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ROLE OF MINNESOTA MULTIPHASIC PERSONALITY INVENTORY IN THE DIAGNOSIS OF PSYCHIATRIC CONDITIONS

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SYNOPSIS

Psychological ill-health is as much a problem in the Republic of Singapore as in the West. Good medical history, clinical examination and psychiatric interview are the mainstay of psychiatric diagnosis. Nevertheless, psychometry has an important place in the evaluation of psychiatric conditions. Among the self-report inventories the Minnesota Multiphasic Personality Inventory is the most widely used psychological test which has been translated into fifteen languages including Mandarin. Its mode of administration and interpretation is described and discussed.

Results of the survey carried out on a random sample of this University students from the English stream revealed that their personality profile was very similar to that of college students in California. A few psychiatric histories of cases seen in our practice together with corresponding MMPI profiles are reproduced to demonstrate that the modified English version of the test can be used on the English educated patients in Singapore.

INTRODUCTION

An estimate based on findings in general practice in Great Britain revealed that one-tenth to one-fifth of the total population was mentally ill or emotionally disturbed (Shephered *et al*, 1966). Koh (1969) after a study of emotional disorders in his general practice in the Republic of Singapore was of the opinion that the morbidity rates in the urbanised parts of South East Asia were very similar to those in the West. The hospital services deal with only a small fraction of patients with these conditions and the great majority are either treated in the community or remain untreated. Besides, only a minority of patients with emotional disorders present exclusively with psychiatric symptoms (Kessel, 1960). Most of them have somatic complaints which may obscure the underlying emotional disturbance (Balint, 1965). In a study carried out in general practices by Goldberg and Blackwell (1970) it was reported that even if the doctor is strongly motivated and has received expert psychiatric training accurate diagnosis may prove difficult. Doctors would therefore welcome more informed guidance in the detection and management of these disorders. That is why the Royal Commission on Medical Education (1965-1968 Report Cmnd. 3569, London, H.M.S.O., 1968) recommended greater emphasis on the psychological and social aspects of medicine. In a report of the British Medical Association's Planning Unit (1970) the primary or general practices are recommended to expand their interests to social and psychological frames of reference.

A good deal of emphasis has always been placed on correct psychological evaluation of medical conditions encountered in the student health practice of this University. For this, besides the medical interviews we have had to lean on results of the psychological tests, knowing full well that application of tests designed and standardised in the west to individuals born and brought up in Asian cultures was open to certain criticism. But until such time when new tests are formulated and standardised on indigenous samples, one has no choice but to make use of them, provided of course they are carefully selected and modified, if necessary, to make them as suitable as possible for local requirements. The purpose of this paper is to describe and discuss in brief the Minnesota Multiphasic Personality Inventory (MMPI), and to illustrate with examples its utility as a diagnostic procedure on students from the English stream of education in our medical practice.

WHAT IS MMPI?

Personality tests can be divided into three main categories: self-report inventories, performance or situational tests and projective techniques. Among the self-report inventories in which an individual is asked to answer about himself to standard written queries, the Minnesota Multiphasic Personality Inventory can be considered to

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hold the place of pride. It is the most widely used self-report personality inventory which has now been translated into fifteen languages (Dahlstrom and Welsh, 1960). Since 1940 when it was first designed and validated in the University of Minnesota, tremendous amount of effort has been devoted to research in its application not only in America but also in other European and Asian countries. The test has acquired a well-established place in such diverse fields as psychiatry, internal medicine, counselling, industry and research (Good and Brantner, 1961).

The MMPI may be considered to be a form of psychiatric examination, for the questions contained in it are similar to those generally asked in a psychiatric interview. It has even an advantage over a psychiatric interview in that the data obtained from its responses is free from biases of interviewer or test interpreter. Moreover, as the queries are in a standardised form, the profiles produced by it are helpful in measuring the actual extent of deviation of personalities from the normal.

The Minnesota Multiphasic Personality Inventory or MMPI as it is popularly known, consists of at least 566 positive statements pertaining to various aspects of human personality. The MMPI items touch upon such diverse areas as general health, psychosomatic symptoms, neurological disorders; habit patterns; family and marital problems, occupational and educational interests; sexual, religious and social attitudes; and symptoms of various psychiatric disorders (Hathaway and Mckinley, 1951).

ADMINISTRATION AND PLOTTING OF PROFILE

There are two standard methods of administering the test, the individual card method and the group booklet form. Both methods have the same statements or questions and are equally easy to administer. In the former procedure the subject is asked to sort out the cards with the positive statements printed on them into three categories: True, False or Cannot Say. But the individual is advised to avoid as far as possible the category Cannot Say, for the cards belonging to it are eliminated from the actual process of scoring the personality profile. The group form of the MMPI is meant for groups but it can also be applied to individuals. Here the items on the cards in the individual forms are presented in a booklet form. The subject is also given a separate answer sheet and is asked to blacken between the lines against a response in the column of True or False. It takes about 60 to 90 minutes to complete the inventory. No time limits are imposed, but the person is advised to score rapidly without prolonged deliberations. This booklet form of method routinely adopted in our studies has an advantage over the individual card method, because it facilitates rapid scoring by a computer or hand with the aid of special scoring keys or templates. The answer sheets with 20 or more blanks are considered incomplete and invalid for the purpose of scoring a profile.

As 566 variables of emotion and behaviour are too many to handle effectively, the statements or items as they are commonly called are grouped into scales for scoring purposes. But before the final profile is plotted in the form of a graph which consists of three validity (L, F, K) scales, ten clinical scales shown in Table II and ego-strength (Es) scale, original raw scores are modified in two stages. The first stage which involves addition of what is known as K factor to five clinical Scales (Hs, Pd, Pt, Sc and Ma) with the aid of a specially designed table is to improve their validity and increase their discriminatory powers. In the second stage all validity and clinical scales are modified with the assistance of another set of specially formulated table. These final modified scores also known as T scores are meant to give more objectivity to the test and to facilitate comparisons between people easier (Good and Brantner, 1961).

For the sake of maintaining its validity in Asian cultures a few questions in the inventory were modified. Moreover, before we started administering the inventory for diagnostic purposes a survey on a cohort of the University of Singapore students was carried out. Our findings as shown in Table I indicate that the average personality profile of the English educated students was very similar to that of college students in California, (Kadri, 1971). This could be attributed partly to internalization of western cultural norms by our University going population in a modern Asian city and partly to common knowledge of socially desirable answers, rather than "real" behavioural similarity. Fig. 1 presents the mean MMPI profiles of two normal groups of our University's male and female students who received their entire pre-university education in the English stream. The graph shows that the composite scores of both males as well as females on all scales but two ranged from 50 to 60. The two exceptions being Scale Sc (8) on which the boys recorded a mean score of 63 and Scale Pa (6) on which the girls registered a mean low score of 46. The other striking feature was that on all the clinical scales males scored higher than females.

INTERPRETATION OF THREE VALIDITY SCALES

Before one starts interpreting the clinical scales the problem of validity has to be looked into. For

TABLE I

MEAN STANDARD SCORES ON MMPI SCALES

	University of Singapore Students				California College Students (1954)			
	Men (n = 200)		Women (n = 60)		Men (n = 707)		Women (n = 763)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
L	53·92	8·22	52·96	7·73	—	—	—	—
F	57·34	8·68	57·22	8·81	—	—	—	—
K	55·46	8·73	52·07	7·40	—	—	—	—
1 Hs*	52·54	9·18	49·31	7·02	52·54	8·25	49·69	5·91
2 D	59·98	12·41	56·84	9·76	53·05	9·96	49·69	8·01
3 Hy	57·26	8·92	52·47	9·32	56·26	7·68	54·46	7·20
4 Pd*	55·07	12·04	54·04	12·14	55·90	9·99	54·67	8·73
5 Mf	59·54	8·86	53·00	8·80	58·03	11·61	49·54	9·33
6 Pa	54·31	9·66	46·02	8·42	51·22	7·59	52·72	7·41
7 Pt*	53·15	10·37	53·78	10·50	54·55	9·27	53·17	7·41
8 Sc*	55·10	10·75	55·65	10·45	55·45	9·27	53·98	7·11
9 Ma*	57·75	10·29	56·38	11·44	56·59	10·14	54·07	9·72
0 Si	53·15	8·70	59·78	9·69	—	—	—	—
Es	52·58	9·81	50·89	8·35	—	—	—	—

*Without K corrections.

TABLE II

INTERPRETATION OF THE TEN CLINICAL SCALES OF THE MMPI

Scale Number	Scale Name	Clinical Expression	Normal Expression
1	Hs	Hypochondriasis	Tired; inactive; lethargic; feels physically ill
2	D	Depression	Serious; low in morale; unhappy; self-dissatisfied
3	Hy	Hysteria	Idealistic; naive: articulate; ill under stress; social
4	Pd	Psychopathic deviation	Rebellious; cynical; disregards rules; socially aggressive; selfish
5	Mf	Interest pattern of the opposite sex	High score: sensitive. Low score: exaggerated own sex interest pattern. High score in males: gentlemanly; scholarly; feminine. High score in females; rough; ambitious
6	Pa	Paranoia	Perfectionistic; stubborn; hard to know; or, with moderate scores, socially acceptable
7	Pt	Psychasthenia	Dependent; desires to please; feelings of inferiority; indecisive, anxious
8	Sc	Schizophrenia	Negative; difficult; odd; apathetic; lacks social grace
9	Ma	Hypomania	Expansive; optimistic; decisive; not bound by custom
0	Si	Social introversion	Unassertive; self-conscious; shy; or with low score, socially active

it is vital to know whether the subject understood the implications of the questions and whether he was in a co-operative frame of mind, or careless or reluctant to give frank answers. Validity Scales (L, F, K) throw light on the possibility of faking on the part of the subject, and as to whether he was trying to give deliberately favourable or unfavourable picture of himself. Generally speaking, deviations above the score of 70 are considered abnormal. An L score above 70 usually indicates that the individual has purposely suppressed or misinterpreted the statements. The scores of 70 or above on F scale means that the person did not appreciate the questions properly or deliberately gave inaccurate answers. However, at times, even schizoid and depressed patients are liable to produce high F scores. K scale is generally regarded as a subtle measure of test taking attitudes. High K scores represent defensiveness against psychological weakness. The K scale is also related to socio-economic status and amount of education. There are other interpretations of usually high or low K scores, but their explanation is beyond the scope of this paper.

INTERPRETATION OF CLINICAL PROFILE

In Table II are listed the ten clinical scales that are basic for the use of the MMPI (Hathaway and Monachesi, 1963). The descriptions in the list suggest some of the common traits associated with high scores for each scale and also low score on Mf scale. There is considerable evidence to suggest that in general, the greater the number and magnitude of deviant scores i.e. T scores above 70, the more likely it is that the individual is severely disturbed (Anastasi, 1961). Nevertheless, the test manual (Hathaway and McKinley, 1951) warns against literal interpretation of the clinical scales.

For instance, one cannot assume that a high score on the schizophrenic or Sc (8) scale automatically means the presence of schizophrenia. Other psychotic groups also show high elevations on this scale and schizophrenics often score high on other scales. Moreover, such a score may occur in a normal person. When assessing an average drawn or coded profile, it is better to attend to the several highest points than to the absolute standing of any one scale. The significance of very low scores in the first nine clinical scales is not yet fully understood and remains the subject of further research.

In interpreting the profiles for clinical psychiatric conditions or components of personality all the clinical scales except Si (0) and Es are recorded in a descending order. The development of coding in the form of combination of two, three or four highest scales has helped in directing attention away from raised individual scales and their sometimes misleading psychiatric labels. The method of interpreting a profile through grouping of highest scales has also helped in the study of persons with similar codes to find common personality traits.

Persons with high Si (0) scores have been described as shy, sensitive, reticent and introverted; whereas those with low scores on this scale are considered sociable, enthusiastic, active and extroverted (Good and Barntner, 1961). The results of our survey in the University depicted in Fig. 1 revealed that the mean female score on this scale was significantly higher than the mean score of the males. The finding confirms the view that in all South East Asian cultures girls tend to be quieter, more shy, reserved and introverted than boys. The ego-strength (Es) scale correlates positively with vitality, drive, self-confidence, breadth of interest and intellectual efficiency. On the other hand, low scores on this scale are indicative of feelings of inferiority, moodiness, worrisomeness, chronic fatigue and irrational fears. According to Good and Brantner, the Es scale provides some information about current integration of the personality and might be helpful in diagnosing schizophrenia in conjunction with Scales Sc (8) and Si (0).

Following are the brief illustrative case histories of various psychiatric conditions encountered in our medical practice and their MMPI profiles. All the cases reported here were referred to consultant psychiatrists whose diagnostic labels corresponded with our MMPI findings.

Case 1

Anxiety Neurosis. 24 Years. Tamil Male. Medical Student

SYMPTOMS

Bi-temporal headaches, difficulty in concentration on studies, insomnia, fatigue, and feelings of inferiority off and on for several months.

MMPI (Fig. 2)

Scores on (L, F, K) scales well below 70 mark indicate that the profile is quite valid. Abnormally high scores are found in clinical Scales 2-7-3-1 in their descending order. Generally speaking, inverted V shaped profile on Scales 1-2-3 is known as "Neurotic triad". Significantly low score recorded on ego strength (Es) scale is indicative of diminished confidence, lack of drive and worrisomeness. The high score of 80 on Scale Pt (7) in this case suggests psychasthenic tendency in the form of indecisiveness, lack of confidence, inability to concentrate,

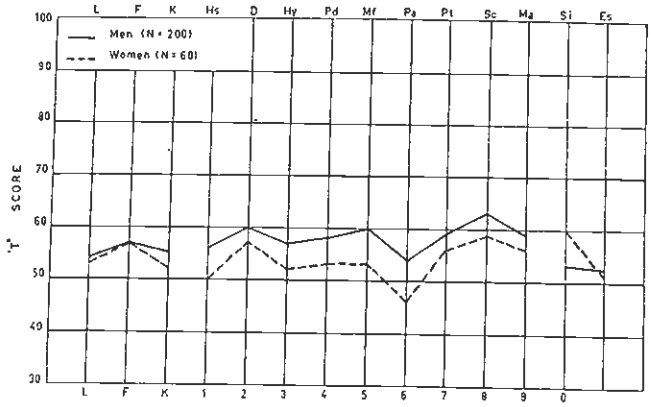

Fig. 1. Mean MMPI profiles of two normal groups of male and female Singapore University students (with K corrections).

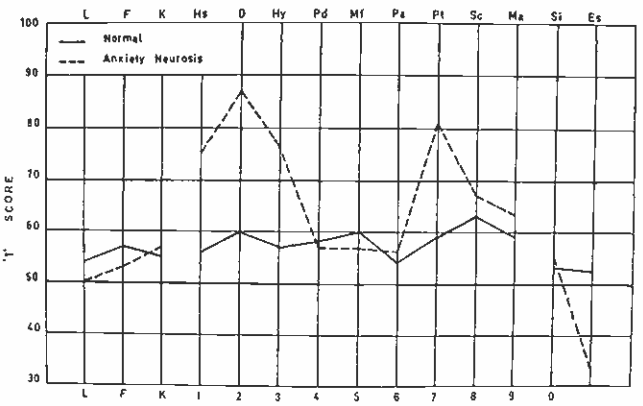

Fig. 2. Mean MMPI profiles of a group of normal males and a case of anxiety neurosis.

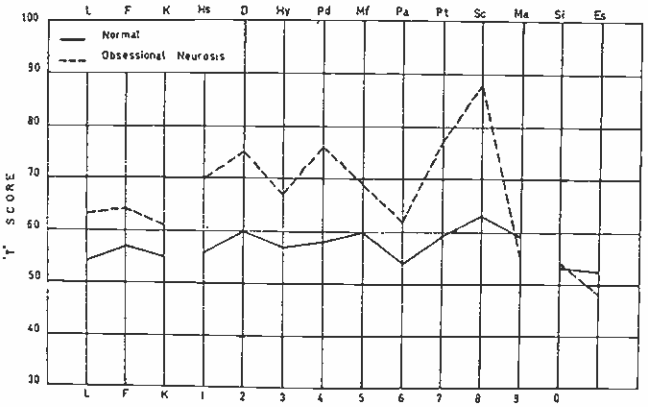

Fig. 3. Mean MMPI profiles of a group of normal males and a case of obsessional neurosis.

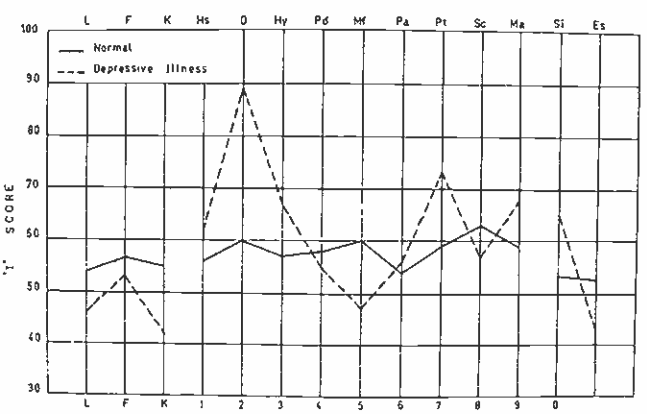

Fig. 4. Mean MMPI profiles of a group of normal males and a case of depressive illness.

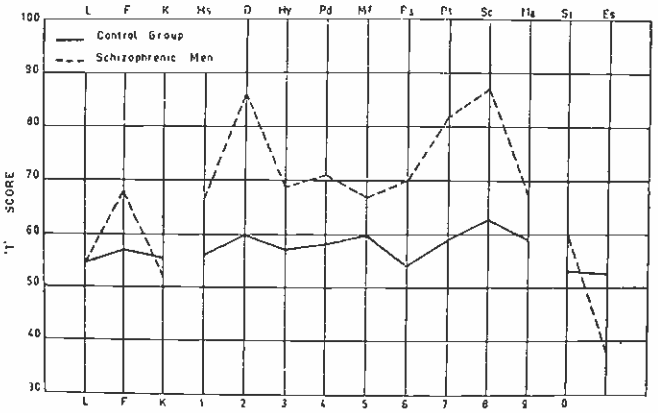

Fig. 5. Profiles of MMPI mean scores of control group and schizophrenic men.

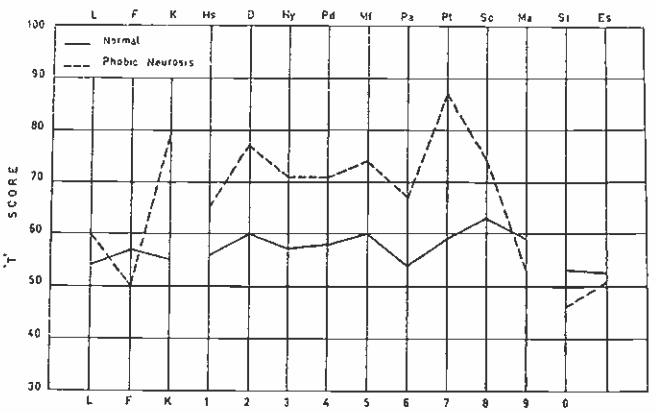

Fig. 6. Mean MMPI profiles of a group of normal males and a case of phobic neurosis.

fatigue and phobias. On the other hand, patients with scores higher than 70 are often schizoid, and their obsessions or compulsions are irrational.

He graduated after a delay of two years.

Case 2

Obsessional Neurosis. 20 Years. Chinese Male. Science Student

SYMPTOMS

Shivering or involuntary shaking of legs off and on for previous eighteen months. Feeling warm in head and on face. Also feeling as if he could not open or close his mouth. Vague retrosternal and upper abdominal pains. Inability to concentrate on studies. Frequent headaches. Tiredness. He had compulsive drive towards perfectionism and repetitive checking in order to reassure himself. He also harboured some irrational fears.

MMPI (Fig. 3)

Scales (L, F, K) are well below 70 mark and therefore the profile is considered valid. High codings in their descending order are seen on Scales 8-7-4-2. Individually raised Pt (7) scale measures phobias and obsessive-compulsive behaviour. However, in conjunction with very high Sc (8) scores such profiles are about evenly split between neurosis and psychosis. Although the student had lot of psychosomatic complaints, his score on Hs (1) scale was surprisingly not very high. Young psychiatric patients with 8-7 codes as recorded here are described as irritable, apathetic and nervous.

He passed regularly and achieved Class II (Lower) honours degree.

Case 3

Depressive Illness. 21 Years. Chinese Male. Science Student

SYMPTOMS

Vague chest pains and epigastric discomfort off and on for several months. Occasional attacks of diarrhoea and dyspepsia, loss of appetite. Drowsiness. Inability to concentrate on studies. Feeling depressed and tensed up. Weakness and tiredness. History of worrisomeness running in family.

MMPI (Fig. 4)

The validity Scales (L, F, K) are within normal limits. High scores recorded in descending order in Scales 2-7-9-3. Note high Si (0) scale and low Es scale. The code Group 2-7 is common among patients suffering from either reactive or endogenous depression. Raised Ma (9) in depression is unusual. In this case, perhaps it is suggestive of underlying manic-depressive personality.

Inspite of psychiatric treatment the student repeated his final year; but as his academic performance even at the second attempt was substandard he was refused re-admission and dropped out.

Case 4

Schizophrenia. 20 Years. Chinese Male. Science Student

SYMPTOMS

History of persistent occipital headaches and vague pains along left forearm. Ideas of reference, "my sister is trying to influence me." According to the history obtained from parents, he used to be in tears off and on without any rhyme or reason. At home his behaviour was very restless and agitated. At times, he was found staring at the ceiling and muttering to himself for long periods. On psychiatric examination he was also found to have thought disorder.

MMPI (Fig. 5)

This figure presents the average profile of six confirmed cases of schizophrenia, inclusive of this student, seen in our practice. The validity Scales (L, F, K) are within normal limits and scores on Scales 8-2-7 are abnormally high. Our findings confirm the view held by Dahlstrom and Welsh (1960), that many psychotic profiles show high points in Scales 6-7-8-9 as well as in scales of the "Neurotic triad" 1-2-3. Such patterns of raised scales in 6-7-8-9 have been designated by them as the "Psychotic tatrads". Raised Si (0) which means highly introverted personality pattern and low ego strength (Es) shown in the prc file are expected in all proven untreated cases of schizophrenia.

The student's condition deteriorated inspite of all forms of treatment and he was obliged to withdraw from the course.

Case 5

Phobic Neurosis. 22 Years. Chinese Male. Pre-Clinical Medical Student

SYMPTOMS

Inability to concentrate on studies, nervousness, weakness, feeling depressed, headaches, complained of continuous high pitched whining sound in the right ear for two years and undue anxiety which increased within previous two months. "I am jittery nowdays for no apparent reason or for a reason of trivial nature. Will I turn deaf? Have I got oto-sclerosis? These thoughts creep again and again. Do I have a diseased mind?" He was examined by a neurologist and organic pathology excluded.

MMPI (Fig. 6)

Inspite of elevated K scale the profile is considered valid. In this case, high K score represents defensiveness against psychological weakness. The descending order of elevated scales is 7-2-8-3. Individually Scale 7 is supposed to measure phobias, compulsive behaviour and anxiety reaction. Persons with this combination of high coding are usually miserable with their symptoms, and occasionally they may be unable to carry on their ordinary occupations e.g. study in this case.

Inspite of this psychic disability he graduated M.B., B.S. without any delay in his medical career.

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