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MMPI ITEM COMPREHENSION IN CRIMINAL OFFENDERS

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This is presented to the School of
Graduate Studies of the University
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of the requirements for the degree of
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CURRICULUM STUDIORUM

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ABSTRACT

MMPI ITEM COMPREHENSION IN CRIMINAL OFFENDERS

It has been suggested that poor reading comprehension skills may adversely affect an individual's ability to fully understand some items on the Minnesota Multiphasic Personality Inventory (MMPI), and hence distort the resulting profile from which important clinical decisions may be made. This issue is of particular importance to the corrections field since it is believed that there is a high incidence of poor readers among inmate populations. The aim of the present study was to: (1) Discover to what extent comprehension of the MMPI items is related to performance on the MMPI and (2) Determine how comprehension is related to clinical judgements based on offenders' MMPI profiles. In Study 1, a sample of 60 male criminal offenders were administered the MMPI, the Wide Range Achievement Test (WRAT; Reading), the Quick Test and an MMPI Item Comprehension Test (ICT; a verbal comprehension test comprised of items drawn from the MMPI itself). Demographic information (age, education, socioeconomic status) was also collected.

Multiple regression analyses of MMPI scales using ICT subtests as predictors revealed that these comprehension variables accounted for between 4 - 29% of the variance in raw scores. When the WRAT and I.Q. scores and the demographic variables were included in the regression analyses, between

11 - 37% of the variance of the MMPI scales could be accounted for. In Study 1, three clinicians with backgrounds in corrections rated the subjects' MMPI profiles in terms of validity, pathology and need for referral. In general, these ratings did not differentially reflect good vs. poor comprehension as defined by differences in ICT subtest scores. Thus, although there was evidence to indicate that comprehension and demographic factors are related to performance on the MMPI, the clinical significance of these effects requires further investigation in future research.

CHAPTER I

REVIEW OF THE LITERATURE

The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943) is the most widely used personality test in a variety of clinical settings (Brown & McGuire, 1976). In particular, it is employed extensively in criminal justice settings in the United States (Gearing, 1979) and Canada (Gendreau, 1975). For example, the MMPI is utilized for diagnostic classification and treatment purposes (Megargee & Bohn, 1979); as a predictor of various behaviours within correctional and community settings (e.g. Pantou, 1973; Smith & Lanyon, 1968); and as an outcome measure for program evaluation (e.g. Jacobson & Wirt, 1969). In addition, the MMPI is often the test of choice in the investigation of various theoretical models of criminal behaviour (e.g. Hare, 1970; Platt & Labate, 1976) and many of the test items form the basis for the development of specialized scales employed in criminal justice research (e.g. Gendreau, Leipziger, Grant & Collins, 1979).

However, while its use is widespread, the value of employing the MMPI for purposes such as those noted above, is in part dependent upon several issues pertaining to the test's methodological adequacy in its application to offender populations (cf. Gearing, 1979). Some of these

issues, as noted by Gearing (1979), include protocol validity and interpretation, dissimulation, use of base rates for prediction, the influence of variables such as age, sex, race, timing of administration and the use of short forms. A very important question that is of particular interest to this study focuses on two basic points: (1) How well do offenders actually comprehend the MMPI items and (2) What effect, if any, does this have on MMPI profiles.

While Dahlstrom, Welsh and Dahlstrom (1972) have recommended the use of brief intellectual and reading assessment measures to identify subjects who may have difficulty completing the MMPI, this suggestion has been largely ignored in research with offenders. Confirming this fact is that Gearing (1979) found less than 10% of the recent MMPI offender studies he reviewed provided screening in this. He stated (p. 937) that it is thought that "there is a significant incidence of illiterate... inmates in prison in general." Illiteracy aside, it can be said with some degree of certainty that a substantial majority of offenders (even in relatively wealthy areas with few minority groups, such as in Ontario) have little education, few work skills, and come from families of very low socioeconomic status (cf. Gendreau, Madden & Leipziger, 1979). There is also a growing body of literature in the correctional field attesting to the fact that a considerable incidence of reading disabilities

exists among various correctional samples (Ross, 1977).

In addition, a popular criticism of contemporary education practices is that reading and writing abilities have declined considerably among the youth of today, presumably as a result of a decline in the quality of primary and secondary education.

Comprehension/Readability

There is a small body of MMPI literature, largely ignored, that reinforces some of the aforementioned points. As far back as 1953, Hanes assessed the reading grade difficulty of the MMPI and attempted to test the hypothesis that the MMPI does not necessarily communicate identical information to subjects of limited reading ability. Two hundred subjects from the Ohio Penitentiary were given the Ohio Silent Reading Test and two weeks later, the MMPI. Using two separate formulæ, the reading grade difficulty of the MMPI was found to be at the third grade. Results indicated that 30% of the subjects read below this level. In addition, three questions from the MMPI were selected and five subjects from each of the reading grades (2 - 16) were asked to define them. Results showed that 17% of the questions were given incorrect meanings, 20% were obviously not understood, 28% were essential repetitions of the sample question and 34% were correct definitions. Hanes (1953) also noted that subjects with lower reading ability presented a greater lack

of comprehension. The author concluded that "although the MMPI is one of the most readable of the available tests, the questions are sensitive to numerous interpretations by a variety of subjects where limited education is a real factor" (Hanes, 1953; p. 85). Hanes, however, did not provide any suggestions as to how the MMPI would be affected by poor comprehension of the items.

Johnson and Bond (1950) assessed the readability level of the MMPI using Flesch's (1948) formula, which is based on the number of syllables per hundred words and the average sentence length of the items. If the test is assigned a reading ease (RE) level of 0, it is virtually unreadable whereas if the RE level is 100, it is supposed that a fourth grade child can answer about 75% of the test questions. An application of this formula to a sample of MMPI material yielded a reading ease score of 88 and grade 6 reading level. The authors caution, however, that the Flesch formula may not measure two important factors affecting readability - the effect of the complexity produced by double negatives and the conceptual level of the items. The authors concluded that the "reading level of the MMPI ... appears to be well adapted to most of the general population and to most junior high school groups. However, the variability in reading ability in these groups would indicate that even this test would not adequately measure clients in the lower end of the reading distribution" (Johnson & Bond, 1950; p. 323).

Harris and Baxter (1965) studied ambiguity in the MMPI and noted that certain items were often difficult to interpret with respect to time, condition, circumstance or vagueness of wording of the statements. Results of their study showed that 15% of the test items were perceived as ambiguous to some degree by half of their sample. It must be stressed, however, that the sample was comprised of first year university students who presumably have good reading skills.

More recently, Ward and Ward (1980) have reported that a higher level of reading comprehension should be required of persons taking the MMPI than that proposed by Johnson and Bond in 1950. They recommended a reading level of grade 7 or more since their " results suggest that some MMPI scales have a Grade Level (GL) in excess of 7 " (Ward & Ward, 1980; p.388) as calculated by using Flesch's (1948) formula. In the Wards' data, the K scale received a GL of 7.2 but GL's in excess of 7 were not reported for other scales.

On the basis of these varied practices and observations, existing guidelines as to who can adequately complete the MMPI appear to be rather liberal. For example, they range from those of Glenn (1949) who stated that subjects with an I.Q. of at least 65 who had achieved a minimum of 3 years of schooling can complete the MMPI (oral administration) to those of Hathaway and McKinley (1967), the originators of the test, who suggested that subjects 16 years of age or

older with 6 years of successful schooling can be expected to complete the MMPI without difficulty, and Ward and Ward (1980) who advocate a requirement of at least grade 7.

Implications:

The lack of agreement with respect to the minimum requirement for adequate comprehension of the MMPI has important practical implications. These include a growing uncertainty as to the adequacy of pre-test assessments of offenders' reading/comprehension abilities with respect to the MMPI, as well as some doubt regarding the documentation of other variables such as education, intellectual level and socioeconomic status. In fact, there is some question as to the actual existence of pre-test assessments.

Other variables such as education, intellectual level and socioeconomic status have been shown to correlate with MMPI scales (cf. Dahlstrom and Welsh, 1960). There is evidence from a research area tangentially related to this study which suggests that poorly educated people from low socioeconomic backgrounds may produce more "pathological" MMPI profiles than people with higher education levels and socioeconomic status. Davis and Jones (1974) assessed race-related differences in MMPI profiles of schizophrenic and non-schizophrenic black and white psychiatric patients and found that poorly educated subjects of both races scored significantly higher on the Sc scale (78.30 vs. 70.49; $p < .05$) than subjects with higher education (greater than Gr.12). Subsequently, in a follow-

up study, Cowan, Watkins and Davis (1975) reported that although factors related to cultural background exert a significant influence, much of the reported variation in blacks' MMPI's may be a function of education, since the MMPI appears to retain adequate discriminative power for blacks with at least 12 years of education.

These two studies are important in that they underline the potential dangers of administering the MMPI to poorly educated people from low socioeconomic backgrounds without first ascertaining that they are able to comprehend the items well enough to answer them appropriately. This caution would definitely apply to offender populations.

In discussing the issue of MMPI comprehension, the term itself may be operationally defined in several ways. For example, there are a large number of items containing words for which poorly educated individuals may not know the meaning (e.g. brood, nausea; Glenn (1949). Understanding of MMPI items may also be adversely affected by the length of some of the items, which may confuse persons with limited reading skills. In addition, Dahlstrom and Welsh (1960) noted that the introduction of negative terms into MMPI items have posed repeated problems for some testees. In these items, the answer "False" introduces a double negative that might be confusing to some people. Very often the individual is not

sure what he is admitting or denying about himself. Dahlstrom and Welsh (1960) also noted that the use of colloquialisms and departures from strict grammatical construction have not always been helpful. The authors pointed to items containing double negatives and colloquialisms as potential problem areas but did not explain what effect these might have on MMPI profiles.

Rationale

The major focus of the present study (Study 1) was to investigate the performance of an inmate population on a test of readability/comprehension composed of items selected from the MMPI. The items were chosen on the basis of their representing potential sources of difficulty with which offenders would be faced when taking the MMPI. The items fall into the following categories: difficult words, long sentences, double negatives and colloquial expressions.

The degree to which the comprehension of these items was correlated with variables having external validity for reading comprehension (i.e. reading ability, education, I.Q.) and with the demographic characteristics of the sample (age and socioeconomic status) was determined. Secondly, the extent to which each of these variables was correlated with scores on the validity and clinical scales

of the MMPI was assessed. Thirdly, the extent to which the combined influence of these variables considered together was able to predict elevations in each of the MMPI scales was also determined. Fourthly, a measure of the effects of comprehension on the differential validity of the MMPI was provided by examining the influence of high and low comprehension on MMPI scale inter-correlations.

A secondary focus of the study (Study II) was to provide a preliminary assessment of the clinical significance of these factors. Clinicians within the corrections field were asked to classify the MMPI profiles according to three criteria: validity, degree of psychopathology demonstrated, and need for referral. Their classification decisions were then related to the ability of subjects to comprehend the MMPI.

Hypotheses

Five hypotheses were tested in the present study. Expressed in the null form, these hypotheses are:

- (1) There will be no significant individual correlations between measures of MMPI item comprehension, reading ability, grade level, age or socioeconomic status with MMPI scale scores.
- (2) The combined influence of MMPI item comprehension, reading ability, grade level, age and socioeconomic status will bear no significant relationship to MMPI scale.

scores.

(3) High vs. low scoring subjects on the ICT will not perform differentially on any MMPI scale.

(4) Correlations between MMPI scales will not differ between subjects scoring high and low on the ICT.

(5) ~~Comprehension~~ of the MMPI will not be related to clinicians' judgements of MMPI profile validity; clinical decisions regarding the severity of psychopathology or need for subsequent referral that are made on the basis of the MMPI profiles.

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CHAPTER II

STUDY I

Method

Subjects. All subjects were male offenders incarcerated at the Ottawa-Carleton Detention Centre (OCDC). This maximum security institution is operated by the Ontario Ministry of Correctional Services and receives all offenders convicted of criminal offences within the metropolitan Ottawa area, as well as persons awaiting trial. After individuals are sentenced, they are: (1) transferred to maximum security federal penitentiaries (for sentences exceeding two years); (2) transferred to Ontario correctional facilities (for sentences shorter than two years or (3) held at OCDC if the sentence is fairly short or if the offender is eligible for a community rehabilitation program in Ottawa.

Subjects were selected from a daily list of offenders who had recently been sentenced to a minimum of 30 days in prison. As it was generally feasible to test only two subjects per day, two individuals were chosen at random from a list that varied in length each day.

The means and standard deviations of selected test data and demographic variables obtained from the subjects were as follows: age (22.75; 7.56); socioeconomic status as defined by Blishen's (1976) Canadian Occupation Index

(34.04; 4.12)¹; I.Q. as defined by the Quick Test (Ammons & Ammons, 1962a, b) (93.50;10.00); reported grade level (10.27; 1.72).

A frequency count of the type of offences committed revealed that of the 60 inmates tested, 38 (63.3%) had committed crimes against property (e.g. theft, breaking and entering); 14 (23.3%) had committed liquor and drug offences (e.g. drunkenness, trafficking); 10 (6%) had committed crimes against persons (e.g. rape, attempted murder) and 2 (3.3%) had committed crimes against public order (e.g. refusing to pay alimony). A frequency count of previous offences revealed that 26 (43.3%) inmates had committed more than two previous offences; 19 (31.7%) had committed between one and two offences in the past and 15 (25%) had committed no previous offences. The length of an offender's sentence ranged from one month to 24 months with a mean of 5.94 months and a standard deviation of 5.67.

Test Materials. The Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943) is made up of statements covering a wide range of subject matter. The client is asked to respond to each statement by answering True or False or by leaving the statement blank. The

¹ A score of 34.04 on Blishen's index would be comparable to that of a mechanic, hospital orderly or longshoreman.

MMPI consists of four validity scales (V, L, F, K) and ten clinical scales (Hs, D, Hy, Pd, Mf, Pa, Pt, Sc, Ma, Si). The short form of Form-R of the MMPI was administered to all subjects.

The Reading test from the Wide Range Achievement Test (WRAT; Jastak & Jastak, 1936; rev. 1946, 1965) was administered to all subjects in order to determine reading level. The WRAT was devised as a convenient tool for the study of school subjects, such as reading (word recognition and pronunciation), written spelling and arithmetic computation. In the 1965 edition, each subtest is divided into two levels, I and II, where Level I is designed for use with children between the ages of 5 years, 0 months and 11 years, 11 months and Level II is intended for individuals from 12 years, 0 months to adulthood. The WRAT Reading test consists of words ordered in varying degrees of difficulty (i.e. length, conceptual complexity, spelling complexity) from easy (e.g. milk) to very difficult (e.g. synecdoche). Subjects are asked to read the words aloud and scores are tabulated on the basis of the number of correct pronunciations. Raw scores are then transformed into standard reading grade level scores (e.g. Level I score of 68 = Reading grade level of 5.7. (See Appendix A for WRAT).

The Quick Test (QT) is a brief, easily administrable

I.Q. test developed by Ammons and Ammons (1962a, 1962b). The QT requires an indication of recognition of the meaning of vocabulary items on a set of cards, each of which contains four pictorial representations. The subject is asked to indicate which picture best represents a word read aloud by the tester (See Appendix B). The QT has been found to correlate highly ($r = .774$ with FSIQ) with the Wechsler Adult Intelligence Scale (WAIS), particularly with the WAIS Verbal I.Q. ($r = .836$); Davis & Dizzone, 1970). It has been applied in a wide variety of settings such as prisons, institutions for the retarded and with aged persons (Carlisle, 1965; Gendreau, Wormith, Kennedy and Wass, 1975; Gendreau, Roach and Gendreau, 1973). In a study designed to establish norms and validities for use of the QT with delinquent samples, Gendreau et al. (1975) concluded that the QT yielded significant concurrent validity coefficients with a variety of tests used to assess intellectual ability (e.g. WAIS, Beta, Otis). Furthermore, the authors noted that the QT was a brief and useful I.Q. screening device and that " its validities were as adequate as any other 'brief form' I.Q. measure (p. 1203).

Comprehension Test. The MMPI Item Comprehension Test (ICT) is an experimental tool devised expressly for the present study. The ICT consists of four different sections that

are scored separately.

Part I of the ICT is the vocabulary subtest (Voc.) consisting of 40 words selected from amongst the first 399 items of the MMPI (Form-R). These items were chosen because they contained words that persons with poor reading abilities might consider difficult. The criteria for assessing word difficulty were based on information derived from three indices of word frequency (Thorndike & Lorge, 1944; Kucera & Francis, 1967; Carroll, 1971). These indices assess word difficulty by computing how many times a word appears per one million (Thorndike & Lorge, 1944; Kucera & Francis, 1967) and/or per five million words (Carroll, 1971) in various types of English language texts (e.g. newspapers, magazines, learned scientific writings, novels etc.).

An initial selection for Part I was made on the basis of the Thorndike-Lorge Word Book (1944), but the final selection was based on Carroll's index (1971) which is the most recent measure of word frequency in the English language. A preliminary list of words (90) from the MMPI was chosen on the basis of their apparent difficulty. The frequency of occurrence was then found for each word. Following this, words with a frequency greater than 25 per 5 million were arbitrarily discarded. The remaining 40

words were used to make up Part I (Vocab.) of the ICT.

In addition to a count per five million, Carroll provides a count per one million words and lists how many times a word occurred in texts meant for different grade levels. For example, the word "vulgar" received the following frequency count:

<u>Per 5 mil. wds.</u>	<u>Per 1 mil. wds.</u>	<u>Texts for grades:</u>						
		<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
5	0.56	0	0	0	0	2	1	2

(See Appendix C for similar counts of all words in Part I).

The items containing words selected for Part I were reproduced verbatim with the only change being that the "vocabulary" word was underlined (e.g. "People say insulting and vulgar things about me" ; See Appendix D for Part I).

Part II, the double negatives (DN) subtest, is made up of 25 items selected at random from a list of 70 double negative items i.e. those items for which the answer False introduces a double negative. For example, in Item 167:

"It wouldn't make me nervous if members of my family got into trouble with the law", the subject would have to answer False if he wished to indicate that such a state of affairs would indeed make him nervous. These 25 items were transformed in such a way that they would convey a positive meaning. For example, Item 167 was changed to: "It would bother me if members of my family got into

trouble with the law." (See Appendix E).

The third subtest, Long Sentences (Lg.Sent.) is comprised of 15 items chosen at random from a list of 45 items. The criterion for length was: sentences exceeding two lines in the group form of the MMPI (e.g. Item 233: "I have at times stood in the way of people who were trying to do something, not because it amounted to much but because of the principle of the thing" ; See Appendix F for Part III).

The fourth and final subtest of the ICT; Colloquial Expressions (Col. Exp.), is made up of eight items that were selected at random from a list of 12 MMPI items containing certain colloquialisms (cf. Dahlstrom & Welsh, 1960) that may not enjoy such widespread usage today as they did in 1943 when the MMPI was first constructed (e.g. Item 70: "I used to like drop-the-handkerchief." ; See Appendix G for Part IV).

The MMPI items included in ICT I-IV are representative of the three validity as well as the ten clinical scales (See Appendix H for scale distribution).

Procedure: Subjects were informed that they would be given a number of tests designed to measure reading ability, I.Q. and personality. All participants in the present study were assured that these tests were to be

used solely for research dealing with the advisability of using certain tests in correctional settings. Subjects were also assured that test results would not be accessible to anyone other than the tester without their written permission. It was also stressed that no one was bound to agree to the testing and that no adverse circumstances would result from a refusal to participate in the study. In addition, subjects were informed that the testing required a commitment of $2\frac{1}{2}$ - $3\frac{1}{2}$ hours and that they could request an interpretation of their results if they so desired.

Each subject was seen individually and a preliminary check of reading ability was conducted by asking all subjects to read aloud the first five items of the MMPI. Of the 72 subjects selected for the study, four refused to be tested and eight experienced such great difficulty in reading the first five items that they were eliminated from further testing. This left a total of 60 subjects who completed all aspects of the study. In addition, MMPI profiles were examined for validity according to the validity criteria of Megargee and Bohn (1979) on classifying criminal offenders using the MMPI. According to the authors, profiles with elevated F-scale T scores must be examined carefully (i.e. greater than T80) and those with T scores exceeding 100 are generally indicative of random responding

and are thus most often considered to be invalid. None of the subjects' profiles violated their validity criteria.

For Part I (Voc.) of the ICT the subject was asked to read the sentence to himself and then to give the meaning of the underlined word, within the context of that sentence. Responses were recorded verbatim and later scored by two independent raters who marked the definitions dichotomously (0 = not understood ; 1 = understood).

For Part II (DN), subjects were merely asked to circle True or False for the 25 items. Inconsistencies (i.e. answering in the same direction) between Part II (DN) items and the corresponding MMPI items were later tabulated. Items answered in different directions were scored as right and items answered in the same direction were marked wrong.

For Part III (Lg. Sent.), subjects were asked to read the sentence to themselves and then to give its meaning in their own words. Once again, responses were recorded verbatim and subsequently scored dichotomously by the two raters.

For Part IV (Col. Exp.), subjects were asked to read the items to themselves and to give the meaning of the underlined phrase. Responses were recorded verbatim and later scored dichotomously.

Inter-rater agreement ($\frac{\text{\# of quests. agreed on per S}}{N}$) x 100)

for Voc. was 95.9%; for Lg.Sent. it was 90.1% and for

Col. Exp. , 96.4%.

Finally, each subject was shown to an adjoining room and the first 399 items of the MMPI (Form-R) were administered. In addition, each subject was asked to leave blank any item that he did not understand and to record the item number on a separate sheet of paper.

Data Analysis. Descriptive statistics were computed for each of the demographic, test and MMPI variables. Similar analyses were conducted for each of the ICT measures.

A correlation matrix was provided to determine the extent to which the MMPI scales; ICT subtests, demographic characteristics (age, grade level, SES) and test scores (WRAT, I.Q.) were interrelated.

The demographic and test variables and the ICT measures, in combination and alone, were used as predictors in a stepwise linear multiple regression analysis on each of the MMPI subscales. The differential validity of the effect of comprehension on the MMPI was assessed by examining the correlation between select MMPI scales within groups defined as high and low on comprehension (on the basis of the ICT).

CHAPTER III

RESULTS

Table 1 presents the means and standard deviations of subjects' raw scores on each of the MMPI scales with the K-corrected T scores included in brackets.

Consistent with the fact that this sample is comprised of incarcerated offenders, Pd and Ma scores were most prominent. The means and SD's respectively for each of the comprehension subtests were as follows: ICT I-Voc. (32.93; 5.07)³, ICT II-DN (20.22; 2.48), ICT III-Lg. Sent. (12.55; 1.99) and ICT IV-Col. Exp. (5.52; 1.56).

Correlations between demographic, comprehension and MMPI variables. The intercorrelations between age, SES, I.Q., grade, WRAT and ICT I-IV are presented in Table 2. Most of the correlations between the demographic and test variables were significant at the .05 level or better. ICT-II-DN had the fewest significant correlations.

Table 3 presents the correlation matrix computed for age, SES, I.Q., WRAT and ICT subtests with each of the MMPI scales. A number of the MMPI scales were significantly correlated with these variables, particularly scales F, K, Pt, Sc and Si.

Multiple Regression. Two stepwise linear regression analyses were conducted. The first, for each of the MMPI

Table 1

Means and Standard Deviations for MMPI Scales

Scale	Raw Scores		K-Corrected T-Scores	
	Mean	SD	Mean	SD
?	3.83	6.18	---	---
L	4.80	2.44	52.03	8.41
F	8.18	4.62	61.80	10.33
K	13.37	5.11	51.80	9.68
Hs	6.71	5.17	55.98	12.25
D	19.98	4.79	58.00	11.50
Hy	20.62	4.99	57.35	9.30
Pd	22.68	5.07	71.20	10.92
Mf	24.28	4.17	57.87	8.51
Pa	11.30	3.94	59.67	11.43
Pt	14.12	8.64	58.95	11.60
Sc	14.35	9.00	60.27	12.84
Ma	21.73	5.65	68.97	13.15
Si	24.37	8.52	50.15	9.82

Table 2

Intercorrelations Between Demographic, Test and ICT Variables

	Age	SES	IQ	GR	WRAT	ICT			
						I	II	III	IV
Age	-	.18	.46**	.22*	.30**	.28*	.08	.01	.34**
SES	-	-	.52**	.38**	.30**	.39**	.15	.27*	.38**
I. Q.	-	-	-	.61**	.75**	.77**	.29*	.54**	.51**
GR	-	-	-	-	.55**	.42**	.12	.47**	.39**
WRAT	-	-	-	-	-	.67**	.30**	.58**	.32**
I - Voc.	-	-	-	-	-	-	.21*	.62**	.49**
II - DN	-	-	-	-	-	-	-	.26*	.11
III - Lg.S.	-	-	-	-	-	-	-	-	.26*
IV - Col. Ex.	-	-	-	-	-	-	-	-	-

* p < .05

** p < .01

Table 3

Intercorrelations Between Demographic and Test Variables and MMPI Scales

	ICT									
	Age	SES	IQ	GR	WRAT	I	II	III	IV	
?	-.05	-.11	-.22	-.03	-.15	-.32**	.14	.02	-.13	
L	.24*	.14	.08	.01	.02	-.03	.07	-.10	.00	
F	-.18	-.24*	-.34**	-.43**	-.28*	-.30**	-.37**	-.29*	-.24*	
K	.36**	.39**	.44**	.36**	.26*	.36**	.29*	.28*	.35**	
Hs	-.08	.03	-.09	-.09	-.03	-.16	-.17	-.15	-.19	
D	.01	.07	-.20	-.24*	-.33**	-.29*	-.30**	-.29*	-.03	
Hy	.17	.44**	.23	.11	.14	.09	-.03	.14	.19	
Pd	-.34**	.02	-.12	-.33**	-.17	.01	-.18	.03	.05	
Mf	.22*	.39**	.26*	.11	.31**	.31**	.06	.16	.23	
Pa	-.09	.08	-.16	-.11	-.09	-.06	-.30**	-.06	-.06	
Pt	-.24*	-.24*	-.35**	-.36**	-.24*	-.32**	-.30**	-.36**	-.19	
Sc	-.25*	-.23*	-.28*	-.33**	-.16	-.18	-.32**	-.23*	-.18	
Ma	-.21	-.23*	-.10	-.09	.11	.08	-.06	-.06	-.20	
Si	-.22*	-.36**	-.48**	-.40**	.36**	-.47**	-.36**	-.38**	-.03	

* p < .05

** p < .01

scales using the ICT subtests as predictors. The second regression employed not only the ICT subtests as predictors, but also other variables of interest (age, SES, I.Q., grade, WRAT) that were related to the ICT subtests.

The results of these analyses (R, Beta and F ratio associated with each predictor) are presented in Tables 4 - 5. The criterion for inclusion of a predictor was that it contribute to the prediction by a minimum of 0.5% of the variance in the analysis (i.e. produce a change in R^2 of at least .005).

The influence of the comprehension subtests on the MMPI scales, as seen from Table 4, broke down into three relatively distinct categories. Little influenced, with reported multiple R's ranging between .14 - .25, were scales L, Pd, Hy and Hs. Significant influence, at a moderate level, was observed for scales Pa, Mf and Ma with multiple R's ranging from .30 - .32. The regression analysis demonstrated that the greatest amount of variance accounted for by comprehension variables was on Si, F, K, ?, Pt, Sc and D. The multiple R's ranged from .39 - .54, accounting for anywhere from 16 - 29% of the variance. Of the comprehension subtests, ICT-Voc. and ICT-DN, made the most substantial contributions to the variance.

The data presented in Table 5 illustrate the effects of ICT I-IV, age, SES, I.Q., grade level and WRAT reading level on MMPI scales. The multiple R's ranged from .33 (L) to .61(Si).

Table 4

Stepwise Regression Results: Comprehension Variables and MMPI Scales

	L			F					
Var.	Beta	F	Var.	Beta	F				
I- Vocab.	-.59	11.80**	III - Lg.S.	-.13	0.79	II-DN			
III- Lg.S.	.32	4.31**	II - DN	.10	0.51	I- Vocab.			
II - DN	.17	1.90				IV-Col.			
IV - Col.	.06	0.17				III-Lg.S.			
R = .46	F(4,55), 3.64*		R = .14	F(2.57), 0.52	R = .46	F(4,55), 3.60*			
R ² = .21	p < .05		R ² = .02		R ² = .21	p < .05			
	K			Hs			D		
Var.	Beta	F	Var.	Beta	F	Var.	Beta	F	
I- Vocab.	.20	2.19	IV- Col.	-.15	1.30	II- DN	-.24	3.50*	
II- DN	.21	3.21*	II- DN	-.13	0.96	I- Vocab.	-.23	1.74	
IV- Col.	.23	2.72	III- Lg.S.	-.07	0.33	IV- Col.	.14	0.93	
R = .47	F(3,56), 5.08**		R = .25	F(3,56), 1.26	R = .41	F(4,55), 2.76*			
R ² = .22	p < .01		R ² = .06		R ² = .17	p < .05			

* p < .05

** p < .01

Table 4 (cont'd)

Hy			Pd			Mf		
Var.	Beta	F	Var.	Beta	F	Var.	Beta	F
IV - Col.	.20	1.81	II- DN	-.20	2.13	I - Vocab.	.26	3.25*
III- Lg.S.	.17	1.02	III- Lg.S.	.08	0.33	IV- Col.	.10	0.46
I - Vocab.	-.11	0.32						
II- DN	-.07	0.29						
R = .24	F(4,55), 0.80		R = .20	F(2,57), 1.08		R = .32	F(2,57), 3.24*	
R ² = .06			R ² = .04			R ² = .10	p < .05	
Pa			Pt			Sc		
Var.	Beta	F	Var.	Beta	F	Var.	Beta	F
II- DN	-.30	5.79*	III- Lg.S.	-.22	1.97	II- DN	-.28	4.61**
			II- DN	-.21	2.90*	III- Lg.S.	-.13	0.96
			I- Vocab.	-.11	0.43	IV- Col.	-.12	0.85
			IV- Col.	-.06	0.17			
R = .30	F(1,58), 5.79*		R = .44	F(4,55), 3.27*		R = .38	F(3,56), 3.06*	
R ² = .09	p < .05		R ² = .19	p < .05		R ² = .14	p < .05	

* p < .05

** p < .01

Table 5

Stepwise Regression Results: Demographic & Test Variables and MMPI Scales

		L			F		
Var.	Beta	F	Var.	Beta	F	Beta	F
I-Vocab.	-.51	6.49*	Age	.28	4.20*	-.40	8.87**
III-Lg.S.	.37	5.27*	SES	.18	1.64	-.33	7.87**
II-DN	.18	2.09	I-Vocab.	-.13	0.74	-.15	1.00
Age	.15	1.13	IV-Col.	-.10	0.41	.17	1.00
I.Q.	-.16	0.55				-.08	0.41
R = .48		F(5,54), 3.13*	R = .33		F(4,55), 1.51	R = .56	
R ² = .23		p < .05	R ² = .11			F(5,54), 4.89**	
						R ² = .32	
						p < .01	
		K			Hs		
Var.	Beta	F	Var.	Beta	F	Var.	Beta
I.Q.	.08	0.10	IV-Col.	-.18	1.44	WRAT	-.16
SES	.19	1.90	II-DN	-.17	1.54	II-DN	-.27
Age	.27	3.99	SES	.16	1.21	SES	.22
II-DN	.21	3.03	III-Lg.S.	-.13	0.53	Grade	-.25
Grade	.20	1.71	WRAT	.22	1.40	I-Vocab.	-.33
WRAT	-.27	2.00	I-Vocab.	-.17	0.66	I.Q.	.23
III-Lg.S.	.11	0.48				IV-Col.	.10
I-Vocab.	.13	.45					0.50
R = .59		F(8,51), 3.39**	R = .34		F(6,53), 1.08	R = .50	
R ² = .35		p < .01	R ² = .12			F(7,52), 2.52*	
						R ² = .25	
						p < .05	

* p < .05 ** p < .01

Table 5 (cont'd)

Hy		Pd		Mf	
Var.	Beta	F	Var.	Beta	F
SES	.47	10.87**	Age	-.39	8.25**
II-DN	-.13	1.12	Grade	-.53	13.05**
Age	.13	0.86	IV-Col.	.23	3.03
I-Vocab.	-.31	2.32	I.Q.	.19	0.96
III-Lg.S.	.22	1.66	II-DN	-.21	3.24
Grade	-.16	1.03	III-Lg.S.	.14	0.95
I.Q.	.18	0.55	SES	.10	0.54
R = .52		F(7,52), 2.59*	R = .58		F(7,52), 3.82**
R ² = .27		p < .05	R ² = .34		p < .01
Pa		Pt		Sc	
Var.	Beta	F	Var.	Beta	F
II-DN	-.29	4.77*	III-Lg.S.	-.25	2.26
SES	.24	2.66	Age	-.20	2.53
I.Q.	-.41	2.79	II-DN	-.24	3.86
WRAT	.15	0.55	Grade	-.25	3.23
I-Vocab.	.12	0.37	WRAT	.27	2.22
			I-Vocab.	-.13	0.55
R = .40		F(5,54), 1.94	R = .54		F(6,53), 3.48**
R ² = .16			R ² = .29		p < .01
Hy		Pd		Mf	
Var.	Beta	F	Var.	Beta	F
SES	.42	8.90**	SES	.42	8.90**
WRAT	.36	3.58	WRAT	.36	3.58
Grade	-.13	0.77	Grade	-.13	0.77
Age	.19	1.92	Age	.19	1.92
I.Q.	-.39	2.26	I.Q.	-.39	2.26
I-Vocab.	.20	1.15	I-Vocab.	.20	1.15
R = .52		F(6,53), 3.16**	R = .52		F(6,53), 3.16**
R ² = .27		p < .01	R ² = .27		p < .01
Pa		Pt		Sc	
Var.	Beta	F	Var.	Beta	F
Grade	-.30	3.89*	Grade	-.30	3.89*
II-DN	.30	5.65	II-DN	.30	5.65
Age	-.24	3.30	Age	-.24	3.30
WRAT	.28	2.68	WRAT	.28	2.68
III-Lg.S.	-.16	1.00	III-Lg.S.	-.16	1.00
SES	-.08	0.39	SES	-.08	0.39
IV-Col.	.03	0.06	IV-Col.	.03	0.06
R = .52		F(7,52), 2.69*	R = .52		F(7,52), 2.69*
R ² = .27		p < .05	R ² = .27		p < .05

* p < .05
** p < .01

Table 5 (cont'd)

		Ma		Si	
<u>Var.</u>	<u>Beta</u>	<u>F</u>	<u>Var.</u>	<u>Beta</u>	<u>F</u>
SES	-.20	1.81	I.Q.	-.06	0.06
WRAT	.35	3.30	II-DN	-.27	5.22*
Age	-.24	2.79	I-Vocab.	-.34	3.49
III-Lg.S.	-.31	3.48*	Grade	-.24	2.64
I-Vocab.	.43	4.19*	SES	-.13	1.03
IV-Col.	-.17	1.33	WRAT	.17	0.85
I.Q.	-.22	0.75	IV-Col.	.11	0.60
			Age	-.09	0.49
R = .49		F(7,52), 2.38*	R = .61		F(8,51), 3.71**
R ² = .25		p < .05	R ² = .37		p < .01

* p < .05

** p < .01

Eight scales - Si, K, Pd, F, Pt, Sc, Hy and D - had multiple R's of at least .50 with the predictor variables.

A frequency count of predictors showed ICT subtests Voc. and DN, grade, WRAT and age as being the prominent contributors to the variance. Most of these variables are correlated with each other (see Table 2), although some to a much lesser degree than others. For example, ICT - DN shares relatively little variance with ICT - Voc., grade, WRAT and age.

A further examination of the Double Negatives subtest was provided. Although it is a measure of comprehension, DN is also a measure of internal consistency in subjects' responses. The possibility exists that responses on DN might be affected by the subjects' response style e.g. acquiescence. As a result, each subject's consistency in responding to the MMPI items and to corresponding changed items in ICT - DN was examined. There were 287 examples of inconsistencies where a subject did not change his response with a change in the wording of an item. In 132 cases (46%), the inconsistency occurred when subjects answered True to both the MMPI item and the transformed DN item. In 155 cases (54%), the inconsistency resulted when subjects answered False to both the MMPI item and the transformed DN item. Nineteen subjects gave more "trues" than "falses" ("yeasayers", $t = 7.24$, $p = .01$), while 30 subjects responded in the reverse direction ("naysayers",

$t = 8.06, p .01$). Nine subjects had an equal number of True and False responses and two had no inconsistencies. The proportion of subjects classified as "yeasayers" or "naysayers" was not significant ($\chi^2 = 2.45, p .05$).

Differential Validity. In order to examine whether the validity of the MMPI was in any way affected by the ability to comprehend as defined by the ICT, MMPI inter-scale correlations were assessed for high and low comprehension groups. ICT subtests I, IV were collapsed to yield a global ICT score. As a result of this, 23 subjects were classified as high scoring and 23 as low scoring according to their ICT scores. Of the 91 comparisons made, only 6 were significant, just about what might be expected to occur by chance.

Study 2

Procedure.

In an attempt to assess the clinical significance of the results of Study 2, a double-blind procedure was initiated in which three independent raters were asked to classify 60 profiles into several categories. These raters were clinicians with varied experience in corrections. Rater #1 has worked with the MMPI in correctional settings for several years and has employed the test extensively, clinically, and in a research capacity. Rater #2 has had approximately four months' experience with the MMPI in correctional

settings while Rater #3 has had one year's experience using the MMPI in corrections. These clinicians were asked to rate the MMPI profiles on a 7-point scale on the following criteria:

(1) Rate the validity of the profiles for purposes of clinical interpretation where, (1) = valid profile... (3-4) = some question as to validity... (7) = invalid profile:

(2) Rate the profiles in terms of the extent of clinical pathology that is present where, (1) = no clinical pathology... (3-4) = some clinical pathology... (7) = severe pathology.

(3) Rate these profiles in terms of whether you would refer the subject for further assessment and/or intervention by a psychologist or psychiatrist within the correctional system, where (1) = no need for referral... (3-4) = some indications of a need for referral... (7) definite need for referral.

In the analysis of data obtained from the clinical judgements, 7-point Likert ratings were collapsed to create two groups for each judge in each category. The groups so formed correspond to judgements of (1) little or no question as to MMPI profile validity vs. definite question as to profile validity; (2) little or no evidence of significant psychopathology vs. some or definite indications of psychopathology; and (3) little or no need for referral vs. some definite indications of a need for subsequent referral.

Results

The Likert ratings for each of the three clinical judges

on the dimensions of profile validity, degree of pathology and need for referral were collapsed to create one low (Group 1 = ratings of 1 or 2) and one high (Group 2 = ratings of 3 - 7) scoring group on each dimension for each judge. One-way analyses of variance were conducted between the groups, so formed on each of the ICT subtests as a means of determining if comprehension may have been related to judges' ratings on the three dimensions. Few significant differences were found. In the case of "validity" judgements, Rater #1's invalid MMPI profiles group (i.e. ratings of 3 - 7) had significantly lower scores on ICT - Voc. ($F = 10.08$ (1, 58), $p = .01$) and on ICT - Lg. Sent. ($F = 7.11$ (1, 58), $p = .01$).

No significant differences were reported for any of the comparisons for "degree of pathology" or "need for referral" dimensions.

CHAPTER IV

DISCUSSION

The results of the present study indicate that the reading/comprehension abilities of offenders are related to their performance on the MMPI. The MMPI comprehension subtests employed in this study produced multiple R's of significant magnitude. For seven of the fourteen MMPI scales (?, F, K, D, Pt, Sc, Si), the comprehension subtests accounted for 14 - 29% of the variance. Of these subtests, Voc and DN made the most substantial contributions. When variables related to comprehension i.e. age, SES, I.Q., grade level and WRAT were added to the prediction equation, the amount of variance accounted for on MMPI scales ranged from 10 - 37%, with eight of the fourteen scales (K, F, Hy, D, Pd, Pt, Sc, Si) having multiple R's of at least .50 (25% of the variance) with the predictors.

These findings strongly suggest that factors other than those related strictly to personality i.e. comprehension, reading ability, grade level, I.Q., age and SES, are in operation and contribute significantly to the variance of MMPI scales. Most of the previous studies in this area have examined only one or two variables at a time and were limited to reporting only simple correlational data (cf. Dahlstrom, Welsh & Dahlstrom, 1972). The results presented in Study 1 are consistent with those of Davis and Jones (1974) and

Cowan, Watkins and Davis (1975) which revealed that individuals with limited education and an impoverished socioeconomic background (and who might be expected to have poor reading comprehension levels) tend to produce more "pathological" MMPI profiles.

The demographic data obtained from subjects who participated in the present study are certainly generalizable since they are similar to those reported in large normative studies of offenders in Canada (cf. Gendreau, Madden & Leipziger, 1979). The subjects' tested I.Q. levels and MMPI data were consistent with those found for Canadian offenders (Gendreau, Grant, Leipziger & Collins, 1979) and also for some U.S. samples (Dahlstrom, Welsh and Dahlstrom, 1972; Megargee and Bohn, 1980). These results, however, may not be generalizable to specialized offender groups. There were, for example, no Black, Hispanic or Indian offenders in the present sample, nor were extreme groups of crime types e.g. violent crimes, sexual offences, over-represented in the present study.

Several examples of internal validity were illustrated by the results of Experiment 1. Using Megargee and Bohn's (1980) criteria it was established that no profiles were so invalid as to warrant exclusion from the study. Also of note, is that an examination of the data produced in the present study indicated no systematic acquiescence response set. In addition, the intercorrelations between the demographics,

I.Q. and WRAT tests, MMPI scales and comprehension subtests were in predicted directions. For example, comparisons between K and age, SES, I.Q., grade, ICT- Voc. and ICT- Col.Exp. yielded significant (.01 level) positive correlations, thus indicating that individuals who produced higher K scores tended to be older, more intelligent, better educated and of a higher socioeconomic status than those with low K scores. These subjects were also shown to have a better understanding of the MMPI items (as measured by Voc. and Col.Exp.). These findings are consistent with those of previous studies where higher SES and education were found to be related to higher K scores (cf. Graham, 1979). They are also related to the results of Ward & Ward's (1980) study where it was found that a higher grade level (7.2) was necessary for adequate comprehension of items in the K scale than for those in other MMPI scales.

Although an attempt was made to resolve questions pertaining to the effects of MMPI item comprehension on the test's validity, this issue still remains somewhat problematic. The one measure of validity used in Experiment 1, differential validity, indicated that individuals with high vs. low comprehension of MMPI items did not generate results that affected the differential validity of the test in any significant manner. However, this conclusion should be viewed with caution since differential

validity is only one of many different types of validity. Further research must be done to determine the effects of MMPI item comprehension on other types of validity i.e. construct and predictive. For example, in order to examine the effects of MMPI item comprehension on construct validity, the MMPI profiles of good and poor comprehenders could be correlated with profiles obtained from tests with reduced comprehension difficulty e.g. Form E of the 16PF and Ward and Selby's (1980) IRF.

It must be noted that relatively few inmates produced extremely poor scores on the ICT subtests. It is possible that the majority of offenders in the present study did not perform below a "critical threshold" of comprehension. Nevertheless, there may well be select correctional samples (e.g. minority groups such as Blacks, Hispanics and Indians or other disadvantaged peoples) who would produce such poor results on the ICT subtests (i.e. below the "critical threshold") that the validity of their MMPI profiles would be affected. On the other hand, such subject samples might often fail to read the first five items of the MMPI successfully and thus be disqualified from taking the test.

Study 2 was a preliminary attempt at assessing the relationship between offenders' ability to comprehend a sample of MMPI items and judgements by three clinicians

on three dimensions i.e. profile validity, degree of pathology and need for referral. The results of this study, however, indicated that the degree of inter-rater variability was excessively large and hence no firm conclusions could be drawn from the data. The low level of inter-rater agreement is perhaps not surprising given that clinicians come to the corrections field with different degrees of training and experience in clinical assessment and often adopt different standards for rating MMPI profiles. It is interesting to note that the one judge who employed Megargee and Bohn's (1980) criteria for classification of MMPI profiles, sorted his valid and invalid profiles in such a way that the groups correlated with ability to comprehend the MMPI. This judge (Rater #1) accepted more of the profiles as being of adequate validity than did the other judges, and the subjects that he identified as having produced the more invalid profiles could be differentiated on a number of variables. The finding that this judge's "more invalid" group had significantly (.01 level) lower scores on ICT - Voc. and ICT - Lg. Sent., as well as lower I.Q.'s and grade levels, is in accordance with the hypothesis of the present study which states that poor comprehension of MMPI items by some inmates can influence clinicians' judgements regarding the validity of the profiles. Although these data are tentative, they do suggest that future researchers in this area might examine the relationship between

comprehension variables and different procedural standards for rating MMPI profiles. Such a study would require substantially more judges than were used in Study 2 as well as clearly defined procedural guidelines for judges to follow in rating profiles.

The results of the present study have practical implications for MMPI usage with correctional populations. These findings support those of Dahlstrom, Welsh and Dahlstrom (1972) which illustrate the need for brief intellectual and reading assessment measures as a means of identifying subjects who may have difficulty completing the MMPI. As Gearing (1979) noted, very few MMPI studies have provided screening in this area. Although Gearing concentrated on the research literature, it is very likely that a similar neglect of the aforementioned screening procedures exists in clinical practice.

It is suggested that, at the very least, some form of quick, easily administrable I Q. assessment as well as some measure of reading ability be provided prior to administering the MMPI. In addition, there are several demographic characteristics (e.g. age, education, SES) that should be routinely recorded. In cases where poor reading levels are exhibited, it would be advisable to consider oral administration of the MMPI.

Another alternative might be to make use of such tests as Ward and Selby's (1980) Improved Readability

Form (IRF), a 167-item short form of the MMPI that was constructed by excluding items that (1) were excessively long, syntactically complex or highly abstract; (2) required negation in order to endorse the content of the item; (3) were inappropriate for illiterate subjects; (4) were redundant in import to an included item.

Yet another alternative might be to rewrite the more difficult MMPI items so that they can be understood by offender samples and other less literate individuals. This was done with the 16PF Test where Eber and Cattell (1976) constructed Form E of the 16PF which can be read easily by a person functioning at approximately the third grade reading level. In order to construct such a test from the MMPI, the vocabulary difficulty of some of the words would have to be reduced, double negatives eliminated, colloquial expressions revised and the length of some sentences reduced.

Such a major change in the MMPI is not likely to be effected in the near future. Thus, correctional clinicians should realize that among offender populations those who have difficulty tend to be younger, to have lower I.Q.'s, less education and to come from lower socioeconomic levels. These factors are likely to produce greater elevations on some of the validity and clinical scales of the MMPI. Providing explicit recommendations to clinicians with regard

to the interpretation of these elevations is beyond the scope of the present study although it is clear that the ability of individuals to comprehend the MMPI must given consideration.

A possible alternative explanation for the results of the present study, however, comes from an examination of the social competence construct advanced by Turner and Gantrell (1978). These authors suggest that the widely reported relationships between marital status, social class position, work performance and the occurrence and outcome of psychological disorder constitute secondary associations which have been derived largely from social selection processes. In essence, this position holds that the more pathological an individual, the less likely he is to display socially effective behaviour and, as a result, the less likely he is to get married, achieve higher social status and perform well at work. Turner and Gantrell (1978) view social competence as an acquired capacity for socially effective behaviour "residing in the skin of the individual" (p.371). It can be defined broadly as the ability to solve the problems or tasks posed by society.

In the present study, the MMPI profiles of offenders who have lower I.Q.'s, education and socioeconomic backgrounds appear to be somewhat more pathological. An explanation of these results using the social competence construct would maintain that the more pathological offenders would be the least socially competent and would thus have lower I.Q., reading and comprehension levels and achieve lower social status.

While offenders in this category may have some difficulty in comprehending the MMPI, it is possible that the increased elevations which they produce on certain MMPI scales also reflect, in part, actual inadequacies in their obtained levels of social competence.

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APPENDIX A.

PAGE 4, READING
LEVEL II

Two letters in name (2)	A	B	O	S	E	R	T	H	P	I	U	Z	Q	(13)	15
milk	city	in	tree	animal	himself	between	chin	split	form						25
grunt	stretch	theory	contagious	grieve	toughen	aboard	triumph								33
contemporary	escape	eliminate	tranquillity	conspiracy	image	ethics									40
deny	rancid	humiliate	bibliography	unanimous	predatory	alcove									47
scald	mosaic	municipal	decisive	contemptuous	deteriorate	stratagem									54
benign	desolate	protuberance	prevalence	regime	irascible	peculiarity									61
pugilist	enigmatic	predilection	covetousness	soliloquize	longevity	abysmal									68
ingratiating	oligarchy	coercion	vehemence	sepulcher	emaciated	evanescence									75
centrifugal	subtlety	beatify	succinct	regicidal	schism	ebullience									82
misogyny	beneficent	desuetude	egregious	heinous	internecine	synecdoche									89

FOR INDIVIDUAL AND GROUP COMPARISONS USE ONLY STANDARD SCORES ON PAGES 16 TO 42 OF MANUAL.

LEVEL I—GRADE NORMS										LEVEL II—GRADE NORMS																	
Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade	Score	Grade								
1	N.5	16-17	Kg.6	36-37	1.9	53	3.3	66	5.3	79	8.1	92	12.9	0	Pk.5	16	1.3	29	4.4	42	6.8	55	9.3	68	13.0	81	16.8
2	N.8	18	Kg.7	38	2.0	54	3.5	67	5.5	80	8.4	93	13.3	1	Pk.8	17	1.5	30	4.6	43	6.9	56	9.6	69	13.2	82	17.1
3	Pk.1	19-20	Kg.8	39-40	2.1	55	3.6	68	5.7	81	8.7	94	13.7	2	Kg.1	18	1.7	31	4.8	44	7.1	57	9.9	70	13.5	83	17.4
4	Pk.2	21	Kg.9	41	2.2	56	3.8	69	5.9	82	9.0	95	14.1	3-4	Kg.2	19	1.8	32	5.0	45	7.3	58	10.2	71	13.8	84	17.7
5	Pk.4	22	Gr.1.0	42-43	2.3	57	3.9	70	6.1	83	9.3	96	14.5	5-6	Kg.3	20	2.0	33	5.2	46	7.5	59	10.5	72	14.1	85	18.0
6	Pk.5	23	1.1	44	2.4	58	4.1	71	6.3	84	9.7	97	14.9	7	Kg.4	21	2.2	34	5.4	47	7.7	60	10.8	73	14.4	86	18.3
7	Pk.7	24-25	1.2	45-46	2.5	59	4.2	72	6.5	85	10.1	98	15.4	8	Kg.5	22	2.4	35	5.6	48	7.9	61	11.3	74	14.7	87	18.6
8	Pk.9	26-27	1.3	47	2.6	60	4.4	73	6.7	86	10.5	99	15.8	9	Kg.6	23	2.6	36	5.8	49	8.1	62	11.6	75	15.0	88	19.0
9	Kg.1	28-29	1.4	48	2.7	61	4.5	74	6.8	87	10.9	100	16.2	10-11	Kg.7	24	2.8	37	6.0	50	8.3	63	11.9	76	15.3	89	19.5
10-11	Kg.2	30-31	1.5	49	2.8	62	4.7	75	7.0	88	11.3			12	Kg.8	25	3.2	38	6.2	51	8.5	64	12.2	77	15.6		
12	Kg.3	32-33	1.6	50	2.9	63	4.8	76	7.2	89	11.7			13	Kg.9	26	3.5	39	6.3	52	8.7	65	12.4	78	15.9		
13-14	Kg.4	34	1.7	51	3.0	64	5.0	77	7.5	90	12.1			14	Gr.1.0	27	3.9	40	6.5	53	8.9	66	12.6	79	16.2		
15	Kg.5	35	1.8	52	3.1	65	5.1	78	7.8	91	12.5			15	1.1	28	4.2	41	6.6	54	9.1	67	12.8	80	16.5		

LEVEL I

cat	see	red	to	big	work	book	eat	was	him	how	36
then	open	letter	jar	deep	even	spell	awake	block	size		46
weather	should	lip	finger	tray	felt	stalk	cliff	lame	struck		56
approve	plot	huge	quality	sour	imply	humidity	urge				64
bulk	exhaust	abuse	collapse	glutton	clarify						70
recession	threshold	horizon	residence	participate	quarantine						76
luxurious	rescinded	emphasis	aeronautic	intrigue	repugnant						82
putative	endeavor	heresy	discretionary	persevere	anomaly						88
rudimentary	miscreant	usurp	novice	audacious	mitosis						94
seismograph	spurious	idiosyncrasy	itinerary	pseudonym	aborigines						100

APPENDIX B

Q U I C K T E S T

FORM 1		FORM 2		FORM 3
4 belt (easy)		2 cans (easy)		2 sheet (easy)
1 dancing		3 chewing		1 exercise
4 traffic		4 falling		2 machine
4 whistle		3 dinner		4 burners
3 fence	5	1 cow	5	1 audience
2 drink (easy)		2 groceries (easy)		3 dish (easy)
3 wreck		4 hat		2 drying
1 music		3 sitting		3 food
2 medicine		1 country		3 fork
4 gun	10	4 danger	10	1 crowd
2 pepper (easy)		3 plate (easy)		3 slice (easy)
3 racing		1 river		2 washing
2 salt		3 tasting		4 tears
1 woman		2 shelves		1 fighting
2 sugar	15	1 sky	15	4 kitchen
3 track (easy)		3 table (easy)		3 tasty (easy)
4 school (6)		4 carelessness (6)		2 windy (6)
1 partner (6)		3 manners (6)		4 pitiful (6)
1 couples (7)		2 adding (7)		1 contest (7)
3 rail (7)	20	4 injury (7)	20	4 sorrow (8)
4 respectful (8)		2 merchandise (8)		1 loser (7)
3 betting (8)		3 waitress (8)		4 heartbreak (8)
3 daring (9)		1 horizon (9)		1 struggle (9)
3 stadium (9)		2 retail (9)		2 rotary (10)
4 pedestrian (10)	25	1 irrigation (10)	25	1 opponents (9)

1 graceful (10)		4 unaware (10)		4 grief (10)
2 fluid (11)		1 current (11)		3 utensils (11)
2 solution (11)		1 fertile (11)		2 lever (11)
4 discipline (12)		4 descending (12)		3 portion (12)
3 bleachers (12)	30	1 spacious (12)	30	3 edible (12)

2 crystallized (13)		2 proprietor (13)		1 exhibition (13)
1 turntable (13)		4 inattentive (13)		4 soothed (13)
2 saccharin (14)		3 indulging (14)		4 caress (14)
4 immature (14)		1 precipitation (14)		1 combatant (14)
1 cordiality (15)	35	1 freshet (15)	35	4 forlorn (15)

3 velocity (15)		4 transom (15)		3 nutrient (15)
4 decisive (16)		3 consumption (16)		4 solace (16)
3 laceration (16)		1 aquatic (16)		1 pacify (16)
3 foliage (17)		4 perilous (17)		1 contorted (17)
4 imperative (17)	40	1 terrain (17)	40	4 jets (17)

1 intimacy (18)		4 imminent (18)		4 doleful (18)
2 concoction (18)		2 foresight (18)		3 tines (18+)
1 conviviality (18+)		1 condensation (18+)		4 disconsolate (18)
4 chevrons (18+)		3 satiation (hard)		3 sustenance (18+)
2 condiment (hard)	45	3 visceral (hard)	45	4 maudlin (hard)

3 cacophony (hard)		1 bovine (18+)		3 gustatory (hard)
2 miscible		3 replete (hard)		4 poignant
2 imbibe		3 prehension		1 bellicose
1 amicable		4 ingress		3 comestible
2 pungent	50	3 celerity	50	4 despondency

SCORE: _____

APPENDIX C

Word Frequency Chart for Part I

MMPI # ICT #	Word	Freq. /5 mil.	Freq. /1 mil.	Grades								
				3	4	5	6	7	8	9	X	
364 (1)	vulgar	5	0.56	0	0	0	0	2	1	2	0	
278 (2)	critically	13	1.62	0	0	1	4	5	1	2	0	
23 (3)	nausea	6	0.41	0	0	3	1	0	1	0	1	
113 (4)	enforcement	2	0.11	0	0	1	0	0	1	0	0	
60 (5)	editorial	15	1.58	0	0	1	0	1	9	3	1	
154 (6)	convulsion	2	0.11	0	0	0	0	1	0	1	0	
209 (7)	unpardonable	1	0.00	0	0	0	0	1	0	0	0	
238 (8)	restlessness	6	0.41	1	0	0	2	3	0	0	0	
14 (9)	diarrhea	17	0.85	0	0	0	0	0	15	2	0	
115 (10)	hereafter	5	0.44	0	0	0	1	1	0	3	0	
343 (11)	trifling	6	0.41	0	0	0	0	0	5	0	1	
126 (12)	dramatics	7	0.61	0	1	0	4	0	2	0	0	
431 (13)	misfortunes	4	0.36	0	0	2	2	0	0	0	0	
398 (14)	shrink	20	2.25	0	1	0	5	3	5	4	2	
82 (15)	downed	4	0.30	0	2	0	0	2	0	0	0	
277 (16)	cleverness	9	0.95	1	1	2	3	1	0	1	0	
38 (17)	petty	7	0.68	0	0	0	0	2	2	3	0	
244 (18)	misunderstood	10	1.23	0	1	0	0	2	1	4	2	
193 (19)	asthma	4	0.22	0	0	2	0	1	0	1	0	
204 (20)	journalist	7	0.68	0	0	1	0	2	2	1	1	
119 (21)	slurring	1	0.00	0	0	0	0	0	1	0	0	
191 (22)	annoys	1	0.00	0	0	0	0	0	0	0	1	
133 (23)	indulged	4	0.40	0	1	0	1	0	0	1	1	
43 (24)	fitful	4	0.31	0	0	0	2	0	1	0	1	

APPENDIX C (cont'd)

MMPI # ICT #	Word	Freq. /5 mil.	Freq. /1 mil.	Grades									
				3	4	5	6	7	8	9	X		
40 (25)	daydream	22	2.22	1	3	5	1	10	1	1	0		
172 (26)	bashful	1	0.00	0	0	0	0	1	0	0	0		
63 (27)	bowel	.1	0.00	0	0	1	0	0	0	0	0		
371 (28)	self-conscious	16	1.85	0	0	2	1	9	3	1	0		
215 (29)	excessively	3	0.24	0	0	0	0	2	0	1	0		
273 (30)	numbness	6	0.64	0	0	1	1	1	2	1	0		
264 (31)	self-confident	14	1.87	2	0	1	2	1	5	2	1		
219 (32)	contractor	3	0.23	0	0	0	0	1	1	1	0		
18 (33)	constipation	6	0.27	0	0	2	0	1	0	3	0		
319 (34)	inwardly	6	0.49	0	1	0	1	2	2	0	0		
146 (35)	wanderlust	2	0.11	1	1	0	0	0	0	0	0		
236 (36)	brood	20	2.45	2	1	0	4	5	6	2	0		
121 (37)	plotted	16	1.04	1	2	2	2	4	0	4	1		
387 (38)	urine	3	0.30	0	0	0	0	0	2	1	0		
72 (39)	discomfort	11	1.45	0	0	0	2	6	0	2	1		
327 (40)	unreasonable	15	1.81	0	0	0	1	2	5	5	2		

APPENDIX D

ICT Part I - Vocabulary

- (1) People say insulting and vulgar things about me.
- (2) I have often felt that strangers were looking at me critically.
- (3) I am troubled by attacks of nausea and vomiting.
- (4) I believe in law enforcement.
- (5) I do not read every editorial in the newspaper every day.
- (6) I have never had a fit or convulsion.
- (7) I believe my sins are unpardonable.
- (8) I have periods of such great restlessness that I cannot sit long in a chair.
- (9) I have diarrhea once a month or more.
- (10) I believe in a life hereafter.
- (11) I usually have to stop and think before I act even in trifling matters.
- (12) I like dramatics.
- (13) I worry quite a bit over possible misfortunes.
- (14) I shrink from facing a crisis or difficulty.
- (15) I am easily downed in an argument.
- (16) At times I have been so entertained by the cleverness of a crook that I have hoped he would get by with it.
- (17) During one period when I was a youngster I engaged in petty thievery.
- (18) My way of doing things is apt to be misunderstood by others.
- (19) I do not have spells of hay fever or asthma.
- (20) I would like to be a journalist.
- (21) My speech is the same as always (not faster or slower, or slurring; no hoarseness).
- (22) Sometimes when embarrassed, I break out in a sweat which annoys me greatly.
- (23) I have never indulged in any unusual sex practices.

APPENDIX D (cont'd)

- (24) My sleep is fitful and disturbed.
- (25) Most anytime I would rather sit and daydream than to do anything else.
- (26) I frequently have to fight against showing that I am bashful.
- (27) I have had no difficulty in starting or holding my bowel movement.
- (28) I am not unusually self-conscious.
- (29) I have used alcohol excessively.
- (30) I have numbness in one or more regions of my skin.
- (31) I am entirely self-confident.
- (32) I think I would like the work of a building contractor.
- (33) I am very seldom troubled by constipation.
- (34) Most people inwardly dislike putting themselves out to help other people.
- (35) I have the wanderlust and am never happy unless I am roaming or travelling about.
- (36) I brood a great deal.
- (37) I believe I am being plotted against.
- (38) I have had no difficulty starting or holding my urine.
- (39) I am troubled by discomfort in the pit of my stomach every few days or oftener.
- (40) My mother and father made me obey even when I thought that it was unreasonable.

APPENDIX E

ICT Part II - Double Negative

- | | | |
|--|------|-------|
| (1) I mind being made fun of..... | True | False |
| (2) I am gaining (or losing) weight..... | True | False |
| (3) My feelings are easily hurt..... | True | False |
| (4) I can understand what I read as well
as I used to..... | True | False |
| (5) I believe I am more nervous
than most others..... | True | False |
| (6) I have been in trouble with the law..... | True | False |
| (7) I often or always have dizzy spells..... | True | False |
| (8) I am likely to speak to people even
if they don't speak to me first..... | True | False |
| (9) It bothers me that I am not better
looking..... | True | False |
| (10) I always tell the truth..... | True | False |
| (11) I have often done dangerous things
for the thrill of it..... | True | False |
| (12) There was a time in my life when I
liked to play with dolls..... | True | False |
| (13) It would make me nervous if members
of my family got into trouble with
the law... .. | True | False |
| (14) These days I find it easy to keep up
the hope of amounting to something..... | True | False |
| (15) The sight of blood frightens me
and makes me sick..... | True | False |
| (16) I am usually happier when I am not
alone..... | True | False |
| (17) I would blame a person for trying to
grab everything he can in this world... .. | True | False |
| (18) It is hard for me to ask help from my
friends especially if I can't return
the favor..... | True | False |

APPENDIX E (cont'd)

- (19) I often worry about my health.....True False
- (20) I very often feel pain in the back
of the neck.....True False
- (21) I care about what happens to me.....True False
- (22) I have been in trouble because of my
sex behaviour.....True False
- (23) Some people seem to understand me.....True False
- (24) I mind meeting strangers.....True False
- (25) I have enemies who really wish to harm me..True False

APPENDIX F

ICT Part III - Long Sentences

- (1) In a group of people I would not be embarrassed to be called upon to start a discussion or give an opinion about something I know well.
- (2) It makes me uncomfortable to put on a stunt at a party even when others are doing the same sorts of things.
- (3) People generally demand more respect for their own rights than they are willing to allow for others.
- (4) Sometimes I am strongly attracted by the personal articles of others such as shoes, gloves, etc. so that I want to handle or steal them though I have no use for them.
- (5) I have had attacks in which I could not control my movements or speech but in which I knew what was going on around me.
- (6) I have at times stood in the way of people who were trying to do something, not because it amounted to much, but because of the principle of the thing.
- (7) The man who provides temptation by leaving valuable property unprotected is as much to blame for its theft as the one who steals it.
- (8) Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.
- (9) A person should try to understand his dreams and be guided by or take warning from them.
- (10) I prefer to pass by school friends or people I know but have not seen for a long time unless they speak to me first.
- (11) I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.
- (12) It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.
- (13) I have had periods in which I carried on activities without knowing later what I had been doing.
- (14) I have been inspired to a program of life based on duty which I have since carefully followed.
- (15) I find it hard to set aside a task that I have undertaken even for a short time.

APPENDIX G

ICT Part IV - Colloquial Expressions

- (1) I used to like drop-the handkerchief.
- (2) My people treat me more like a child than a grownup.
- (3) I am a good mixer.
- (4) As a youngster I was suspended from school one or more times for cutting up.
- (5) Sometimes when I am not feeling well, I am cross.
- (6) I resent having anyone take me in so cleverly that I have had to admit that it was one on me.
- (7) I have met problems so full of possibilities that I have been unable to make up my mind about them.
- (8) When I take a new job I like to be tipped off on who should be gotten next to.

APPENDIX H

MMPI Scales from which items for ICT I-IV were drawn

<u>Scale</u>	<u># of items</u>
L	3
F	8
K	4
Hy	7
D	9
Hs	6
Pd	7
Mf	11
Pa	7
Pt	2
Sc	9
Ma	9
Si	10