervous system disorder, the authors reported a significant difference between the test scores of the two groups. The W-B and the Grassi Block Substitution Test were administered and the results indicated that the MS patients manifested a loss in the ability to function at the abstract level. It was postulated that a parallel existed between the degrees of abstracting disability and the extent of neurological disturbances.

In contrast to the previous study, different results were obtained in a Canadian research project where 40 patients (22 males and 18 females) with MS and 40 volunteer control subjects (17 nurses and 23 patients) were compared on a battery of tests which included a measure of intelligence for only 15 subjects from the sample. The investigators, Philippopoulous, Wittkower, and Cousineau (1958) concluded that a significant difference between the two groups was not evident when W-B results were compared. Comparison of the two groups in terms of Verbal, Performance, and Full Scale IQ's, as well as individual subtest scores did not elicit a significant difference, although the MS patients showed a tendency to have lower scores on Comprehension, Digit Span, Picture Arrangement, and Object Assembly.

Investigating the link between intelligence and physical changes in MS, Fink and Houser (1966) reported a significant inverse correlation between Verbal IQ scores as measured by the WAIS and the degree of physical involvement. Between 1961 and 1966, these investigators examined 50 nonhospitalized persons who had had MS for no more than five years when first tested. A modification of Kurtzke's (1955) scale for evaluating disability in MS was utilized to divide the nonhospitalized persons into eight categories. (See Table 1.) To quote the authors,

> The significant relationship found between verbal I.Q. and physical disability is most interesting, in view of the fact that the two measures bear no logical relationship. Physical disability does not enter into the verbal sub-tests, which seems to rule out the possibility of any cause-effect relationship. What seems more likely is that lowered I.Q. and increased disability are both consequences of the underlying disease. In other words, it may be hypothesized on the basis of the present data that multiple sclerosis has the effect of lowering both physical and intellectual abilities. The r l test of this hypothesis would have to come from a longitudinal study of change (p. 60).

As in investigations by Parsons, Stewart, and Arenberg (1957) and Ross and Reitan (1955), findings of a 1968 psychiatric study in England comparing 108 MS patients with a control group affected by muscular dystrophy supported the idea of intellectual deterioration (McAlpine et al., 1972). The results suggested that approximately two-thirds of the MS sample experienced deterioration by loss of memory, conceptual thought, attention, and concentration. The deterioration ranged from mild memory loss to profound global dementia.

The most recent literature on the topic of intelligence suggested a relationship between the extent and location of lesions in the CNS and the degree of psychometric impairment. In particular,

TABLE 1

MODIFICATION OF THE KURTZKE SCALE FOR EVALUATING DISABILITIES IN MULTIPLE SCLEROSIS

1. No symptoms related to multiple sclerosis.
2. Slight weakness, or stiffness or mild trouble in walking, or awkwardness, or mild trouble with eyes.
3. Weakness of an arm or leg, or staggering when walking, or lack of feeling in a leg or arm or some other part of the body, or difficulty in controlling urine, or interference with vision or double vision.
4. An arm or leg paralyzed but can walk unaided or with only one cane.
5. Needs two canes, crutches, walker or braces to walk.
6. Restricted to wheelchair but able to enter chair and wheel self alone.
7. Restricted to bed but can use arms effectively.
8. Restricted to bed and cannot use arms.

Source: Kurtzke, 1955.

Matthews, Cleeland, and Hopper (1970) used a controlled study to provide intergroup comparisons from a battery of cognitive, moto sensory, and personality measures. Because MS and other neurological diseases may have some similarities, 30 MS patien were matched with a control group of patients with neurological diseases other than MS. They were tested on nonverbal concept formation ability, rhythm and speech discrimination, and on the verbal and performance sections of the WAIS. In tests demanding motor speed, steadiness, and fine coordination, the MS group performed significantly lower. All the other tasks showed similar levels of achievement between the MS and the control group.

One of the biggest problems encountered in resolving the issue of intellectual functioning and/or impairment was brought forward by Reitan, Reed, and Dyken (1971) who studied 30 MS subjects and a matched control group with normal brain functions. On an extensive test battery including pure motor function, motor functions with a problem-solving component, problem-solving tasks that required a motor response, and measures in other categories not limited by motor functions, they reported the MS group did poorly on all motor-performance tasks. Mild impairment was evident in experimental group subjects in the areas of verbal information, verbal communication, abstract reasoning, and logical analysis. They concluded that:

> The extensive battery of tests used in the present investigation may provide findings which are sufficient to resolve much of the conflict that has centered around the question of intellectual and cognitive impairment in MS since the various areas of relative intactness and relative impairment have been specified. (Reitan, Reed, & Dyken, 1971, p. 224)

A study by Goldstein and Shelly (1974) provided interesting results through its attempts of "replicating two previous studies done in the area of behavioral aspects of MS" (p. 280). Although differences existed using the W-B Scales between the results of the study by Reitan et al. (1971) and the Matthew's et al. (1970) study that utilized the WAIS, both investigations used the Halstead Battery of Neuropsychological Tests and found similar test results. Goldstein and Shelly used Wechsler's report of the high correlations between the matched subtests on the WAIS and the W-B to substantiate their research conclusions from their 1974 study. Goldstein and Shelly (1974) selected three groups: 20 MS patients, 20 brain-damaged patients, and 20 patients with psychiatric problems. The presence of cognitive deficits in MS patients was verified and consistent with the conclusions reached by Reitan et al. (1971). Although the group of MS patients in Matthews' et al. (1970) study performed at a lower level on the subtests than the groups used by Reitan et al. or Goldstein and Shelly, the mean Verbal IQ was higher than the mean Performance IQ in all three studies. Duplicated results for the MS groups from the three studies included Digit Symbol as the lowest scale score, and above average verbal scale scores (excluding Digit Span). The results of the three studies led to a common conclusion: While the level of general intelligence varied, the pattern of high and low subtests, and the significant motor disfunction was essentially the same.

In summary, during the past three decades, knowledge of the effects of MS on intelligence has been difficult to obtain and confusing. The introduction of standard psychometric instruments as

measurement tools and the use of experimental controls as compared to observational techniques appeared to lend more credibility to the results. The literature on the significance of cognitive change has conflicted. Research varied in reports and interpretations of intellectual impairment, but there appeared to be a consensus of opinion as to a relationship between intelligence and the disease variables (Matthews et al., 1970; Fink & Houser, 1966; Parsons et al., 1954; Baldwin, 1952).

## Personality Characteristics of MS Patients

In providing their opinions on the physical, emotional, or affective symptoms, and changes the disease had on MS patients, Cottrell and Wilson (1926) stated:

> In scanning the literature we have often been disappointed with the way in which so significant a group of symptoms has been treated, one of the obvious reasons for which is, that the disease [MS] comes almost entirely under the purview of the neurologist. (p. 1)

Collaboration between the neurologist and the psychiatrist was expressed as the only effective manner of dealing with "abnormal emotionality that is characteristic of disseminated sclerosis" (p. 1). Having observed and verbally questioned 100 MS patients, they concluded that a change in emotional reaction was universal.

The emotional reaction was explained by Sugar and Nadell (1943) as the instability of affective behavior. They quoted Charcot in 1879 as having written, "It is not rare to see them [MS pat- ] give way to foolish laughter for no cause, and sometimes to melt into tears without reason" (p. 274). Then in 1905, Seiffer "was the first to use the te 'polysclerotic dementia' in describing a psychotic state

occurring in multiple sclerosis, characterized by a morbidly expansive mood, euphoria, or a marked lability and sudden change of mood" (p. 268). Reporting from more than 10 different studies, Sugar and Nadell summarized the affective or mental changes of MS patients as viewed from past research.

Up to this point, the personality make-up of multiple sclerotics was viewed as being changeable as a reaction to the physical symptoms. The effect of the disease on the individual, when researched, led to the divergence of opinion regarding changes in personality. In 1922, Brown and Davis suggested that apart from the mood changes, the patient retained the same basic personality. Braceland and Giffin (1950) felt the stage at which the disease manifested itself was the affecting factor of personality change. The earliest MS research frequently used the terms premorbid personality, hysteria, and euphoria to describe the MS patient (Borberg & Zahle, 1946; Cottrell & Wilson, 1926; Jelliffe, 1921; Lansworthy, Kolb, & Androp, 1941; Sugar & Nadell, 1943). Investigating the psychiatric aspects of 100 patients using a controlled study, Pratt (1951) was one of the first researchers to report that a specific premorbid personality type could not be defined. In his work using the Thematic Apperception Test, he did not find hysteria and euphoria to be prominent features. Pratt's findings were more in line with those of Braceland and Giffin and in contrast to those of Cottrell and Wilson (1926) who reported a moderately high level (63%) of MS patients experiencing euphoria. These different findings were probably due primarily to differences in the character of the material studied. For example, Cottrell and Wilson

studied neurological aspects.

During the same year in which Pratt released results of his study, Harrower and Kraus (1951) continued to support the idea of a premorbid personality structure among MS patients. They argued that the patient's premorbid disposition and the progression of the disease forced certain typical conditions on the patient. Using a number of projective measurements, 140 MS patients were tested with the results being indicative of "no typical stereotyped or uniform personality picture. [However] . . . in every test used there were some items which differentiated this experimental group from the controls" (p. 44). The incidence of certain trends in the MS group was significantly higher than in the control group: MS patients showed an absence of physical concern; overemphasis of dependency needs; low inner conflict; or an attitude of resignation, and unrealistic optimism. Marked deviation from the general population pattern was evident with individual MS cases.

Psychological aspects of MS as measured by the MMPI were reported by Canter (1951b). His descriptive study attempted to reveal any reliable personality characteristics of MS patients. Thirty-three war veterans from a previous research project conducted by Canter received a retest six months after the initial MMPI assessment. Statistical analysis did not show a significant difference between the mean profiles. The findings revealed an elevation of the three scales (Hypochondriasis, Depression, and Hysteria) which form the neurotic triad, supporting the presence of a "neurotic overlay" in MS. The views of Grinker, Ham, and Robbins (1950), who purported that

"neurotic manifestations often obscure the first evidence of the central lesions, causing many false diagnoses of hysteria" (Canter, 1951b, p. 255) were supported when Canter noted that 65% of the MS veterans had been classified as having hysteria before the disease was diagnosed.

It was interesting to note that while the mood and emotional direction of Canter's group was toward depression, this predominance of dysphoria was contrary to the findings of Sugar and Nadell (1943) which indicated that the MS patients were euphoric. To support his views, Canter presented the personality characteristics as being: reactions of depression, preoccupation and concern for bodily functions, hopelessness, insecurity, indecisiveness, and introversion.

Baldwin's study of 1952 further supported the presence of the neurotic triad (Hypochondriasis, Depression, and Hysteria) in MS patients. Marked schizoid trends were shown to be more prevalent in her study than in previous investigations. In addition, Ross and Reitan (1955) indicated all three of their groups (brain damaged, non-brain damaged, and MS) were high on the scales of the neurotic triad.

There appeared to be further support for Canter's MMPI profiles when Shontz (1955) published his results. Using 16 patients who were hospitalized for MS and a hospitalized control group with other chronic illnesses, Shontz reported elevated scores on the Hs, D, and Hy scales even though the actual scores were lower than those found by Canter. Reasons given for the lower scores included the higher mean age, the longer duration of the illness, and adaptation to the disease process of the patients in the present sample.

In comparing the personality patterns of MS patients and patients with other neurological diseases, Matthews, Cleeland, and Hopper (1970) employed a different method of profile analysis. Using the four group classifications of (a) normal, depressed, (b) normal, non-depressed, (c) abnormal, depressed, and (d) abnormal, non-depressed, developed by Gilberstadt and Farkas (1961), these investigators found equal profile frequency for the two groups in the depressed area. The MS group was higher in frequency than the control group in the abnormal profile classifications.

The most recent MMPI testing of MS patients was conducted by Schwartz and Brown in 1973. Rated for disability by using the Kurtzke system (see Table 1), 70 MS patients and 61 patients classified as having a pseudoneurological disorder were tested on "two MMPI indices--the 17-item pseudoneurological scale (PsN) and the 7-item complex of Hovey" (Schwartz & Brown, 1973, p. 471). The PsN items differentiated the MS patients from those with pseudoneurologic disorders but the 7 Hovey items did not discriminate between the groups. When the cut-off score of the PsN scale was adjusted, the scale correctly identified 87% of the MS group and 90% of the other group.

In summary, research findings on the personality of the MS patients conflict. Earliest researchers used the terms premorbid personality, hysteria, and euphoria to describe the personality of the MS person. Recent research indicated that while trends have emerged, no one personality type has been found to be typical. Studies have been found to support the conclusion that MS patients are euphoric, while others have been found to support the conclusion that

MS patients are depressed. Elevation of the neurotic triad (Hs, D, and Hy) has frequently been found in studies using the MMPI. Some research has indicated that emotional changes in the patients were universal, while other research has indicated that patients experienced mood changes, but the basic personality remained constant.

Measurement of personality characteristics from intrinsic self-disclosure appeared to be as vulnerable as observational deductions from others. To illustrate this final point

> an extract from the diary of Barbellion (1948), a sufferer of the disease: 'I am astonished at the false impression these entries give of myself. The picture is incomplete anyhow. It represents the cloud of forebodings over my inner self, but does not show the outward front I present to others. This is one of almost constant gaiety--unforced and quite natural.' (Pratt, 1951, p. 327)

Anxiety of MS Patients

Throughout the literature related to MS, the same basic problems connected with traditional research on anxiety were evident. As numerous psychological theories of anxiety exist, an exact or precise understanding of the term was difficult to obt . This confusion was compounded during early research when some authors interchanged and used synonymously the term "anxiety" with other words, like "stress" and "fear." Whatever theoretical approach was employed to understand this personality characteristic, anxiety was expressed as a measurable factor that varied from one individual to another. The uniqueness of anxiety was also considered by the manner in which each person suffered and coped with this unpleasant state. To understand this state of unpleasantness, Mowrer concluded:

> There is a common tendency in our day, both on the part of

> the professional psychologists and laymen, to look upon anxiety as a negative, destructive, "abnormal" experience, one which must be fought and if possible annihilated.
>
> . . . Anxiety . . . is not the cause of personal disorganization; rather it is the outcome or expression of such a state. The element of disorganization enters with the act of dissociation or repression, and anxiety represents not only an attempted return of the repressed but also a striving on the part of the total personality toward a re-establishment of unity, harmony, oneness, and "health." (May, 1950, p. 109)

While indicating the difficulties of assessing emotional factors and their effects on the MS patients, McAlpine et al. (1972) concluded that the relevant examples from the first edition of their book emphasized the ubiquity of the disease and most importantly, they established the need for future research. Reporting on emotional stress, McAlpine et al. presented examples from d'Esté (1822) and Charcot (1872) that might relate to anxiety as it is known today. Using an account of one patient who experienced a series of physical traumas prior to the onset of MS, McAlpine et al. mentioned the relationship between emotional shock and the disease onset. Likewise, previous researchers, such as Moxon in 1875, Russell in 1911, and Bramwell in 1917, noted this phenomenon (McAlpine et al., 1972).

S. E. Jelliffe (1921, 1922) presented two different reports on his studies of MS. By carefully studying his patients' unconscious life for any important emotional factors, Jelliffe believed that he could uncover the source of increased tensions. These tension states were the cause of the changes in the nervous regulators. He stated: "Whereas external methods of measuring the force of emotional factors have been going on for a number of years, study of internal means of registration are only just beginning" (1922, p. 87). The general

conclusion of his observational research was that emotional factors produced somatic alterations because the unconscious emotional factors, under more tension than the conscious factors, functioned continuously. Jelliffe evidently reported that certain localized somatic changes, dependent on one's unconscious emotional state, would produce the MS plaques that interrupted the nerve pathways. One can only speculate whether the tensions referred to by Jelliffe were related to the anxiety covered in the present paper.

Cottrell and Wilson (1926, p. 8) briefly alluded to "mental uneasiness, anxiety, tension, or dispeace" as being the opposite of euphoria. Later, Sugar and Nadell (1943) made reference to Ombredane's (1929) opinions in their literary review of the mental indicators of MS. Ombredane stressed anxiety as the main symptom of new MS patients who were later classified as psychotic.

Of direct relevance to the present investigation was Harrower's report (1950) that an MS group had common characteristics such as exaggerated submission, compliance, and absence of inner tension during all stages of the disease. She suggested that MS patients tested with the Rorschach Test reflected low anxiety and concern over their bodily functions. A normal group tested at the same time was shown to have three times the number of responses of the MS group.

Grinker, Ham, and Robbins compared 26 patients and found no free-floating anxiety but rather "an easy-going, happy-go-lucky attitude" (1950, p. 457). At the same meeting that Harrower (1950) and Grinker et al. (1950) presented their reports, Braceland and Griffin (1950) reviewed their work with 200 patients, and they

concluded that most patients reacted with a normal degree of anxiety and concern consistent with their disability.

At a later date, Harrower and Krause (1951) expanded the first author's initial investigation and obtained similar results. After examining extensive records, these researchers postulated that anatomical answers on the Rorschach Test were related to an individual's conscious or unconscious concern and anxiety over various bodily functions. The experimental group showed a decrease in the number of anatomical answers, while the MS patients in remission had a similar number of answers as the normal group.

> One might say that the best type of adaptation to a disease situation for which there is no solution is actually to disregard its presence. Patients during a period of remission, on the other hand, who are coming back within the normal framework, may permit themselves some concern with the body. (Harrower et al., 1951, p. 51)

After carefully considering the wide range of anxiety estimates from Ombredane to Harrower, a study involving 100 MS patients and 100 control subjects was summarized by Pratt (1951). The MS group did not differ significantly from the control group when anxiety or hysteria was considered. When Ross and Reitan (1955) reported the presence of neurotic-like, affective disturbances with MS groups, they suggested anxiety, depression, hysteria, and body concerns were characteristic of these affective disturbances. Rather than producing a typical personality profile for MS patients, the authors concluded that their evidence emphasized only the differences in group trends.

Using the Rorschach Test, Philippopoulos, Wittkower, and Cousineau (1958) found their group of 40 MS patients to express less anxiety than the 40 members of the control group. When test protocols

were examined, the anxiety indicated by the MS group generally related to body preoccupations.

The last direct reference linking MS and anxiety came from the study by Fink and Houser (1966). These investigators noted low scores on the Digit Span subtest of the WAIS. This subtest has shown to be sensitive to behavior characteristic of organic brain damage, memory defect, or anxiety. Diers and Brown inferred the same results from their study in 1950.

[redacted], a review of the literature relating anxiety to MS also ind[redacted]icting trends. Early investigators postulated a relat[redacted]een emotional shock and the onset of MS. Some researchers have concluded that anxiety was one of the causes of MS, while others considered anxiety as a symptom of MS. Studies were found which indicated anxiety was not associated with MS; others were found which indicated an amount of anxiety consistent with the disability; and still others indicated increased anxiety with remission of the disease.

# CHAPTER IV

## DESIGN AND PROCEDURES

In an attempt to update local information regarding psychological characteristics of multiple sclerosis patients in Alberta, lengthy discussions were conducted with Mrs. LaForge, the Executive Director of the Prairie Division, Multiple Sclerosis Society of Canada. The subsequent understandings gained from these professional discourses aided in establishing logical, constructive tasks to be required of the MS patients during the present research. The author attempted to maintain for the MS patient a low level of projected frustration in all aspects of the research without jeopardizing test standardization. The following is a brief review of the design and procedures of the present study.

### Population and Sample

All members of the Edmonton Chapter, Multiple Sclerosis Society of Canada were defined as the research population. Contact was made through the monthly newsletter distributed by the Chapter; a total of 795 copies were mailed. Although this number appeared small in total, it must be remembered that the projected incidence of MS for Alberta was just over 100 per 100,000 population (Hader, Note 4).

Target Sample. In delineating a target sample Matthews et al. (1970) have outlined as a criterion that the patients needed to be able to complete an extensive battery of psychological tests. In some instances the MS disease had progressed to the point where

psychological testing was impractical. For example, the disease may have caused some physical incapacitation which prevented the administration of the performance section of the WAIS and thus the Full Scale Intellectual Quotient could not be determined. Pratt (1951) found that MS patients in the relatively early stages of the disease were able to complete an extensive battery of tests. Pratt also found that the duration of the acute symptoms ranged from 1 to 8 years with an approximate average of 4 years. The selection rule of not including patients with the most acute stages was reinforced by Fink and Houser (1966) when they found some patients with physical disabilities severe enough that the motor tasks in the psychological tests could not be completed. Fink and Houser did not include patients who had the disease for more than five years when the patients were first tested.

The above factors were considered in determining the criteria for selection of the subjects for the present study. In addition, because the instruments chosen were designed for use with adults, an age criterion was established.

The target sample for this study was delineated by the following four criteria:

1. willingness to participate and resident in Edmonton;
2. diagnosed as having multiple sclerosis by a medical doctor;
3. MS diagnosis made within the last five years; and
4. subject eighteen years of age or older.

Considering the possibility of a research casualty rate (volunteers

who for some reason discontinue to participate), the author requested a minimum of 25 adults.

The request for volunteers for the proposed research was acknowledged by a total of 28 individuals. During telephone conversations with these subjects, the four criteria, the goals, and the expectations were carefully outlined. Eight of the initial volunteers were deleted at this point as they did not meet the established sample guidelines. Therefore, the research sample consisted of 20 adults with multiple sclerosis. After the first interview, the sample was decreased to 14 due to misinterpretation of the criteria (for example, some MS patients thought the term "the five years" was related to the time when medical advice was given to quit working), and the obvious difficulty an individual might encounter doing the research tasks. The difficulty which could initiate high levels of frustration was due mainly to the patients' physical states.

Study Sample. The study sample consisted of the 14 volunteers who lived in Edmonton and had the disease MS, diagnosed by a medical doctor within the last five years.

## Procedure for Data Collection

The initial step in the research required the arranging of individual interviews during which demographic data, such as sex, age, education, and medical information (see Appendix B), were obtained. The Wechsler Adult Intelligence Scale (WAIS), a measure of intelligence, was administered individually to the 14 volunteers. The Minnesota Multiphasic Personality Inventory (MMPI) and the IPAT Anxiety Scale Questionnaire (Self Analysis Form) were administered at

later dates. Care was taken to consider the patient's health when requesting completion of these tasks, as many MS patients tire very quickly, suffer from severe headaches and blurred vision, if they exert themselves too much.

All test administrations and data collections were handled by the author at a time convenient to the volunteers. All but three individuals requested home appointments. The three psychological tests were presented in the standard manner, following the directions provided in the manuals. The initial scoring was done by the author to maintain consistency in the scoring procedures. To check for incorrect marking, all test score sheets, profiles, and interpretations of the results, were reviewed by a different psycholog (certified in Alberta) for each individual test.

To complete the tes ng, the time variance was: the WAIS--55 minutes to 2 hours, 10 minutes; the MMPI--45 minutes to 3 hours; and the IPAT--5 minutes to 20 minutes. At no time did the volunteers meet as a group, thus anonymity was maintained. During the last appointment, the author assured each participant that an individual follow-up session would be arranged to present individual profiles, plus the general research findings. This last step was seen as a necessity in view of the keen interest of each individual in MS research.

## Test Instruments

In view of the vast amount of information available on each of the test instruments, this review was not intended to be exhaustive, but rather to provide an overview of information pertinent to

the use of these tests in research.

The Wechsler Adult Intelligence Scale

The Wechsler Adult Intelligence Scale (WAIS), published in 1955, is an extension and revision of the Wechsler-Bellevue Scales. Composed of 11 subtests, which are scored individually, the WAIS provides three different intelligence quotients (IQ). The Full Scale Intelligence Quotient (FSIQ), expressed as a range of scores around the given score, is obtained by combining the Verbal and Performance sections to obtain the most consistent approximation of the test score. Less reliable than the FSIQ are the Verbal Intelligence Quotient (VIQ), which is determined from the first six subtests, and the Performance IQ (PIQ), which combines the last five subtests. The items chosen for use on the test were selected from tests already in use at the time Wechsler was developing the WAIS.

Considered among the best of the individual adult intelligence tests, the WAIS was standardized on 1,700 subjects, both sexes, aged 16-64. In addition, geographical location, urban vs. rural residence, race, occupation, and educational level were considered in selecting the subjects, in an attempt to have the sample representative of the entire population of the United States. Sampling was not done at random, and as a result, an unknown amount of bias may have been introduced (Wechsler, 1958, p. 11).

The order of administration of the tests in the WAIS and a brief description of the main concepts that are tested are as follows:

Verbal Tests

Information: general knowledge, memory, education

Comprehension: practical knowledge, social judgment, logical solutions

Arithmetic: concentration, enumerating, sequencing, arithmetic reasoning

Similarities: relationship and abstract thinking, association of abstract ideas

Digit attention, rote and immediate memory, sequencing, concentration

Vocabulary: word knowledge, verbal fluency, expressive vocabulary

Performance Tests

Digit Symbol: speed and accuracy of learning meaningless symbols, motor control, visual memory

Picture Completion: visual memory and alertness to details

Block Design: reproduction of abstract designs from patterns, visual perception

Picture Arrangement: interpretation of social situations, visual perception

Object Assembly: reproduction of familiar forms from memory, visual retention (WAIS Test Profile).

Consistent with the practice followed in most intelligence tests, the WAIS IQ is obtained by transferring the examinees' raw scores to scaled scores (mean of 10, standard deviation of 3), by using an IQ conversion table appropriate for each individual chronological age. Each conversion table of the WAIS covers an interval of two or more years. With adult subjects, the WAIS was designed to

yield a deviation IQ by setting the average sum of the scaled scores on the Verbal, Performance, or Full Scales equal to an IQ of 100 for each age group and a standard deviation of 15 IQ points. The standard deviation of the mean difference between Verbal and Performance for the normal population is 10.02. A discrepancy of 15 points between the two IQ's is considered diagnostically significant. Twenty points of discrepancy is interpreted as likely due to some type of malfunction (Wechsler, 1958, p. 160).

Reliability and validity studies were described in the WAIS Manual (Wechsler, 1955), Measurement and Appraisal of Adult Intelligence (Wechsler, 1958), and Wechsler's Measurement and Appraisal of Adult Intelligence (Matarazzo, 1972). Reliability coefficients for the Wechsler-Bellevue and the WAIS Full Scale IQs ranged from .90 to .97 and, for the performance and verbal sections, from .84 to .96. Using the Spearman-Brown Formula, split-half reliabilities ranged from .64 (Picture Arrangement) to .90 (Full Scale). The reliability data reported from the standard error of measurement and test-retest method consistently indicated the range of reliability to be exceptionally good for individual measurements (Wechsler, 1955 & 1958). Test-retest reliability data on the WAIS and its 11 subtests vary. For example, a 13-year study of 48 individuals reported correlations ranging from .73 Full, .70 Verbal and .57 Performance (Kangas and Bradway, 1971), while Coons and Peacock (1959) tested 24 mental hospital patients and found test-retest reliabilities of .96 or higher for all three WAIS IQ scores (Matarazzo, 1972, p. 241).

Validation of most psychological tests has been inadequately

conceptualized. There are four categories into which validity studies are divided: predictive validity (studying the criterion obtained some time after the test is given), concurrent validity (test score and criterion score are determined at the same time or when one test is proposed as a substitute for another), content validity (test items are a sample of the investigator's universe by deduction) and construct validity (measuring some attribute or quality which is not operationally defined and does not call for a new scientific approach) (Cronbach & Meehl, 1955).

The author of the WAIS attempted to meet all the crude criteria of validity, but the method of construct validity best indicated the adequacy of the instrument. Underwood (1957) stated that any test which has adequate reliability and validity may be considered as an operational definition of the trait it purports to measure. Accordingly, the WAIS satisfies the independent criteria of the general ratings from educators, reflects or conforms to the normal growth curves of mental ability, and lastly, compares with over-all socio-economic achievement (Wechsler, 1958, p. 108).

WAIS Assessment Trends for MS Patients. Many MS patients have experienced difficulty in completing the performance section of the WAIS (Fink & Houser, 1966), and it has been found that the ones who were able to complete these subtests experienced a loss of speed on motor tasks (Canter, 1951a, Harrower & Kraus, 1951). Several investigators (Diers & Brown, 1950; Fink & Houser, 1966; Harrower & Kraus, 1951; McAlpine et al., 1972; Philippopoulos et al., 1958; Ross & Reitan, 1955) have found that MS patients performed poorly on the

Digit Span subtest indicating possible auditory memory losses associated with the disease. Some evidence was found to indicate that performance on the Similarities subtest tended to be similar to that of brain damaged patients (Fink & Houser, 1966). Despite these trends of low Digit Span and low Similarities scores, the Verbal IQ, the Performance IQ, and the Full Scale IQ have not been found to be useful in making a differential diagnosis of MS (Fink & Houser, 1966; Goldstein & Shelly, 1974; Matthews, Cleeland, & Hopper, 1970).

Minnesota Multiphasic Personality Inventory

In the early 1940's, the Minnesota Multiphasic Personality Inventory (MMPI), a new psychometric tool to assess personality, was initially used in psychiatric practice but its application has become diversified to new fields that use personality inventories. Constructed by S. Hathaway and J. C. McKinley, the MMPI provides an objective assessment of some major personality characteristics that affect personal, emotional, and social adjustment. Despite extensive research, validation is still not complete or satisfactory. Gilbert stated:

> The MMPI is the only personality inventory which is still used extensively in clinics and mental hospitals, primarily because the multitude of others (inventories) have proven virtually useless in tapping any very meaningful dimensions in human behavior which are not more rewardingly revealed by other devices. (1969, p. 8)

Despite the aforementioned attribute, a need has been recognized to improve methods of applying the results of personality tests.

The MMPI was selected as a test instrument for this study since it had already been used in research with multiple sclerosis patients (Baldwin, 1952; Canter, 1951; Ross & Reitan, 1955; Schwartz &

Brown, 1973; Shontz, 1955). However, the most important reasons for using the MMPI were the diagnostic comprehensiveness and clinical background of this instrument. The test provides a totally objective score, is suitable as a controlled method of observation, and initially requires a minimum of the examiner's time as it is self-administered and easily scored. The disadvantages of the test include inexplicable profiles of scores, transparent intent evident by the content that is used, and therefore "the trustworthiness of the factual content of these self-descriptions varies extensively over the different content areas of the test" (Dahlstrom, Welsh, & Dahlstrom, 1972, p. 6).

The inventory consists of 550 statements covering a wide range of subject matter: feelings, symptoms, and behavior (see Table 2). The subject is asked to sort the statements into True, False, and Cannot Say categories as they apply to him at the present time. Good and Brantner stated:

> the fundamental assumption underlying use of the test is that persons who are similar in certain aspects of their behavior, that is, in their responses to a set of statements about themselves . . . are also likely to be similar in other ways and that therefore certain dimensions of the personality of an individual will be suggested by the pattern of his answers when it is compared with that of an identified group. (1961, p. 4)

The items, when scored, yield a profile consisting of four validity scales and nine clinical scales (see Table 3). Three validity scales (L, F, and K) provide measures of test-taking attitude along with trait inferences, and the fourth (the ? scale) reflects the number of items classified as "Cannot Say." The clinical scales were developed through answer comparisons between

TABLE 2

AN ARBITRARY CLASSIFICATION OF MMPI ITEMS BY CONTENT

| Category | Content Area | Number of Items |
|---|---|---|
| 1 | General health | 9 |
| 2 | General neurologic symptoms | 19 |
| 3 | Cranial nerves | 11 |
| 4 | Motility and coordination | 6 |
| 5 | Sensibility | 5 |
| 6 | Vasomotor, trophic, speech, secretory problems | 10 |
| 7 | Cardiorespiratory system | 5 |
| 8 | Gastrointestinal system | 11 |
| 9 | Genitourinary system | 5 |
| 10 | Habits | 19 |
| 11 | Family and marital relations | 26 |
| 12 | Occupational problems | 18 |
| 13 | Educational problems | 12 |
| 14 | Sexual attitudes | 16 |
| 15 | Religious attitudes | 19 |
| 16 | Political attitudes - law and order | 46 |
| 17 | Social attitudes | 72 |
| 18 | Affect, depressive | 32 |
| 19 | Affect, manic | 24 |
| 20 | Obsessive and compulsive stages | 15 |
| 21 | Delusions, hallucinations, illusions, ideas of reference | 31 |
| 22 | Phobias | 29 |
| 23 | Sadistic, masochistic trends | 7 |
| 24 | Morale | 33 |
| 25 | Items primarily related to masculinity-femininity | 55 |
| 26 | Items to indicate whether the individual is trying to place himself in an improbably acceptable light | 15 |

Source: Hathaway and Meehl (1951).

TABLE 3

BASIC MINNESOTA MULTIPHASIC PERSONALITY INVENTORY SCALES

| Scale Name | Abbreviation | Code Number | No. of Items |
|---|---|---|---|
| | Validity Scales | | |
| Cannot say score | ? | | |
| Lie | L | | 15 |
| Infrequency | F | | 64 |
| Correction | K | | 30 |
| | Clinical Scales | | |
| Hypochondriasis | HS | 1 | 33 |
| Depression | D | 2 | 60 |
| Conversion hysteria | Hy | | 60 |
| Psychopathic deviate | Pd | | 50 |
| Masculinity-femininity | Mf | 5 | 60 |
| Paranoia | Pa | 6 | 40 |
| Psychasthenia | Pt | 7 | 48 |
| Schizophrenia | Sc | 8 | 78 |
| Hypomania | Ma | 9 | 46 |
| Social introversion | Si | 0 | 0 |

Source: Hathaway and Meehl (1951).

diagnosed psychiatric groups and a large group of normals. Profile interpretation is not made on the evaluation of a single score, but profiles that deviate significantly from the average on two or more scales are important. For example, the "neurotic triad," interpreted from the Hypochondriasis, Depression, and Hysteria scales, is typically high for neurotics.

The values for the validated, diagnostic scales are converted to T scores, which have a mean of 50 and a standard deviation of 10 for the general population. After the subject's responses are counted for each scale, profiled on a type of graph, or coded (labeling the scores in order from highest to lowest beyond the normal limits of T score 70), a tentative hypothesis is predicted for the personality characteristics of the individual.

Reports on the reliability of the MMPI appeared satisfactory. The test authors (Hathaway & McKinley, 1967) indicated test-retest coefficients for six scales ranged from .83 to .57. Cottle (1950) tested unselected normals with two different test forms and the correlations for the clinical scales were .56 and .91. Finally, Holzberg and Alessi (1949), in the MMPI Manual, reported a reliability range of .59 to .88 on the clinical scales for test-retest using different test versions (p. 8). Validity estimated in more than 60% of new psychiatric [illegible]issions was reported by the authors to be positive (Hathaway & McKinley, 1967, p. 8) but the degree of statistical validity may be questioned as to its significance for different individuals in changing conditions. In general, the MMPI has proven to be a useful screening device for detecting affective personality

disturbances.

A summary of the personality trends of MS patients, as interpreted from the MMPI, has been outlined in Chapter III.

IPAT Anxiety Scale Questionnaire (ASQ)

The IPAT Anxiety Scale Questionnaire (Self Analysis Form), "is primarily designed to measure free-floating, manifest anxiety level, whether it be situationally-determined or relatively independent of the immediate situation" (Cattell & Scheier, 1963, p. 13). It was constructed by Cattell and Scheier in 1957 to meet the demand for a clinical instrument to measure anxiety. Classified as a brief, nonstressful test that yields an objective score, the ASQ (or the IPAT, as it is commonly titled), was derived from 4,000 to 5,000 questionnaire items categorized into 16 major personality traits through factor analysis. Five of the 16 personality factors conform to psychiatric symptoms suggestive of anxiety by statistically clustering together. Studies involving more than 3,000 persons confirmed the clustering effect of factor analysis (Cattell & Scheier, 1963).

Supplementing the clinical diagnosis or the appraised level of free anxiety, the test (see Table 4) appeared to be in consensus with psychiatric ratings of the anxiety levels determined through interviews. The 40 question IPAT yields three distinct numerical measures, the first of which consists of five separate components classified as "second-order anxiety factors" (Cattell & Scheier, 1963, p. 7) and labeled as:

1. Lack of Self-Sentiment, $Q_3$ (-);

TABLE 4

ITEM COMPOSITION OF THE IPAT ANXIETY SCALE

| Scale abbrev-iations | The Five Factors which Group Together as Anxiety Components | Weights (Number of Items) | Identification of Items by Number on Test Form | |
|---|---|---|---|---|
| $Q_3(-)$ | Defective Integration, Lack of Self Sentiment | 8 | 1, 2, 3, 4 | 21, 22, 23, 24 |
| C(-) | Ego Weakness, Lack of Ego Strength | 6 | 5, 6, 7 | 25, 26, 27 |
| L | Suspiciousness or Paranoid Insecurity | 4 | 8, 9 | 28, 29 |
| O | Guilt Proneness | 12 | 10, 11, 12, 13, 14, 15 | 30, 31, 32, 33, 34, 35 |
| $Q_4$ | Frustrative Tension or Id Pressure | 10 | 16, 17, 18, 19, 20 | 36, 37, 38, 39, 40 |
| | | | A | B |
| | | | COVERT ANXIETY Hidden | OVERT ANXIETY Symptomatic |

Cattell and Scheier (1963)

2. Ego Weakness, C (-);

3. Suspiciousness, L;

4. Guilt Proneness, O; and

5. Frustrative Tension or Id Pressure.

Cattell and Scheier (1963) reported that the questionnaire also divided the 40 items into two subscales:

A Score which gives a measure of covert, unconscious, hidden, or indirect anxiety (the first 20 items of the test); and

B Score which purports overt, symptomatic, or conscious anxiety (the last 20 items of the test).

Finally, the total score on all the items is the most important and dependable score, thus it is the indication of the anxiety level. Inferences based on the other score breakdowns are weak due to the brevity of the test.

The IPAT is conveniently designed to be self-administered, nonstressful, and simple to key score. The raw scores are converted to a sten scale (standard ten) consisting of equal-interval units, numbering from one to ten and one-half a standard deviation in width. Consistent with the assumptions of a normal distribution, the mean is 5.5 on the sten scale. The standardization tables are utilized to determine an individual's position in relation to a defined population (Cattell & Scheier, 1963, p. 10). Considerable literature involving psychological, physiological, and behavioral measures, and their correlation with the IPAT measures of anxiety was reported by Cattell and Scheier (1963). Comparing psychiatric clinical consensus and the IPAT scores, correlations ranging from +.3 to +.4 existed and Cattell

considered this range more than adequate when reviewing the low inter-clinician reliability. The statistical comparison of test scores between 795 normals and 59 anxiety hysterics clearly distinguished between normals (sten level 5.5) and high anxiety cases (sten level 8.1). In total score, the high anxious were 20 full points higher (raw score of 45) than the normals.

Total scale score reliabilities ranged from .80 to .92 for a one-week test-retest, while test-retest dependability for two years had a reliability coefficient range of .47 to .71. Further research indicated that split-half reliability coefficients (homogeneity) ranged from .60 to .63 for the covert subscale and .75 to .79 for the items on the overt subscale. Although brevity was the cause of the lower reliabilities reported for the IPAT items when compared to the first-order factors of the 16 Personality Factor Questionnaire (from which the IPAT items were taken), the authors indicated the dependability remained adequate for research purposes (Cattell & Schgier, 1963).

This study utilized the IPAT instrument to determine the overall picture of anxiety for the sample of MS patients. Clinical norms for the test have been established for the physically disabled group with locomotion interference. The questionnaire was designed to measure only free-floating, manifest anxiety. Twenty clinical groups, after completing the comprehensive 16 PF Test, indicated that the components classified as anxiety were

> the only ones which are typically high in all clinical groups . . . . anxiety as measured by the IPAT ANXIETY SCALE is much more highly and consistently associated with all forms of disorder (neurosis, psychosis, character .

> disorder, even physical disability) than are any other factors. (Cattell & Scheier, 1963, p. 14)

Demographic Data

The collection of demographic data was a major focus of this study. Data were obtained from personal interviews with the subjects and categorized as follows:

1. Personal data: sex, age, education, marital status, number of offspring, employment status
2. Background data: ethnic origin, ordinal position, home environment
3. MS Medical data. age of onset, initial symptoms, period between first symptoms and medical diagnosis, number of doctors seen prior to diagnosis, duration of the disease, family history of MS, membership in the MS society.

Research Questions

Previous investigations of MS patients and the relationship to specific psychological assessments have not been consistent, conclusive, current, or local. The present study was designed to be exploratory and conjectural in nature and to provide a description of the characteristics of local MS patients; therefore, no specific hypotheses were formulated. Inasmuch as the past research (Chapter III) has been conflicting and has not indicated a clear direction of the results that could be anticipated in this study, expected trends were not outlined. The following research questions were considered to be relevant to a study in this area:

Question 1. Are there discernible trends on the Full Scale

IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

Question 2. Are there discernible trends on the Verbal IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

Question 3. Are there discernible trends on the Performance IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

Question 4. Are there discernible trends on individual WAIS subtests obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

Question 5. Are the WAIS profiles of this MS sample consistent or inconsistent with profiles obtained from other research studies reviewed in Chapter III?

Question 6. Are there discernible trends on the sten scores obtained for this MS sample that are different from the IPAT general population norming sample on the IPAT Anxiety Scale Questionnaire?

Analysis of the MMPI profiles was "concerned primarily with the identification of the personality patterns associated with multiple sclerosis" (Canter, 1951b, p. 253). In this research, the MMPI profile of the MS sample was studied specifically to answer the following:

Question 7. What are the mean scores on each scale of the MMPI for females, males, and the total MS sample? Do common personality trends exist?

Question 8. How many MS patients scored below the T score of 30 or above the T score of 70 on each MMPI scale?

## Analysis of Data

Demographic data were classified by use of the simple descriptive statistics of frequency tabulations and means. Descriptive tables were prepared and presented for each category and research question. Data from the WAIS, MMPI, and IPAT profiles were graphically presented showing scale means and frequency tabulations. These graphs were studied to determine if deviation from the established means of the norming samples existed. Because of the small sample size, statistical analysis was not considered to be appropriate and only obvious trends were discussed.

## Limitations of the Study

1. The present study was subject to the limitations of volunteer research (Rosenthal and Rosnow, 1975).

2. The procedure for selection of subjects did not allow for the sample to be representative of all MS patients.

## Summary

In summary, the sample for this study consisted of 14 volunteers who lived in Edmonton and had the disease MS, diagnosed by a medical doctor within the past five years. In addition to collecting data through the administration of the WAIS, the MMPI, and the IPAT, the author collected demographic data from the patients. The reliability and validity of the test instruments were established and research using these instruments with MS patients was outlined. Research questions, analysis of the data, and limitations of the study were presented.

# CHAPTER V

# RESULTS

## Introduction

The information obtained during personal interviews (interview guide, Appendix B) has been compiled in this chapter. The demographic data collected have been divided into three categories: personal data, background data, and MS medical data. Research questions were formulated to compare the MS sample to the norming samples of the WAIS and the IPAT, and MMPI profiles were graphically compiled to determine whether common personality trends existed among MS patients.

## Demographic Data

Information gathered from personal interviews with the MS patients has been displayed in Tables 5 to 20. Almost three-quarters of the patients who volunteered to participate in the study were females. More than one-half of the sample fell within the age ranges of 20-40 years; however, 13 of the 14 subjects had indications of the disease prior to the age of 40. Even though the study had been limited to patients who had been diagnosed in the last few years, 10 of the sample of 14 had indications of the illness prior to this time span. The time span between initial symptoms and diagnosis ranged from 6 months to 30 years. The majority of the patients (10) had seen three or more doctors before diagnosis had been made. It was interesting to note that females reported a proportionately higher number of initial symptoms than did males. Early indications of the

TABLE 5

SEX OF MS PATIENTS

| Sex | Number |
|---|---|
| Females | 10 |
| Males | 4 |
| Total | 14 |

TABLE 6

AGES OF MS PATIENTS

| Age | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| 20-29 | 2 | 1 | 3 |
| 30-39 | 4 | 1 | 5 |
| 40-49 | 3 | 2 | 5 |
| 50-59 | - | - | - |
| 60-69 | 1 | - | 1 |
| Total | 10 | 4 | 14 |
| Mean Age | 38 | 38 | 38 |
| Age Range | 23-63 | 23-48 | 23-63 |

TABLE 7

EDUCATION OF MS PATIENTS

| Education | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Less than 8th grade | - | - | - |
| 8th to 11th grade | 4 | 2 | 6 |
| Completed high school | 4 | 1 | 5 |
| High school plus some course(s) | 2 | - | 2 |
| Completed college or technical school | - | 1 | 1 |
| University | - | - | - |
| Total | 10 | 4 | 14 |

TABLE 8

MARITAL STATUS OF PATIENTS

| Marital Status | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Single | 3 | 1 | 4 |
| Married | 6 | 3 | 9 |
| Divorced | 1 | - | 1 |
| Separated | - | - | - |
| Total | 10 | 4 | 14 |

TABLE 9

NUMBER OF OFFSPRING OF MS PATIENTS

| Number of Offspring | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| 0 | 2 | 2 | 4 |
| 1-2 | 5 | - | 5 |
| 3-5 | 3 | 2 | 5 |
| 6+ | - | - | - |
| Total | 10 | 4 | 14 |
| Mean | 1.8 | 2 | 1.8 |

TABLE 10

EMPLOYMENT STATUS OF MS PATIENTS

| Employment Status | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Employed | 3 | 1 | 4 |
| Not employed | 7 | 2 | 9 |
| Pensioned | - | 1 | 1 |
| Total | 10 | 4 | 14 |

TABLE 11

ETHNIC ORIGIN OF MS PATIENTS

| Ethnic Origin | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Canadian origin | 7 | 4 | 11 |
| Foreign born | 3 | - | 3 |
| Total | 10 | 4 | 14 |

TABLE 12

ORDINAL POSITION OF MS PATIENTS

| Position in Family | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Only child | 1 | 1 | 2 |
| Eldest child | 2 | 1 | 3 |
| Middle child | 5 | 1 | 6 |
| Youngest child | 2 | 1 | 3 |
| Twins | - | - | - |
| Total | 10 | 4 | 14 |

TABLE 13

CHILDHOOD HOME ENVIRONMENT OF MS PATIENTS

| Environment | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Broken homes | - | - | - |
| Unhappy childhood | 3 | - | 3 |
| Happy childhood | 7 | 4 | 11 |
| Total | 10 | 4 | 14 |

TABLE 14

AGE OF ONSET OF DISEASE OF MS PATIENTS
(INITIAL SYMPTOMS)

| Age of Onset | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Under 20 years | 5 | - | 5 |
| 20-29 years | 3 | 3 | 6 |
| 30-39 years | 2 | - | 2 |
| 40-49 years | - | 1 | 1 |
| Total | 10 | 4 | 14 |
| Mean Age | 22 | 29 | 24 |
| Range | 16-31 | 21-40 | 16-40 |

TABLE 15

INITIAL SYMPTOMS OF DISEASE OF MS PATIENTS

| Types of Observable Symptoms | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Motor | | | |
| - Balance | 2 | - | 2 |
| Sensory | | | |
| - Visual (Blurred or Double) | 4 | 1 | 5 |
| - Tactile (Numbness) | 8 | 3 | 11 |
| - Combination of visual and tactile | 1 | - | 1 |
| Speech | 1 | - | 1 |
| Total | 16 | 4 | 20[a] |

[a]Totals exceed number of subjects due to some patients responding with more than one initial symptom.

TABLE 16

TIME LAPSE BETWEEN FIRST SYMPTOMS AND MEDICAL DIAGNOSIS OF MS PATIENTS

| Time Period | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Less than 1 year | 2 | - | 2 |
| 1-5 years | 1 | 2 | 3 |
| 6-10 years | 4 | - | 4 |
| 11-15 years | - | 1 | 1 |
| 16-20 years | 1 | - | 1 |
| Over 20 years | 2 | 1 | 3 |
| Total | 10 | 4 | 14 |
| Mean (in years) | 12 | 6 | 10 |
| Range (in years | .5-30 | 2-13 | .5-30 |

TABLE 17

NUMBER OF DOCTORS SEEN PRIOR TO DIAGNOSIS OF MS PATIENTS

| Number of Doctors | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| 1-2 | 2 | 2 | 4 |
| 3-5 | 6 | 2 | 8 |
| 5+ | 2 | - | 2 |
| Total | 10 | 4 | 14 |
| Mean | 3.8 | 2.5 | 3.4 |
| Range | 2-7 | 1-4 | 1-7 |

TABLE 18

DURATION OF ILLNESS AND DEGREE OF DISABILITY

| Duration | Degree of Disability | | | | | | | | Total N = 14 |
|---|---|---|---|---|---|---|---|---|---|
| | Females N = 10 | | | | Males N = 4 | | | | |
| | A | C | W | Total | A | C | W | Total | |
| 5 or less years | 2 | - | - | 2 | 2 | - | - | 2 | 4 |
| 6-14 years | 3 | 1 | 1 | 5 | - | 1 | - | 1 | 6 |
| 15-24 years | 1 | - | - | 1 | 1 | - | - | 1 | 2 |
| 25 or more years | 2 | - | - | 2 | - | - | - | - | 2 |
| Total | 8 | 1 | 1 | 10 | 3 | 1 | - | 4 | 14 |

Note. A. Ambulatory patients

C. Cane patients

W. Wheelchair patients

TABLE 19

FAMILY HISTORY OF MS PATIENTS

| | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Family history of MS | 2 | 2 | 4 |
| No family history of MS | 8 | 2 | 10 |
| Total | 10 | 4 | 14 |

TABLE 20

MEMBERSHIP IN MS SOCIETY OF MS PATIENTS

| Membership Status | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Member | 9 | 4 | 13 |
| Nonmember | 1 | - | 1 |
| Total | 10 | 4 | 14 |

disease were primarily a combination of visual and tactile symptoms.

The MS patients in this study were primarily of Canadian origin. They reported that they had experienced happy childhoods. Almost one-half (6) of the sample was comprised of middle children, with oldest and youngest children in the next highest categories. Reports of additional cases of MS in the family were made by four of the subjects.

Research Questions

Results have been reported following the traditional format, which includes restatement of the research questions, presentation of pertinent data, and the drawing of appropriate conclusions.

Question 1. Are there discernible trends in the Full Scale IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

The distribution of Full Scale IQ scores for MS patients for the WAIS were classified according to the range of intelligence quotients. The results have been reported in Table 21. It was noted that eight of the patients were in the average range of ability and the distribution of the sample was essentially normal.

A summary of mean scores, variances, and standard deviations obtained for MS patients and the WAIS norming sample has been displayed in Table 22. The results for each individual in the MS sample on the WAIS have been reported in Table 23. It was noted that the Full Scale IQ scores for the MS sample (females, males, and total group) were in the average range of intelligence.

Conclusion. In this study there was no discernible differences

TABLE 21

DISTRIBUTION OF FULL SCALE INTELLIGENCE QUOTIENTS FOR MS PATIENTS ON THE WAIS

| Classification | Range of Intelligence Quotients | Number Patients | | |
|---|---|---|---|---|
| | | Female N = 10 | Male N = 4 | N = 14 |
| Very superior | 130 and above | - | - | - |
| Superior | 120 - 129 | 1 | - | 1 |
| Bright Normal | 110 - 119 | 2 | 2 | 4 |
| Average | 90 - 109 | 6 | 2 | 8 |
| Dull Normal | 80 - 89 | 1 | - | 1 |
| Borderline | 70 - 79 | - | - | - |
| Mental Defective | 69 and below | - | - | - |
| Total | | 10 | 4 | 14 |

Mean = 105.78

Standard Deviation = 10.22

TABLE 22

MEAN SCORES, VARIANCES, AND STANDARD DEVIATIONS FOR MS PATIENTS ON THE WECHSLER ADULT INTELLIGENCE SCALE

| | Sample Number | Mean Score | Variance | Standard Deviation |
|---|---|---|---|---|
| MS Patients | | | | |
| Full Scale IQ scores | 14 | 105.786 | 104.458 | 10.220 |
| Verbal IQ scores | 14 | 112.714 | 119.778 | 10.944 |
| Performance IQ scores | 14 | 96.000 | 122.000 | 11.045 |
| WAIS Norming sample | 1,700 | 100.00 | 225.00 | 15.00 |

TABLE 23

WAIS VERBAL, PERFORMANCE, AND FULL SCALE IQs FOR MS PATIENTS

| | Verbal IQ | Performance IQ | Full Scale IQ |
|---|---|---|---|
| Females: | | | |
| A | 97 | 90 | 93 |
| B | 92 | 82 | 87 |
| C | 105 | 89 | 98 |
| D | 120 | 91 | 108 |
| E | 127 | 115 | 123 |
| F | 118 | 92 | 108 |
| G | 115 | 110 | 114 |
| H | 100 | 96 | 98 |
| I | 114 | 103 | 109 |
| J | 117 | 99 | 110 |
| Males: | | | |
| K | 129 | 95 | 115 |
| L | 109 | 72 | 93 |
| M | 126 | 109 | 119 |
| N | 109 | 101 | 106 |
| Mean Females | 110.5 | 96.7 | 104.8 |
| Mean Males | 118.2 | 94.2 | 108.2 |
| Mean Group | 112.7 | 96 | 105.7 |
| WAIS Norms | 100 | 100 | 100 |

on the WAIS Full Scale IQs between the MS sample and the WAIS norming sample.

Question 2. Are there discernible trends on the Verbal IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

A summary of the scores obtained by the MS patients on the verbal subtests of the WAIS was compiled. Results have been reported in Table 24. Four of the MS patients (2 females and 2 males) obtained Verbal IQ scores in the superior range (see Table 23); however, the mean Verbal IQ scores for the total MS sample was in the bright normal range of ability (Table 22). Both females and males obtained mean scores in the superior range on the Comprehension subtest and above average mean scores on the Similarities subtest. The mean score obtained by females on the Digit Span subtest was below average.

Conclusions. In this study the mean Verbal IQ of the MS patients was above average. This was primarily due to the high scores obtained on the Comprehension and Similarities subtests. Females obtained a mean score below average on the Digit Span subtest.

Question 3. Are there discernible trends on the Performance IQ scores obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

A summary of the scores obtained by the MS patients on the performance subtests of the WAIS was compiled. Results have been reported in Table 25. Three of the MS patients (2 females and 1 male) obtained Performance IQ scores in the below average or dull normal range (Table 23). The mean Performance IQ for the total group was at

TABLE 24

WAIS VERBAL SCALED SCORES FOR MS PATIENTS

| Subjects | Subtests: Information | Comprehension | Arithmetic | Similarities | Digit Span | Vocabulary | Verbal IQ |
|---|---|---|---|---|---|---|---|
| | Scaled Scores | | | | | | |
| Females: | | | | | | | |
| A | 7 | 9 | 10 | 11 | 10 | 9 | 97 |
| B | 6 | 11 | 5 | 12 | 10 | 9 | 92 |
| C | 13 | 13 | 11 | 16 | 2 | 11 | 105 |
| D | 14 | 19 | 10 | 13 | 14 | 13 | 120 |
| E | 13 | 17 | 17 | 15 | 12 | 14 | 127 |
| F | 11 | 18 | 11 | 12 | 15 | 12 | 118 |
| G | 10 | 16 | 12 | 14 | 12 | 11 | 115 |
| H | 12 | 14 | 8 | 11 | 2 | 11 | 100 |
| I | 8 | 19 | 13 | 12 | 11 | 11 | 114 |
| J | 10 | 18 | 8 | 16 | 10 | 11 | 117 |
| Males: | | | | | | | |
| K | 12 | 19 | 17 | 14 | 15 | 12 | 129 |
| L | 14 | 14 | 9 | 10 | 9 | 14 | 109 |
| M | 13 | 19 | 12 | 13 | 12 | 15 | 126 |
| N | 8 | 14 | 11 | 15 | 9 | 10 | 109 |
| Mean Female | 10.2 | 15.4 | 10.5 | 13.2 | 8.2 | 11.2 | 110.5 |
| Mean Male | 11.7 | 16.5 | 12.2 | 13.0 | 11.2 | 12.7 | 118.2 |
| Mean Group | 10.6 | 15.7 | 11.0 | 13.1 | 9.1 | 11.6 | 112.7 |
| WAIS Norms | 10 | 10 | 10 | 10 | 10 | 10 | 100 |

Note. A scaled score of 10 is average for the general population.

TABLE 25

WAIS PERFORMANCE SCALED SCORES FOR MS PATIENTS

| Subject | Subtests: Digit Symbol | Picture Completion | Block Design | Picture Arrangement | Object Assembly | Performance IQ |
|---|---|---|---|---|---|---|
| | Scaled Scores | | | | | |
| Females: | | | | | | |
| A | 8 | 11 | 9 | 8 | 7 | 90 |
| B | 9 | 11 | 8 | 6 | 2 | 82 |
| C | 5 | 9 | 9 | 9 | 9 | 89 |
| D | 9 | 7 | 9 | 10 | 8 | 91 |
| E | 14 | 11 | 11 | 12 | 13 | 115 |
| F | 8 | 8 | 8 | 9 | 7 | 92 |
| G | 11 | 12 | 10 | 8 | 13 | 110 |
| H | 6 | 11 | 6 | 6 | 9 | 96 |
| I | 8 | 8 | 11 | 10 | 11 | 103 |
| J | 5 | 9 | 7 | 6 | 9 | 99 |
| Males: | | | | | | |
| K | 8 | 11 | 8 | 9 | 11 | 95 |
| L | 3 | 9 | 8 | 6 | 2 | 72 |
| M | 8 | 13 | 6 | 9 | 11 | 109 |
| N | 5 | 13 | 11 | 7 | 6 | 101 |
| Mean Female | 8.3 | 9.7 | 8.8 | 8.4 | 8.8 | 96.7 |
| Mean Male | 6 | 11.5 | 8.2 | 7.7 | 7.5 | 94.2 |
| Mean Group | 7.6 | 10.2 | 8.6 | 8.2 | 8.4 | 96.0 |
| WAIS Norms | 10 | 10 | 10 | 10 | 10 | 100 |

Note. A scaled score of 10 is average for the general population.

the lower end of the average range of ability. The mean scores obtained by the females and males were below average on all subtests of the performance section except Picture Completion (Table 25). The mean scores obtained by males on the Digit Symbol subtest were in the borderline range of ability.

Conclusion. In this study, the MS patients obtained below average scores on all performance subtests on the WAIS except Picture Completion. The mean Performance IQ was in the average range of ability. It was interesting to note that the Picture Completion subtest was the only performance subtest that did not require motor skills, and this group had their highest mean performance scores in this area (Table 23).

Question 4. Are there discernible trends on individual WAIS subtests obtained for this MS sample that are different from the WAIS norming sample on the Wechsler Adult Intelligence Scale?

Profiles for the females, males, and the total MS sample have been displayed in Figures 1, 2, and 3. These profiles confirmed the results outlined under research questions 2 and 3. All three groups scored in the superior range on the Comprehension subtest, above average on the Similarities subtest, and below average on all performance subtests except Picture Completion.

Conclusion. In this study, there was a trend for MS patients to score above average on Comprehension and Similarities, and below average on performance tasks requiring motor skills.

Question 5. Are the WAIS profiles of this MS sample consistent or inconsistent with profiles obtained from other research studies

PREVIOUSLY COPYRIGHTED MATERIAL,

LEAVES 90-92, NOT MICROFILMED.

WAIS MEAN PROFILE OF FEMALE MS PATIENTS, WAIS MEAN PROFILE OF MALE MS PATIENTS, AND TOTAL GROUP WAIS MEAN PROFILE OF MS PATIENTS shown on WAIS Test Profile (Wechsler Adult Intelligence Scale), Consulting Psychologists Press, 577 College Avenue, Palo Alto, California 94306, U.S.A.

reviewed in Chapter III?

Of the research assessing the intelligence of MS patients, only three studies used the WAIS as a test instrument. In the Fink and Houser (1966) study a number of the subjects did not complete the performance subtests requiring motor skills. Complete data from the remaining two studies (Goldstein & Shelly, 1974; Matthews et al., 1970) were available. A summary showing the mean scaled scores obtained on the individual subtests of the WAIS in these two MS studies and in the present study was compiled. Results have been reported in Table 26. In all three studies, the scores on all the verbal subtests except Digit Span were in the average or above average range of ability. Although the Digit Span scores were below the established mean of 10, all three mean scores of the Digit Span subtest were still in the average range of ability. On the performance subtests the mean scores obtained on Picture Completion were in the average range in all three studies. All other performance subtests were below average except the mean score for Block Design in the Matthews et al. (1970) study. The Verbal IQ scores were consistently higher than the Performance IQ scores for all these studies.

Conclusion. In comparing the present study with the two previous studies using the WAIS, it was found that the MS subjects consistently obtained higher Verbal IQ scores than Performance IQ scores. Of the verbal subtests, Digit Span was consistently the lowest; of the performance subtests, Picture Completion was consistently the highest.

TABLE 26

MEAN SCALED SCORES FOR TWO PREVIOUS MS STUDIES COMPARED TO PRESENT STUDY USING THE WAIS

| WAIS Subtests | Source of Data: Matthews, Cleeland, and Hopper 1970 N = 30 | Goldstein and Shelly 1974 N = 20 | Present Study 1976 N = 14 |
|---|---|---|---|
| Verbal | | | |
| Information | 10.73 | 11.90 | 10.64 |
| Comprehension | 11.27 | 12.90 | 15.71 |
| Arithmetic | 10.30 | 12.25 | 11.00 |
| Similarities | 10.60 | 11.60 | 13.14 |
| Digit Span | 9.33 | 9.80 | 9.14 |
| Vocabulary | 11.10 | 11.45 | 11.64 |
| Performance | | | |
| Digit Symbol | 7.47 | 6.11 | 7.64 |
| Picture Completion | 9.43 | 10.58 | 10.21 |
| Block Design | 9.80 | 8.79 | 8.64 |
| Picture Arrangement | 8.13 | 8.37 | 8.21 |
| Object Assembly | 8.37 | 8.16 | 8.43 |
| Verbal IQ | 103.40 | 110.65 | 112.71 |
| Performance IQ | 94.67 | 96.26 | 96.00 |
| Full Scale IQ | 99.57 | 104.21 | 105.78 |

Question 6. Are there discernible trends on the sten scores obtained for this MS sample that are different from the IPAT general population norming sample on the IPAT Anxiety Scale Questionnaire?

The distribution of anxiety sten scores for the MS patients on the IPAT was classified according to the range of anxiety scores (Table 27). A summary of the mean scores and the standard deviations of MS patients and the IPAT norming sample was compiled. Results have been reported in Table 28. The raw scores and the sten scores obtained by the individual MS patients have been displayed in Table 29.

It was interesting to note that 8 of the 14 MS patients were borderline or overly anxious. The mean scores obtained by males and the total MS group were consistently higher than those obtained by the IPAT norming samples. All three sten scores (females, males, and total MS group) were above the average sten score of 5.5 and in the average to borderline range of anxiety, with males scoring somewhat higher than females.

Conclusion. In this study, MS patients tended to have higher scores than the norming sample on the IPAT Anxiety Scale (Self Analysis Form). The mean sten scores for the MS patients were in the average to borderline anxious range, with the male MS group scoring somewhat higher than females.

Question 7. What are the mean scores on each scale of the MMPI for females, males, and the total MS sample? Do common personality trends exist?

Question 8. How many MS patients scored below the T score of 30 or above the T score of 70 on each MMPI scale?

TABLE 27

DISTRIBUTION OF ANXIETY STEN SCORES FOR MS PATIENTS ON THE IPAT

| Classification | Range of Anxiety Score (Sten) | Number of Patients: Female N = 10 | Male N = 4 | Total N = 14 |
|---|---|---|---|---|
| Stable, secure, and good mental health | 1, 2, 3 | 2 | 1 | 3 |
| Average | 4, 5, 6 | 3 | 0 | 3 |
| Borderline | 7 | 2 | 1 | 3 |
| Psychologically morbid, and social and emotional adjustment problems | 8, 9, 10 | 3 | 2 | 5 |
| Total | | 10 | 4 | 14 |

Mean Sten Score = 6.57

TABLE 28

MEAN SCORES, VARIANCES, AND STANDARD DEVIATIONS OF MS PATIENTS AND IPAT NORMING SAMPLE

| Group | Number | Mean | Variance | Standard Deviation |
|---|---|---|---|---|
| Female MS | 10 | 32.9 | 238.32 | 15.43 |
| Female Norming Sample | 405 | 28.6 | 127.69 | 11.3 |
| Male MS | 4 | 37.25 | 428.25 | 20.69 |
| Male Norming Sample | 530 | 25.7 | 125.44 | 11.2 |
| Total MS | 14 | 34.143 | 267.98 | 16.4 |
| Total Norming Sample | 935 | 27.1 | 129.96 | 11.4 |

TABLE 29

IPAT, SELF ANALYSIS FORM RAW SCORES AND STEN SCORES OF MS PATIENTS

| Subjects | | Raw Scores: Female | Raw Scores: Male | Sten Scores |
|---|---|---|---|---|
| Females: | A | 61 | | 10 |
| | B | 29 | | 6 |
| | C | 36 | | 7 |
| | D | 41 | | 8 |
| | E | 17 | | 3 |
| | F | 53 | | 9 |
| | G | 29 | | 6 |
| | H | 13 | | 3 |
| | I | 19 | | 4 |
| | J | 31 | | 7 |
| Males: | K | | 11 | 3 |
| | L | | 59 | 10 |
| | M | | 47 | 9 |
| | N | | 32 | 7 |

| | Female | Male | Group | Female | Male | Group |
|---|---|---|---|---|---|---|
| Mean | 32.9 | 37.25 | 34.14 | 6.3 | 7.25 | 6.57[a] |
| Standard Deviation | 15.43 | 20.69 | 16.37 | | | |

[a]Average sten score is 5.5.

Mean profiles of MS patients (females, males, and the total MS group) on the MMPI have been displayed in Figure 4. The number of MS patients who had T scores higher than 70 (clinically significant) have been presented in Table 30. None of the MS patients in this study obtained T scores below 30 on any of the MMPI scales. The validity scales (L, F, and K) showed an F scale above 60, with L and K somewhat lower. This profile has been indicative of patients who have carefully completed the test instrument, who admit emotional difficulties, and who request help (Duckworth & Duckworth, 1975).

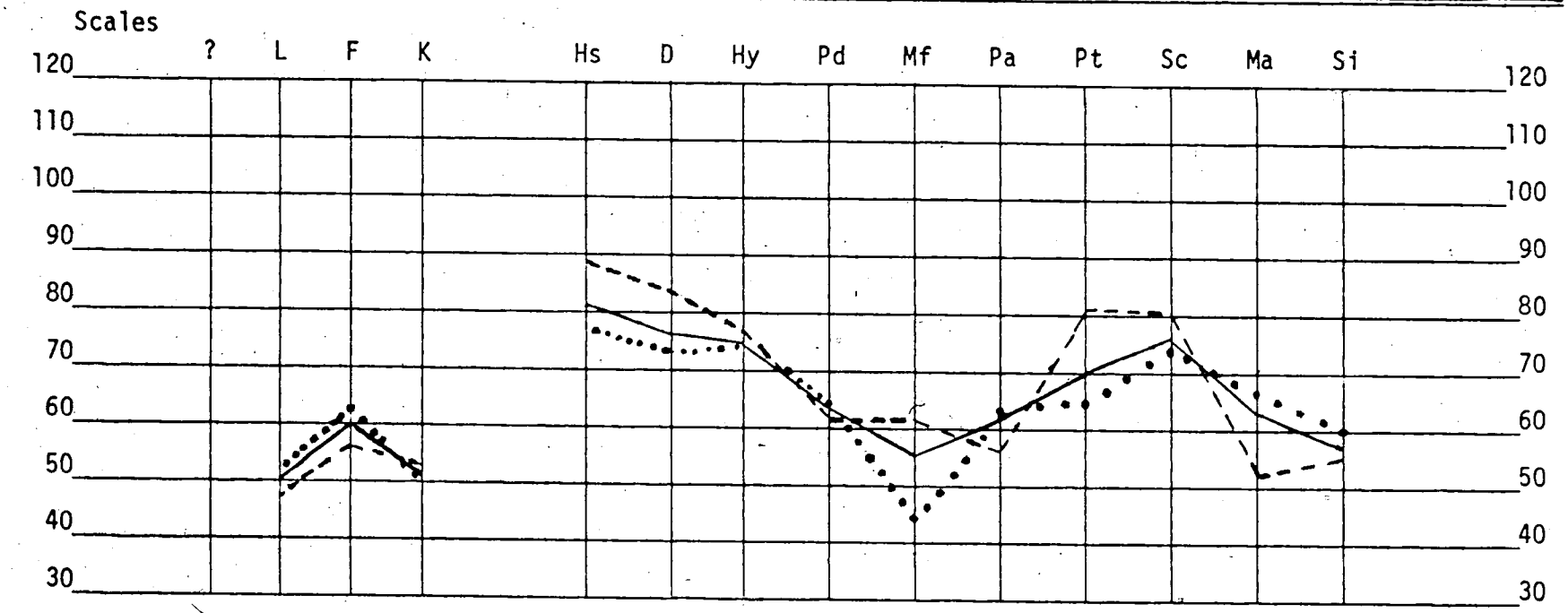
It was interesting to note that the three profiles were all elevated (above 70) on the neurotic triad scale (Hypochondriasis, Depression, and Hysteria). The number of patients with scores above the T of 70 on these three scales confirmed that the neurotic triad was evident in a number of the patients.

Both the mean scores and the number of patients (9) scoring above 70 on the Schizophrenia scale, indicated the possibility that feelings of alienation, poor social relationships, and general inability to cope were characteristic of MS patients in this study. The males obtained considerably higher scores than did the females on the Psychasthenia scale which indicated the possibility that the anxiety factor was more prevalent in males than in females. Females had a lower average profile on most of the scales.

Conclusion. In this study both males and females showed indications of elevated scores on the neurotic triad and Schizophrenia scale; however, males scored considerably higher than females on the Psychasthenia scale. Females obtained a lower overall profile

FIGURE 4

MMPI MEAN PROFILES OF MS PATIENTS




| T Scores | | ? | L | F | K | Hs | D | Hy | Pd | Mf | Pa | Pt | Sc | Ma | Si |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Female | | 51 | 62 | 50 | 78 | 74 | 75 | 64 | 44 | 62 | 65 | 75 | 67 | 60 |
| | Male | | 48 | 57 | 52 | 89 | 84 | 78 | 61 | 62 | 57 | 81 | 80 | 52 | 55 |
| | Group | | 50 | 60 | 51 | 81 | 77 | 75 | 63 | 56 | 61 | 70 | 77 | 63 | 58 |

····· Female Mn ------- Male Mn ——— Group Mn

TABLE 30

NUMBER OF MS PATIENTS WITH SCORES ABOVE 70 ON THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

| Scales | Females N = 10 | Males N = 4 | Total N = 14 |
|---|---|---|---|
| Validity Scales | | | |
| L | - | - | - |
| F | 2 | - | 2 |
| K | - | 1 | 1 |
| Clinical Scales | | | |
| Hs | 6 | 4 | 10 |
| D | 5 | 3 | 8 |
| Hy | 6 | 4 | 10 |
| Pd | 3 | - | 3 |
| Mf | - | - | - |
| Pa | 1 | - | 1 |
| Pt | 4 | 3 | 7 |
| Sc | 6 | 3 | 9 |
| Ma | 3 | - | 3 |
| Si | 3 | 1 | 4 |

Note. No MS patient, female or male, scored below the T score of 30 on any MMPI scale.

than did males on the MMPI.

Summary

In this study, MS patients obtained verbal scores higher than performance scores on the WAIS. There was a trend for patients to score low on Digit Span and all performance subtests except Picture Completion, and high on Comprehension and Similarities. MS patients showed a tendency to have above average anxiety scores on the IPAT, with males scoring somewhat higher than females. Males also scored higher on the Psychasthenia scale on the MMPI, thus confirming that the males in this study had higher mean scores on anxiety measures than did females. All MS patients in this study had elevated scores on the neurotic triad (Hs, D, and Hy) and the Schizophrenia scale (Sc).

# CHAPTER VI

## DISCUSSION AND CONCLUSIONS

The central purpose of this descriptive survey was to provide current information on MS patients in Edmonton. Pertinent data gathered in this survey were presented in Chapter V and have been discussed in the following sections.

### Demographic Data

The female to male ratio found in this study was 2.5 to 1 which appeared to be considerably higher than the average ratio of the 10 studies (1.9 to 1) reported by McAlpine, Lumsden, and Acheson (1972). It was possible that the proportion of females may be higher than the proportion of males in the target population for the present study; however, it has been found that females are generally more likely to volunteer for research than are males (Rosenthal & Rosnow, 1975).

Of the 14 subjects in this sample 8 experienced the initial symptoms of the disease within the projected age limits of 20 to 40 years. The Multiple Sclerosis Society of Canada has predicted this age range as the most common period for medical diagnosis of the disease. However [illegible] of the patients in this study (all females) experienced the [illegible]isease symptoms prior to the age of 20 years. Cases as young as [illegible] old as 60 years of age have been reported, but these cases have [illegible]een common (Currier et al., 1974). In addition, the majority of [illegible] patients in this study saw more than

three doctors before a final diagnosis was made. The author suggests that the ambiguous nature of MS has made diagnosis difficult, and this problem of the time lapse between the first observable symptom(s) and medical confirmation could account for the fact that patients experienced symptoms at a younger age than the literature would have led one to expect, but that diagnosis was made within the projected age limits. Therefore, it would appear that additional means of educating the public on the signs and symptoms of this disease would be of benefit to the community as a whole.

The females in the sample tended to report a proportionately higher number of initial symptoms than did males. In general, it appeared that females have concentrated on the disease symptoms and thus were able to identify the initial symptoms and attempted to seek early medical assistance. This may be the result of the traditional concept that it has been more acceptable for females than for males to concentrate on and relate to numerous physical ailments.

It was noted that only 4 of the sample of 14 (3 females and 1 male) were employed. The nature of MS, with reoccurring attacks (exacerbations and remissions), may make employment difficult because the disease may interfere with the normal expectations of work routines (for example, being at work on a daily basis).

In this study 4 of the sample reported having blood relatives with MS. It may be possible that a genetic or hereditary factor may be involved to some extent. Subsequently, more research should be encouraged to explore this possibility.

Research Questions

Wechsler Adult Intelligence Scale (WAIS). The data from this study indicated that the distribution of the intelligence quotients of MS patients was essentially normal. There was a trend for MS patients to score higher on the Verbal IQ than on the Performance IQ. These results were consistent with studies of Goldstein and Shelly (1974); Matthews, Cleeland, and Hooper (1970); and Reitan, Reid, and Dyken (1971). It is possible that MS patients compensated for their physical disabilities by emphasizing the development of verbal skills. On the other hand, the study of Canter (1951a) indicated that MS patients experience a loss of motor speed in performance tasks. Therefore, the possibility existed that the MS patients used in this study had above average intelligence but the scores on the motor tasks were depressed due to the physical disability of the subjects.

On the other hand, Philippopoulos et al. (1958) found no significant difference between Verbal, Performance, and Full Scale IQs using the Wechsler-Bellevue (W-B); however; because statistical analyses were not used in the present study, it was not possible to determine if the trends established in this study were statistically significant. In addition, although the WAIS is essentially derived from the W-B scales, differences may exist between the two tests.

In examining the individual subtests of the WAIS, it was found that MS patients in the present study scored above average on Comprehension and Similarities, and below average on Digit Span on the verbal subtests. On the performance section, they scored below average on all subtests except Picture Completion, which is the only

subtest in this section which did not require motor skills.

The low scores on Digit Span and most performance subtests supported the results found in previous research (Chapter III). The consistency in which these subtests have been found to be below average for MS patients could indicate the loss of the ability of MS patients to cope with timed, motor tasks. In addition, as stated by Harrower (1951), auditory memory did appear to be the most vulnerable trait for MS patients.

The above average Comprehension and Similarities subtest scores found in this study were not found in most MS studies (for example, Goldstein & Shelly, 1974; Matthews et al., 1970) and were contradictory to the results of Parsons et al. (1957) and Philippopoulos et al. (1958) who found lower scores in areas requiring abstracting and conceptualizing ability.

Although Fink and Houser (1966) ruled out the possibility of any cause-effect relationship between physical disability and Verbal IQ, they supported the view that the lowered IQ and increased disability could both be consequences of the MS disease. Parsons et al. (1957) postulated that a parallel existed between the degree of abstracting disability and the extent of neurological disturbance. Although there were 2 subjects using canes and 1 in a wheelchair, none of the other patients in this study were in the obvious, acute stages of physical disability, and all 14 patients were functioning at home. The present author suggests that the higher scores in Comprehension and Similarities found in this study may be accounted for by the fact that patients in this study were not in the obvious, acute

stages of the disease and may not be comparable to the hospitalized patients used in previous studies.

IPAT Anxiety Scale Questionnaire (Self Analysis Form). Parallel to the results of the WAIS, the data from this study indicated that the distribution of scores obtained by the MS patients on the IPAT was essentially normal. Three of the 14 subjects (2 females and 1 male) scored within the sten range of 1 to 3, which suggested that these subjects were stable and secure. In addition, three females scored between the sten scores of 4 and 6, which was still within the average range of anxiety. The remainder of this MS sample (5 females and 3 males) were classified as borderline or overly anxious with sten scores ranging from 7 to 10.

The mean sten scores of patients in this study were in the average to borderline high range of anxiety, with males scoring somewhat higher than females. These results indicated some contradiction to the research of Cottrell and Wilson (1926), Fink and Houser (1966), Jelliffe (1921, 1922), and Ross and Reitan (1926) whose findings indicated that high anxiety levels existed among MS patients. However the mean scores of the present study provided only limited support for the findings of Braceland and Griffin (1950), Grinker, Ham, and Robbins (1950), and Pratt (1951) who found normal levels of anxiety on MS patients. The author would suggest that patients who volunteer to participate in studies may be the more confident and therefore the less anxious of the MS people. The criteria established by the author for participation in the study may also have limited the assumptions that can be generalized back to the target population.

The anxiety found on the IPAT scale was reinforced by the MMPI results. The MMPI scale, Psychasthenia (Pt), was very high for the males in this study. Because of the consistency of the findings on the two scales (IPAT and Pt) the author would suggest that the two scales are, in fact, measuring the same thing--anxiety.

The high indications of anxiety on these tests supported Harrower's (1951) view that patients who are not in the MS stages of exacerbation express more anxiety than patients who are in the acute stages of the disease. Patients in the acute stages tended to reveal low inner tension.

Results indicated that the MS sample scored low on Digit Span, the WAIS subtest most sensitive to anxiety. Although Arithmetic is also sensitive to anxiety, the author postulates that the average score obtained in this area was directly related to the fact that most patients in this sample were not in the obvious acute stages of MS. The low mean scores obtained on timed performance subtests may have reflected anxiety as well as poor motor skills.

Minnesota Multiphasic Personality Inventory (MMPI). Examination of the MMPI mean profiles indicated some common trends for this MS study sample. Validity scales (L, F, and K) indicated a peak on F with L and K slightly lower for all three groups (females, males, and total). Elevations for all groups were clinically significant on the three scales that comprise the neurotic triad: Hysteria (Hs), Hypochondriasis (Hy), and Depression (D). Another scale on which the mean scores of all three groups were above 70, was the Schizophrenia (Sc) scale which focused on unusual or bizarre thoughts or

behavior. However, the three groups differed on the Psychasthenia (Pt) scale. Three males (three-quarters of the males) scored in the abnormal range resulting in a higher mean T score level than obtained by the female group whose average score was not above the clinically significant level.

The validity scales indicated that the results of this study appeared to be valid; patients appeared to follow instructions by reading and answering the items carefully. The direction of the peak of F in relation to L and K was indicative of patients who admitted emotional difficulties and requested help.

The elevation found on the neurotic triad was consistent with most MMPI research on MS patients since 1950 (Baldwin, 1952; Canter, 1951b; Grinker et al., 1950; Ross & Reitan, 1955; Schontz, 1955). Research prior to 1950 (for example, Sugar & Nadell, 1943) was conducted primarily by neurologists who used observational and questionnaire techniques. Findings prior to this time conflicted, with euphoria being one extreme and depression being another.

Elevation on the three scales comprising the neurotic triad (Hs, D, and Hy) has been indicative of a declining health profile; patients have been diagnosed as neurotic, depressed, and clinically anxious. In addition, patients have been seen as demonstrating somatic overconcern manifested by hypersensitivity to minor dysfunction and minor complaints without adequate physical pathology. Symptoms have been likely to involve aches, pains, weakness, vision problems, peculiarities of sensation, and hypochondrial trends. Despite frequent visits to a doctor, the medical status of these patients has remained

relatively constant and unchanging. At least one MMPI interpretation manual (Lachar, 1974) has indicated that patients with bonafide physical diseases do not obtain high elevation (more than 55-65 T) on the Hs scale. The moodiness as indicated by the D scale has typically left the patient with feelings of hopelessness. Scale 3, Hy has commonly been indicative of anxiety attacks and headaches.

Somatic delusions appeared to be the underlying theme of the above scales. The ambiguous nature of the MS disease included most of the symptoms outlined above. The author therefore suggests that careful scrutiny of all possible medical causes would avoid misclassification of this information on patients.

T scores over 70 on the Schizophrenia (Sc) scale have usually been indicative of individuals who relate poorly to others, have poor family relations, feelings of alienation, peculiarities of perception, difficulties of concentration, and who attempt to escape from reality pressures (Gilberstadt & Duker, 1965; Lacher, 1974). The MS disease has not allowed the patient to predict or plan for the future and, as a result, has caused interference with interpersonal relationships. The author found that during the personal interviews of this study, individuals verbalized the frustration and the negative impact on their self-images created by the symptoms which were not medically substantiated for sometime. Therefore, these individuals need therapeutic help in overcoming the negative impact on their self-images and assistance in reestablishing social and family relationships.

In addition to the anxiety mentioned previously, patients who scored high on the Psychasthenia (Pt) scale have been typically

diagnosed as individuals who over-reacted to and showed extreme concern over any medical problems, and who manifested rigidity and fearfulness. It is suggested that males scored higher than females on this scale as these symptoms have traditionally been less acceptable in males than in females. It was noted that the mean raw score on this scale for males was 38 and for females it was 34.5. If the raw score of 38 (males raw score) was transposed onto the female norms, a T score of 71 was found rather than the T score of 81 which was found on the male norms, thus indicating that males are in fact, discriminated against for the test answers.

In summary, the mean profiles of the MMPI scaled scores obtained in this sample indicated that the common trends toward elevation of the neurotic triad and the Schizophrenia scores existed in MS patients. Males scored in the clinically significant range on the Psychasthenia scale in contrast to females who scored in the average range on this scale.

Implications for Future Research

1. In this study, comparison between females and males was not possible because of the disproportionate sex ratio. It is suggested that future research using equal numbers of males and females be done to provide this comparison.

2. It was suggested (Baldwin, 1952; Parsons et al., 1957) that a parallel existed between neurological impairment and intellectual deterioration. In view of the fluctuating nature of the MS disease, which is characterized by exacerbations and remissions, the relationship between the disease and any deterioration can only be

determined by a longitudinal study.

3. In view of the lack of information and understanding about the disease, public educational programs are required to facilitate understanding of the disease, and support of research both personally and financially.

4. This study suggests that, in addition to affective disturbances, impairment of intellectual functions occurred in a high proportion of MS patients. Cognizance of these facets of the disease should be valuable to the physician and/or the psychologist in assisting the patient to adjust to his or her problems with maximal efficiency within the framework of the patient's limitations.

5. On the MMPI, the validity scales indicated that the patients in this sample were individuals who admitted emotional difficulties and requested help. The elevation on the Schizophrenia (Sc) scale indicated that these patients experienced social alienation and interpersonal problems. In addition, the literature suggested that "the M.S. patient needs someone to talk to, some one to communicate with and someone who understands" (Szumlas, Note 1). This need was also personally felt by the author during the personal interviews with the patients. The establishment of a counseling program is of primary concern to the MS patient.

6. The majority of studies on MS patients have used hospitalized patients as subjects. Research using samples from other populations is required to determine the generalizability of any results.

Summary

In this descriptive survey, two distinct areas were presented: the demographic data and the research questions.

Information gathered in the demographic survey included relevant personal facts about MS patients such as sex, age, education, marital status, number of offspring, and employment status. In addition, background information such as ethnic origin, ordinal position, and home environment was collected. The pertinent medical information (age of onset, initial symptoms, period between first symptoms and medical diagnosis, number of doctors seen prior to diagnosis, duration of the disease, family history, and membership in the MS society) was also obtained from the patients. The demographic data were categorized and presented in tables.

Examination of the research questions indicated that the Verbal IQ scores for this MS sample were higher than the Performance IQ scores. Digit Span was the lowest subtest on the verbal section and Comprehension and Similarities were high. On the performance section, Picture Completion was the highest subtest with all other timed subtests being in the low average or below average range. The IPAT results indicated a tendency toward elevated anxiety scores with males scoring somewhat higher than females. Consistent with the anxiety measured on the IPAT, a similar trend toward high anxiety was noted on the MMPI for males. Examination of the MMPI mean profiles indicated clinically significant T scores on the neurotic triad (Hs, D, and Hy) and on the Schizophrenia scale (Sc) for all patients. The mean scores on the Psychasthenia scale (Pt) were significant on

the male profile, but not on the female profile.

The demographic information collected, together with the results obtained from examining the research questions were discussed and possible conclusions were drawn. Implications for future research were presented.

# REFERENCE NOTES

## REFERENCE NOTES


1. Szumlas, F. J. An epidemiological survey of m.s. in southern Alberta. Government of Canada Report. (Available from the Multiple Sclerosis Society of Canada, Prairie Division, 641 Tegler Building, Edmonton, Alberta.) 1974.

2. Braunel, L. M., James, C. A., & Stoval, J. D. MS is a family affair. Chicago, Illinois: The National Easter Seal Society for Crippled Children and Adults, 1972.

3. Hader, W. J. Current developments in multiple sclerosis research. A Report to the Prairie Division Annual Meeting, Moose Jaw, May, 1976.

4. Hader, W. J. Multiple sclerosis survey: University Hospital, Saskatoon, Saskatchewan, 1955 to 1970. As prepared for presentation at the 3rd Annual Meeting of the Prairie Division Multiple Sclerosis Society of Canada, October, 1971.

5. Haber, L. D. Prevalence of disability among noninstitutionalized adults under age 65: 1966 survey of disabled adults. United States Department of Health, Education and Welfare, Research and Statistics, 4, February 20, 1968.

6. Harrower, M. R. Mental health and MS. National Multiple Sclerosis Society, 1953.

7. Multiple sclerosis facts. Pamphlet. (Available from Multiple Sclerosis Society of Canada, Prairie Division, 641 Tegler Building, Edmonton, Alberta.)

8. Lee, R. G. Multiple sclerosis: Where we stand in 1974. Paper presented at the 1974 Assembly, Prairie Division Multiple Sclerosis Society of Canada: and Calgary Chapter Multiple Sclerosis Society of Canada, Calgary, Alberta.

9. Multiple sclerosis prairie news. Edmonton: Prairie Division Multiple Sclerosis Society of Canada, 1974.

10. Edmonton Chapter, Multiple Sclerosis Society of Canada. Newsletter, Summer, 1976. (Available from 641 Tegler Building, Edmonton, Alberta.)

11. Redford, J. B. Rehabilitation medicine and multiple sclerosis. A presentation to the 1973 Assembly, Prairie Division Multiple Sclerosis Society of Canada: and Edmonton Chapter Multiple Sclerosis Society of Canada, Edmonton, Alberta.

12. Hader, W. J. Current developments in multiple sclerosis research. A Report to the Prairie Division Annual Meeting, Winnipeg, February, 1975.

# BIBLIOGRAPHY

# BIBLIOGRAPHY

Acheson, E. D. MS in British Commonwealth countries in southern hemisphere. British Journal of Preventive Social Medicine, 1961, 15, 118.

Alter, M., & Kurtzke, J. F. (Eds.). The epidemiology of multiple sclerosis. Illinois: Charles C. Thomas, 1968.

Baldwin, M. V. A clinico-experimental investigation into the psychologic aspects of multiple sclerosis. The Journal of Nervous and Mental Disease, 1952, 115, 229.

Beebe, G., Kurtzke, J. F., Karland, L. T., Auth, T. L., & Nagler, B. Studies on the natural history of MS. Neurology Minnesota, 1967, 17, 2.

Borberg, N. C., & Zahle, V. On the psychopathology of disseminated sclerosis. Acta Psychiatrica et Neurologica Scandinavia, 1946, 21, 74-89.

Braceland, F. J., & Giffin, M. E. The mental changes associated with multiple sclerosis (an interim report). In H. W. Woltman, H. H. Merritt, S. B. Wortis & C. C. Hare (Eds.), Multiple sclerosis and the demyelinating diseases. Baltimore: Williams & Wilkins Company, 1950, p. 28.

Brown, S., & Davis, T. K. The mental symptoms of multiple sclerosis. In C. L. Dana, S. E. Jelliffe, H. A. Filey, F. Tilney & W. Timme (Eds.), Multiple sclerosis [disseminated sclerosis]. New York: Paul B. Hoeber, 1922, pp. 76-82.

Burgemeister, B. B., & Tallman, G. Rorschach patterns in multiple sclerosis. Rorschach Research Exchange, 1945, 9, 111-122.

Campbell, W. G. A form book for thesis writing. San Francisco: Houghton Mifflin, 1939.

Canter, A. H. Direct and indirect measures of psychological deficit in multiple sclerosis: Part I. The Journal of General Psychology, 1951, 44, 3-25.

Canter, A. H. MMPI profiles in multiple sclerosis Journal of Consulting Psychologists, 1951, 15, 253-256.

Capps, H. M. Vocabulary changes in mental deterioration. Archives of Psychology, 1939, 34, 242.

Cattell, R. B., & Scheier, I. H. The meaning and measurement of neuroticism and anxiety. New York: Ronald Press, 1961.

Cattell, R. B., & Scheier, I. H. Handbook for the IPAT Anxiety Scale Questionnaire (Self analysis form). Champaign: Institute for Personality and Ability Testing, 1963.

Cottle, W. C. Card versus booklet forms of the MMPI. Journal of Applied Psychology, 1950, 34, 255-259.

Cottrell, S. S., & Wilson, S. A. K. The affective symptomatology of disseminated sclerosis. The Journal of Neurology and Psychopathology, 1926, 7, 1-30.

Crafts, L. W., Schneirla, T. C., Robinson, E. E., & Gilbert, R. W. Recent experiments in psychology. New York: McGraw-Hill, 1938.

Cronbach, L. J., & Meehl, P. E. Construct validity in psychological tests. Psychological Bulletin, 1955, 52, 281-302.

Currier, R. D., Martin, E. A., & Woosley, P. C. Prior events in multiple sclerosis. Neurology, 1974, 24, 748-754.

Dahlstrom, W. G., Welsh, G. S., & Dahlstrom, L. E. An MMPI handbook: clinical interpretation (Vol. 1). Minneapolis: University of Minnesota, 1972.

Dahlstrom, W. G., & Welsh, G. S. An MMPI handbook: A guide to use in clinical practice and research. Minneapolis: University of Minnesota Press, 1960.

Dampier, B. Multiple sclerosis: Is that a light at the end of the tunnel? Macleans, March 22, 1976.

Davidson, P. O., & Costello, C. G. N = 1: Experimental studies of single cases. Toronto: D. Van Nostrand, 1969.

Davis, M. Z. Living with multiple sclerosis: A social psychological analysis. Illinois: Charles C. Thomas, 1973.

Davis, M. Z. Transition to a devalued status: The case of multiple sclerosis. University of California, 1970. Michigan: Xerox University Microfilms, microfilm-xerography, 1974.

Diers, W. C., & Brown, C. C. Psychometric patterns associated with multiple sclerosis. Archives of Neurology and Psychiatry, 1950, 63, 760-765.

Duckworth, J. C., & Duckworth, E. MMPI interpretation manual for counselors and clinicians. Indiana: Accelerated Development Inc., 1975.

Fann, W. E., & Goshen, C. E. The language of mental health. Saint Louis: C. V. Mosby, 1973.

Ferguson, G. A. Statistical analysis in psychology and education (3rd ed.). New York: McGraw-Hill, 1971.

Fink, S. L., & Houser, H. B. An investigation of physical and intellectual changes in multiple sclerosis. Archives of Physical Medicine and Rehabilitation, 1966, 47, 56-61.

Firth, D. The case of Augustus D'Esté. Cambridge: University Press, 1948.

Gilberstadt, H., & Duker, J. A handbook for clinical and actuarial MMPI interpretation. Philadelphia: W. B. Saunders, 1965.

Gilberstadt, H., & Farkas, E. Another look at MMPI profile types in multiple sclerosis. Journal of Consulting Psychology, 1961, 25, 440-444.

Gilbert, J. Clinical psychological tests in psychiatric and medical practice. Springfield, Illinois: Charles C. Thomas, 1969.

Goldstein, G., & Shelly, C. H. Neuropsychological diagnosis of multiple sclerosis in a neuropsychiatric setting. The Journal of Nervous and Mental Disease, 1974, 158(4), 280-290.

Good, P. K., & Brantner, J. P. The physician's guide to the MMPI. Toronto: Thomas Allen, 1961.

Grinker, R. R., Ham, G. C., & Robbins, F. P. Some psychodynamic factors in multiple sclerosis. In H. W. Woltman, H. H. Merritt, S. B. Wortis & C. C. Hare (Eds.), Multiple sclerosis and the demyelinating diseases. Baltimore: Williams & Wilkins Company, 1950, p. 28.

Harrower, M. R. The results of psychometric and personality tests in multiple sclerosis. In H. W. Woltman, H. H. Merritt, S. B. Wortis & C. C. Hare (Eds.), Multiple sclerosis and the demyelinating diseases. Baltimore: Williams & Wilkins Company, 1950, p. 28.

Harrower, M. R., & Kraus, J. Psychological studies on patients with multiple sclerosis. A.M.A. Archives of Neurology and Psychiatry, 1951, 66, 44-57.

Hathaway, S. R., & McKinley, J. C. Minnesota Multiphasic Personality Inventory, manual revised 1967. New York: The Psychological Corporation, 1967.

Hathaway, S. R., & Meehl, P. E. An atlas for the clinical use of the MMPI. Minneapolis: University of Minnesota Press, 1951.

Holzberg, J. D., & Alessi, S. Reliability of the shortened MMPI. Journal of Consulting Psychology, 1949, 13, 288-292.

Hunt, J., & Cofer, C. N. Psychological deficit. Personality and the Behavior Disorders, 1944, 2. New York: Ronald Press.

Jelliffe, S. E. Multiple sclerosis and psychoanalysis. The American Journal of the Medical Sciences, 1921, 161, 666-675.

Jelliffe, S. E. Emotional and psychological factors in multiple sclerosis. In C. L. Dana, S. E. Jelliffe, H. A. Riley, F. Tilney & W. Timme (Eds.), Multiple sclerosis [disseminated sclerosis]. New York: Paul B. Hoeber, 1922.

Kurtzke, J. F. On the evaluation of disability in multiple sclerosis. Reprinted from Neurology, August, 1961. July, 1965.

Lachar, D. The MMPI: Clinical assessment and automated interpretation. Los Angeles: Western Psychological Services, 1974.

Langworthy, O. R., Kolb, L. C , & Androp, S. Disturbances of behavior in patients with disseminated sclerosis. The American Journal of Psychiatry, 1941, 98, 243.

Leibowitz, U., & Alter, M. Multiple sclerosis: Clues to its cause. Amsterdam: North-Holland Publishing, 1973.

Leibowitz, U. (Ed.). Progress in multiple sclerosis research and treatment. Proceedings of an International Symposium, 12 to 13 May 1970, Jerusalem, Israel. New York: Academic Press, 1972.

Limburg, C. C. The geographic distribution of multiple sclerosis and its estimated prevalence in the United States. In H. W. Woltman, H. H. Merritt, S. B. Wortis & C. C. Hare (Eds.), Multiple sclerosis and the demyelinating diseases. Baltimore: Williams & Wilkins Company, 1950.

Matarazzo, J. D. Wechsler's measurement and appraisal of adult intelligence (5th ed.). Baltimore: Williams & Wilkins, 1972.

Matthews, C. G., Cleeland, C. S., & Hopper, C. L. Neuropsychological patterns in multiple sclerosis. Diseases of the Nervous System, 1970, 31, 161-170.

May, R. The meaning of anxiety. New York: Ronald Press Co., 1950.

McAlpine, D., Lumsden, C., & Acheson, E. D. Multiple sclerosis: A reappraisal (2nd ed.). Edinburgh: Churchill Livingstone, 1972.

Merritt, H. H. A textbook of neurology (4th ed.). Philadelphia: Lea and Fabiger, 1967.

Merritt, H. H. Multiple sclerosis: A clinical science review. Reprinted from Medical World News, July, 1970.

Millar, J. H. D. Multiple sclerosis: A disease acquired in childhood. Illinois: Charles C. Thomas, 1971.

Parsons, O. A., Stewa[illegible] K. D., & Arenberg, [illegible] Impairment of abstracting ability in multiple sclerosis. The [illegible]rnal of Nervous and Mental Disease, 1957, 125, 221.

Philippopoulos, G. S., Wittkower, E. D., & Cousineau, A. The etiologic significance of emotional factors in onset and exacerbations of multiple sclerosis. Psychosomatic Medicine, 1958, 20(6), 458-474.

Pratt, R. T. C. An investigation of the psychiatric aspects of disseminated sclerosis. Journal of Neurology, Neurosurgery and Psychiatry, 1951, 14, 326.

Reitan, R. M., Reed, J. C., & Dyken, M. L. Cognitive, psychomotor, and motor correlates of multiple sclerosis. The Journal of Nervous and Mental Disease, 1971, 153(3), 218-224.

Rosenthal, R., & Rosnow, R. L. The volunteer subject. New York: John Wiley & Sons, 1975.

Ross, A. T., & Reitan, R. M. Intellectual and affective functions in multiple sclerosis. A.M.A. Archives of Neurology and Psychiatry, 1955, 73, 663-677.

Rudd, J. L., & Margolin, R. J. Maintenance therapy in physical medicine: Relation to rehabilitation of the chronically ill. Journal of the American Geriatrics Society, 1964, 12, 19-26.

Safilios-Rothschild, C. The sociology and social psychology of disability and rehabilitation. New York: Random House, 1970.

Schwartz, M. S., & Brown, J. R. MMPI differentiation of multiple sclerosis vs. pseudoneurologic patients. Journal of Clinical Psychology, 1973, 29(4), 471-474.

Shontz, F. C. MMPI responses of patients with multiple sclerosis. Journal of Consulting Psychology, 1955, 19, 74.

Sugar, C., & Nadell, R. Mental symptoms in multiple sclerosis. The Journal of Nervous and Mental Disease, 1943, 98, 267-280.

Swank, F. L., Lersted, O., Ström, A., & Backer, J. Multiple sclerosis in rural Norway. New England Journal of Medicine, 1952, 246, 721.

Timme, W. Multiple sclerosis--historical retrospect. In H. W. Woltman, H. H. Merritt, S. B. Wortis & C. C. Hare (Eds.), Multiple sclerosis and the demyelinating diseases. Baltimore: Williams & Wilkins Company, 1950.

Underwood, B. J. Psychological research. New York: Appleton-Century-Crofts, 1957.

Wechsler, D. Manual for the Wechsler adult intelligence scale. New York: Psychological Corporation, 1955.

Wechsler, D. The measurement and appraisal of adult intelligence (4th ed.). Baltimore: Williams & Wilkins Company, 1958.

# APPENDICES

# APPENDIX A

## LETTER TO MS PATIENTS

March 15, 1976

Edmonton Chapter
Multiple Sclerosis Society of Canada

Dear Member:

At the Annual General Meeting of the Edmonton Chapter, February 1976, a discussion point regarding research was brought forward by a member from the floor. The member emphasized the importance of research and asked what could be done to encourage more studies. Prior to the Annual Meeting date, my investigations were underway to initiate a research project relating to individuals with MS. In consultation with Mrs. Edna LaForge, Executive Director of the Prairie Division Multiple Sclerosis Society, the unmet need of a counseling program for the MS patient was recognized as the top priority. Simply stated, the MS patient needs someone to talk to, someone to communicate with and someone who understands.

To establish a counseling program for individuals with MS a solid foundation from specific information is essential. In other words, some basic research into MS and how it affects the individual from a nonmedical viewpoint is necessary as a first step. In the past such research has been undertaken, but not in Alberta. It is timely that research of this nature be conducted in our province.

As a Graduate Student at the University of Alberta, I am undertaking a Masters research project to gather data which will help establish a framework from which a counseling program could be developed. Your support in volunteering to participate in this project is requested. If you come into the following categories,

(a) willing to participate and reside in the Edmonton area,
(b) diagnosed with Multiple Sclerosis by a medical doctor,
(c) MS diagnosis made within the last five (5) years, and
(d) eighteen (18) years of age or over,

then your involvement is important. A minimum of 25 adults is required.

If you volunteer, what does this commitment mean? Timewise, two or three hours at your convenience is needed during April or May of this year. During this time you will participate in the completion of some psychological measures to determine the nonmedical effects of MS on the individual. Assurance will be made that collected data will be treated in a confidential manner. If you have any questions, please contact me. If I am not available leave your name and telephone number and I will return your call as soon as possible.

If you are willing to participate in this research or just want more information, please telephone:

Denele Walsh
Department of Educational Psychology
University of Alberta
432-5864 (9:00 a.m. to 5:00 p.m.) Monday, Wednesday, and Friday, or
482-1050 Residence.

Again, this study is nonmedical in nature but this in no way decreases its importance in providing valuable information to understand and deal effectively with the disease of Multiple Sclerosis. Hoping to hear from you.

Respectfully submitted,

Denele E. Walsh

# APPENDIX B

## INTERVIEW GUIDE

# INTERVIEW GUIDE

## Personal Data

Name
Telephone Residence
Employment
Birthdate
Age
Address
Business
Sex
Birthplace

## Present Situation

Formal training or level of education
Employment status
Marital status
Daily activities
Ethnic origin
Type of family environment
Number of children
Ordinal position

## Symptoms

Age at onset of first symptoms
Duration of these first problems
Describe the first symptoms
Describe the symptoms now
Time lapse between initial symptoms and final medical diagnosis
Number of doctors seen prior to diagnosis
Who and how were you told of the diagnosis
Type of tests before diagnosis

## Degree of Disability

Ambulatory _____ Cane _____ Wheelchair _____ Others
Medication (past and present)
Who prescribed the medicine
Treatments
Special equipment
Medical problems other than MS
Mobility Problems

## Family and Friends

Other family members (blood or other) with MS
Member of MS Society of Canada (Edmonton Chapter)
Describe a typical day
Changes with family and friends
Future plans that are affected
New contacts or relationships since diagnosis
Working relationships with others

## General questions

Current, unanswered questions about MS
Opinion of the general public regarding MS
Describe your present feelings and frame of mind