

## MMPI CONTENT SCALES:

### INTERPRETATIVE NORMS AND CORRELATIONS WITH OTHER SCALES<sup>1</sup>

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Interpretative norms for the MMPI content scales were derived from the "revised" Minnesota normative groups of adult men and women assembled by S. R. Hathaway and P. F. Briggs in 1957. Such norms permit the expression of MMPI content scale scores in terms of a population comparable to that employed for the MMPI clinical scale profile sheets. Content scale norms were also presented for samples of midwestern and northwestern state university undergraduate men and women. These latter norms do not differ substantially from the norms for southern university students presented in 1970 by R. D. Fowler, Jr., and F. A. Coyle, Jr. Correlations between the content scales and scales from four other standard personality and interest inventories suggested that the content scales represent basic dimensions of self-report that are generalizable across a variety of instruments and scale construction techniques.

The Minnesota Multiphasic Personality Inventory (MMPI) content scales (Wiggins, 1966, 1969) were developed with the aim of providing the clinician with an additional source of interpretative information of a kind that has tended to be ignored and denigrated by proponents of the empirical method of scale construction. The content scales serve to clarify the manifest content of the S's communications to the tester or institution he represents. It is argued that the view of a testing situation as an opportunity for communication between the S and the tester (Carson, 1969; Leary, 1957) has much to commend it; not the least of which is the likelihood that this is the frame of reference adopted by the S himself. To emphasize the importance of such communications is not to advocate a return to the naive or "correspondence" view of self-reports as veridical representations of the Ss' internal states

(Buchwald, 1961; Meehl, 1945). Instead, an emphasis is placed on the *fact* that an S presents himself in a given manner, and that fact is conceptualized at a level of analysis that Dahlstrom (1969) has recently identified as falling midway between the naive rational and ultraempirical views of test response. The interpretative significance of both the content and strategy of such self-presentations has been discussed by Carson (1969).

The MMPI content scales were designed, by both psychometric and intuitive procedures, to be internally consistent, moderately independent, and representative of the major substantive dimensions that exist in the MMPI item pool. The results of factor analyses of the original 26 item-content categories designated by Hathaway and McKinley (1940) were used to identify reliable dimensions of self-report, which were representative of the total item pool rather than simply that portion of the pool that has proved useful in the construction of empirical scales. Rational and item-analytic procedures were then employed to construct a revised set of 13 content scales that met minimum standards of internal consistency and independence from each other. These final scales were designated Social Maladjustment (SOC), Depression

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(DEP), Feminine Interests (FEM), Poor Morale (MOR), Religious Fundamentalism (REL), Authority Conflict (AUT), Psychoticism (PSY), Organic Symptoms (ORG), Family Problems (FAM), Manifest Hostility (HOS), Phobias (PHO), Hypomania (HYP), and Poor Health (HEA).

Although the MMPI content scales have been shown to have potential for discriminating among traditional psychiatric groups, the scales are probably best employed as a supplementary source of information to that provided by the standard MMPI clinical scale profile (Wiggins, 1966). Such supplemental interpretations require that the content scales be expressed in terms of the same normative base as the standard clinical scales.

Gilberstadt's (1970) comprehensive system of automated MMPI interpretation provides *T*-score values for the MMPI content scales that are based on a sample of Air Force enlisted men. Fowler and Coyle (1970) have presented normative data for the MMPI content scales based on a large sample of freshman college students from a southern state university. Such normative data may facilitate interpretation in college populations, and, indeed, the present paper presents evidence that the Fowler-Coyle norms are substantially representative of university students from other geographical regions as well. More importantly, however, the present paper presents normative data for the MMPI content scales that are directly comparable to the norms employed in the standard MMPI clinical scale profile. In addition, correlations with other MMPI scales and with scales from other personality inventories are provided in order to clarify the relationships between content scales and other self-report measures.

#### METHOD

The MMPI content scales were scored in three separate samples of male and female Ss. An adult sample of visitors to the University of Minnesota hospitals provided norms for the content scales that are comparable to those employed for the standard clinical scales. A college sample of midwestern and northwestern state university undergraduates provided norms for the content scales that were, in turn, compared to the southern university norms reported by Fowler and Coyle (1970). A third sample consisted of University of Oregon undergraduates who had been administered an extensive battery of

personality and interest tests in addition to the MMPI. In this third sample, the MMPI content scales were correlated with a variety of scales from other inventories.

#### *Minnesota Norms*<sup>3</sup>

MMPI protocols from the "revised" Minnesota normative group (Hathaway & Briggs, 1957) now serve as the standard set of protocols from which norms for new MMPI scales are derived (Dahlstrom & Welsh, 1960). Incomplete and defective protocols in the original normative sample were removed and replaced by additional protocols from the original *S* pool (Hathaway & Briggs, 1957). Although the revised sample includes some unmarried persons, the sample is otherwise comparable to the original in terms of age, education, and socioeconomic level (Hathaway & Briggs, 1957).

The available protocols of the revised Minnesota sample of men ( $N = 225$ )<sup>4</sup> and revised Minnesota sample of women ( $N = 315$ ) were transferred to magnetic tape for subsequent computer scoring of the content scales. The means and standard deviations of each content scale were computed separately for men and women. Since these MMPI protocols were collected prior to the introduction of the 55 "masculinity-femininity" items which were based on the earlier work of Terman and Miles (1936), it was necessary to "correct" the scores on those scales into which such items entered by estimating the effects of the missing items on the means and standard deviations.<sup>5</sup>

<sup>3</sup> The authors wish to express their appreciation to George S. Welsh for his assistance in obtaining protocols for the revised Minnesota group.

<sup>4</sup> One protocol from the male sample was unusable.

<sup>5</sup> A procedure was adopted that is similar to that employed by Hathaway and Briggs (1957, pp. 365-366). The complete MMPI records of a sample of Minnesota college students (Goldberg & Rorer, 1963) provided estimates of endorsement frequencies and item intercorrelations for the missing items. Scale means were estimated by adding endorsement percentages of missing items (reflected in the keyed direction) to the scale mean based on available items. Scale standard deviations were estimated by adding the variances and estimated covariances of the missing items to the scale variance based on available items. This procedure was first tested by estimating the means and standard deviations of the 12 special MMPI scales reported by Hathaway and Briggs (1957). The resulting estimates were close approximations to those previously reported.

In the case of the MMPI content scales, the number of missing items was quite small. Complete item responses were available for six of the content scales; one item was missing from five of the scales; and three items were missing from one of the scales (MOR). As might be expected, however, all but two of the items in the FEM scale were unavailable. In the absence of a reasonably comparable normative

### State University Norms

Complete MMPI protocols for undergraduates attending state universities were available from several sources in the midwest and northwest regions of the country. The samples were (a) 100 University of Illinois men (Skrzypek & Wiggins, 1966) and 83 University of Illinois women (Baker, 1967), (b) 95 University of Oregon men and 108 University of Oregon women (Goldberg & Rorer, 1963), and (c) 96 University of Minnesota men and 125 University of Minnesota women (Goldberg & Rorer, 1963). These data were pooled to form a "state university undergraduate" normative group of 291 men and 316 women. Since complete item protocols were available, it was unnecessary to correct the means and standard deviations. Although these samples are smaller than those presented by Fowler and Coyle (1970) for 1,538 men and 1,173 women, they provide a broader geographic base and permit comparison with the larger southern university norms.

### Correlations with Other Scales

The correlations of the MMPI content scales with a variety of MMPI scales and scales from other inventories were obtained from a study of student learning and personality characteristics conducted by Goldberg (1969). In the course of this study, an extensive battery of personality and interest inventories was administered to approximately 900 introductory psychology students over a period of nine weeks. Due to expectable attrition, not all tests were administered to all Ss. The present results are based on an average of 320 male and 404 female undergraduates from the University of Oregon.

**MMPI scales.** Of special interest was a comparison of the present content scales with the seven MMPI item-cluster scales developed by Tryon (1966). The Tryon scales were developed by the application of a cluster-analytic technique (Tryon & Bailey, 1966) to the 550 MMPI items, without regard for specific item content. The resultant seven nonoverlapping scales were judged to be internally consistent and representative of the major oblique clusters of the MMPI item pool (Tryon, 1966). It was anticipated that each of the cluster scales would have a counterpart among the MMPI content scales. Additional MMPI scales considered were the standard clinical scales, the factor scales developed by Welsh (1956), and other personality scales relating to such characteristics as dependency, hostility, and emotional maturity (Dahlstrom & Welsh, 1960).

**Other inventories.** Additional scales employed were (a) the 15 standard need scales from the Edwards Personal Preference Schedule (EPPS; Edwards, 1959), (b) the 18 standard scales of Gough's (1957) California Psychological Inventory (CPI), (c) the

group, it was decided to arbitrarily use the state university norms for the FEM scale. Thus, like its *Mf* counterpart among the clinical scales, the present norms for the FEM scale are not comparable to those derived for the other content scales.

15 need scales developed by Gough and Heilbrun (1965) for the Adjective Check List (ACL), and (d) scales relating to masculinity versus femininity of interest from the revised (Campbell, 1966) Strong Vocational Interest Blank (SVIB).

## RESULTS AND DISCUSSION

### Minnesota Norms

Means and standard deviations of the content scales for the Minnesota adult men and women appear in the left half of Table 1. The general tendency for women to score slightly higher than men on most of the scales indicates the desirability of separate norms for men and women. The largest difference between men and women, other than on the FEM scale, occurs on Phobias, in which women score 3 scale points higher than men. The remaining differences involved only 1 or 2 scale points.

The *T*-score values may be obtained by substituting appropriate values in the formula<sup>6</sup>

$$T = 50 + \frac{(\text{raw score} - M) 10}{SD}$$

Such *T* scores permit the expression of MMPI content scale scores in terms of a population comparable to that employed for the standard MMPI clinical scale profile sheets.

### State University Norms

It is of interest to compare the present midwestern and northwestern state university norms with the southern university norms presented by Fowler and Coyle (1970). As a first step, *t* tests were computed between means on each of the scales for males and females separately. With samples of this size, small raw-score differences may be statistically significant and yet be of little practical import from the standpoint of profile interpretation (Black, 1956). Differences in scale means between two samples may be evaluated more realistically when both means are expressed as *T* scores with reference to a common normative sample. For this reason, the scale means from the state and southern university samples were converted to *T* scores based on the Minnesota adult male and female normative

<sup>6</sup> Complete *T*-score conversion tables for both the Minnesota adult and state university samples are available, without charge, from the first author.

TABLE 1  
 MEANS AND STANDARD DEVIATIONS FOR MMPI CONTENT SCALES IN THE REVISED  
 MINNESOTA ADULT AND STATE UNIVERSITY SAMPLES

Content scale	Revised Minnesota norms				State university norms			
	Men ( <i>N</i> = 225)		Women ( <i>N</i> = 315)		Men ( <i>N</i> = 291)		Women ( <i>N</i> = 316)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SOC	8.60	4.81	10.20	5.15	8.31	5.44	7.36	5.16
DEP	7.04	5.11	8.72	5.08	6.77	4.80	6.38	4.37
FEM	9.12	3.60	19.82	3.42	9.12	3.60	19.82	3.42
MOR	7.99	4.93	9.82	5.02	6.54	4.63	7.20	4.23
REL	6.32	3.03	7.17	2.74	5.75	3.25	6.32	2.98
AUT	9.50	4.02	8.04	3.72	8.92	4.02	6.07	3.40
PSY	8.05	5.78	7.67	5.06	6.87	4.33	5.89	3.72
ORG	5.34	4.26	6.87	4.57	3.96	3.33	3.66	2.98
FAM	3.69	2.33	4.07	2.48	4.14	2.93	4.09	2.78
HOS	9.47	4.93	8.61	4.64	9.80	4.70	7.08	3.41
PHO	5.61	3.76	8.99	4.40	4.78	2.96	7.19	3.81
HYP	11.86	4.42	12.51	4.19	12.79	3.70	13.09	3.54
HEA	4.91	3.86	5.94	3.91	4.13	2.74	4.14	2.83

samples. From this conversion, it became apparent that raw-score mean differences that were significant at the .05 level correspond to *T*-score differences of 0 or 1 point. Raw-score differences at the .001 level correspond to *T*-score differences of 3 or more points. Such comparisons involve the rounding effects that occur when averages are converted to an integer score.

The only mean scale differences between the male samples that are not entirely due to rounding artifacts occur on REL and AUT. The mean raw-score differences on these scales ( $p < .001$ ) represent differences of three *T*-score units. Southern males appear to hold slightly more fundamentalist religious beliefs and to be slightly more cynical than their midwestern and northwestern counterparts. With reference to the Minnesota adult norms, the state university students fall slightly below the average adult score ( $T = 49$ ), and the southern students fall slightly above the average adult score ( $T = 52$ ) on REL. On AUT, both the state university group ( $T = 46$ ) and the southern university group ( $T = 49$ ) fall below the Minnesota adult average score. Although the state university sample may be more geographically diverse, the

southern university sample is of a most impressive size ( $N = 1,538$ ). Given the slight differences that occurred between means from the two samples, it would seem that either of these norms could be confidently applied to male college students. The conclusion of Goodstein (1954) that regional differences in MMPI clinical scales are insignificant for male college students would seem to be substantially true for the MMPI content scales as well.

When *t* tests were computed between scale means from the state university and southern university female samples, more and larger differences were found. In terms of the Minnesota adult norms, southern university females scored higher ( $T = 48$ ) than state university females ( $T = 45$ ) on PHO. The same pattern of differences was found between southern university females ( $T = 48$ ) and state university females ( $T = 45$ ) on HEA. More striking, however, was the difference of seven *T*-score units that occurred on REL between southern university females ( $T = 53$ ) and state university females ( $T = 46$ ). It would appear that southern university females hold more fundamentalist religious beliefs than their midwestern and northwestern counter-

parts. Other than these differences, the mean scale scores of the two samples are roughly comparable.

#### *Correlations with the Tryon Cluster Scales*

Table 2 lists the scales from the MMPI, EPPS, CPI, ACL, and SVIB that had the highest correlations with individual MMPI content scales. It is satisfying to note the convergences between the Tryon cluster scales and their corresponding MMPI content scales. These scale sets were constructed via different strategies, the cluster scales emphasizing dimensional representation and the content scales emphasizing substantive representation. Nevertheless, it is clear from the correlations that the seven dimensional clusters of the Tryon scales are well represented by seven content scales. In the construction of the cluster scales, items were discarded that failed to relate to the overall dimensional structure of the item pool. In the construction of the content scales, items were discarded that failed to relate to substantive clusters that were rationally identified. Thus, it is likely that the six additional content scales, which do not correspond directly to the cluster scales, represent somewhat finer substantive elaborations of the major dimensions—dimensions which are “specific” in the factorial sense (e.g., REL).

#### *Correlations with Other Scales*

The pattern of relationships between each of the MMPI content scales and various scales from the MMPI, EPPS, CPI, ACL, and SVIB may be discerned from an examination of Table 2. In this table, only the highest from among numerous significant correlations are presented.<sup>7</sup> Although the interpretative significance of these relationships is not elaborated in great detail, a brief comment is made concerning each of the content scales in turn.

**SOC.** From the MMPI correlates alone, it is apparent that the Social Maladjustment content scale corresponds to the popular concept of “introversion–extraversion” (Wiggins,

1966). In the EPPS, this is represented by a correlation with Dominance, and in the CPI, this is evident in the correlations with a variety of scales reflecting social skills and self-attitudes. Correlations with the ACL scales reflect the same pattern and emphasize the extraverted component of heterosexuality.

**DEP.** The MMPI correlates of the Depression content scale indicate a close alignment with the first factor of the MMPI and with Tryon's *Depression* cluster. CPI and ACL correlates reflect subjectively experienced distress, a need for help, and a tendency toward intolerance.

**FEM.** The Feminine Interests content scale is related, but far from equivalent, to the femininity scales of the MMPI, CPI, and SVIB. When the various femininity scales were correlated with the dichotomous criterion of sex of respondent, the correlations were as follows: FEM = .80; Fe = .69; Mf = .67; and SVIB M–F = .65. That the FEM scale should be most efficient in making this distinction is not surprising, considering the manner in which it was constructed (Wiggins, 1966). Whether the FEM scale has other, more practical, uses remains to be demonstrated.

**MOR.** The Poor Morale scale is also closely aligned with the first factor of the MMPI and related to a rational scale of dependency. Both the EPPS and the ACL suggest a pattern involving self-blame, a lack of dominance, and a need for help. The negative relationship with achievement is apparent in both the CPI and the ACL. In addition, the CPI suggests subjectively experienced distress, difficulty in concentrating, and a lack of sociability.

**REL.** The Religious Fundamentalism scale appears to measure a highly specific dimension that is not represented in other standard personality inventories. As expected, the scale is related to religious activities on the SVIB. As previously noted (Wiggins, 1966), this scale may be related to impression management (*Sd*), and it is negatively correlated with originality.

**AUT.** The Authority Conflict scale embodies the view that life is a jungle and that everyone should get away with whatever he can (Wiggins, 1966). This dimension is re-

<sup>7</sup> Inquiries concerning other content scale correlates, or intercorrelations among the various inventories, should be addressed to the second author.

TABLE 2

CORRELATIONS OF MMPI CONTENT SCALES WITH SCALES FROM THE MMPI, EPPS, CPI, ACL, AND SVIB IN SAMPLES OF 320 MEN AND 404 WOMEN FROM THE UNIVERSITY OF OREGON

Social Maladjustment (SOC)	Male sample	Female sample	Depression (DEP)	Male sample	Female sample	Feminine Interests (FEM)	Male sample	Female sample			
MMPI			MMPI			MMPI					
<i>Introversion</i>	93	93	Factor I	91	90	Masculinity-Femininity	68	59			
Social Introversion	90	89	<i>Depression</i>	91	89	CPI					
Factor III	81	80	Psychasthenia	88	88	Femininity	50	43			
EPPS			CPI			SVIB					
Dominance	-42	-40	Well-Being	-63	-58	Femininity	47	24			
CPI			Tolerance	-54	-52	Mechanical	-34	-31			
Sociability	-71	-76	ACL								
Dominance	-58	-56	Succorance	51	48						
Social Presence	-55	-58	Personal Adjustment	-45	-38						
Self-Acceptance	-55	-60									
ACL											
Heterosexuality	-58	-61									
Affiliation	-56	-52									
Self-Confidence	-56	-57									
Dominance	-54	-59									
Exhibitionism	-51	-58									
Poor Morale (MOR)	Male sample	Female sample	Religious Fundamentalism (REL)	Male sample	Female sample	Authority Conflict (AUT)	Male sample	Female sample			
MMPI			MMPI			MMPI					
Factor I	90	88	Social Desirability	42	44	Hostility	80	76			
Dependency	88	88	Originality	-39	-30	<i>Suspicion</i>	70	66			
Personal Variance	87	88	SVIB			Undercontrol	67	63			
EPPS			Religious Activity	43	46	CPI					
Dominance	-41	-31				Tolerance	-62	-59			
Abasement	38	35				Self-Control	-54	-48			
Succorance	38	29				Responsibility	-53	-48			
CPI						Well-Being	-50	-41			
Well-Being	-59	-54									
Intellectual Efficiency	-56	-54									
Sociability	-56	-52									
Achievement-Conformance	-54	-43									
ACL											
Succorance	58	50									
Dominance	-50	-42									
Abasement	47	45									
Achievement	-40	-34									
Psychoticism (PSY)	Male sample	Female sample	Organic Symptoms (ORG)	Male sample	Female sample	Family Problems (FAM)	Male sample	Female sample			
MMPI			MMPI			MMPI					
Schizophrenia	72	76	Hypochondriasis	77	74	Psychopathy	58	55			
Factor I	69	67	<i>Body Symptoms</i>	67	68	Alpha Factor	-52	-52			
<i>Autism</i>	68	65	Schizophrenia	66	64	Emotional Immaturity	51	47			
CPI			CPI			CPI					
Well-Being	-55	-47	Well-Being	-53	-44	Well-Being	-49	-45			
Self-Control	-51	-41	Achievement-Conformance	-48	-34	Socialization	-45	-52			
Tolerance	-50	-47	Tolerance	-46	-32	Self-Control	-39	-38			
Intellectual Efficiency	-47	-38	Self-Control	-44	-37	Achievement-Conformance	-38	-31			
Manifest Hostility (HOS)	Male sample	Female sample	Phobias (PHO)	Male sample	Female sample	Hypomania (HYP)	Male sample	Female sample	Poor Health (HEA)	Male sample	Female sample
MMPI			MMPI			MMPI			MMPI		
<i>Resentment</i>	85	80	Facilitation	-61	-50	Undercontrol	64	64	Hypochondriasis	80	83
Hostility	77	77	Personal Variance	61	52	Hypomania	62	69	Alpha Factor	-69	-62
Undercontrol	76	78	Psychoneurosis	60	54	Hostility	61	55	<i>Body Symptoms</i>	62	60
EPPS			CPI			CPI			CPI		
Aggression	43	47	Well-Being	-40	-36	Self-Control	-55	-52	Well-Being	-50	-42
CPI						Achievement-Conformance	-45	-40	Intellectual Efficiency	-43	-36
Self-Control	-62	-56				ACL					
Good Impression	-61	-52				Self-Control	-38	-36			
Well-Being	-53	-49				Aggression	38	33			
Achievement-Conformance	-50	-46									
ACL											
Aggression	39	35									
Nurturance	-38	-40									

Note.—Decimals are omitted. The names of the Tryon (1966) cluster scales are italicized to indicate the pattern of relationships between these scales and the MMPI content scales.

lated to hostility, suspicion, and undercontrol on the MMPI. On the CPI it suggests intolerance, undercontrol, irresponsibility, and subjectively experienced distress.

**PSY.** The Psychoticism content scale is related to Schizophrenia, *Autism*, and the first factor of the MMPI. CPI correlates suggest distress, undercontrol, intolerance, and difficulty in concentrating.

**ORG.** The Organic Symptoms content scale is related to Hypochondriasis, *Body Symptoms*, and Schizophrenia on the MMPI (the latter due to the considerable number of somatic items in the *Sc* scale). On the CPI, the pattern is similar to that of PSY, involving distress, undercontrol, intolerance, and poor achievement.

**FAM.** The MMPI correlates of the Family Problems content scale reflect psychopathy and emotional immaturity. Similar patterns on the CPI suggest an undersocialized, poorly controlled individual. Distress and poor academic achievement are also present.

**HOS.** The Manifest Hostility content scale is related to *Resentment and Aggression*, Hostility, and Undercontrol on the MMPI. Correlations with Aggression were also obtained in both the EPPS and CPI. In addition, the CPI suggests undercontrol, negative impression management, distress, and low academic achievement.

**PHO.** The Phobias content scale is related to the "sensitization" pole of Ullmann's (1962) empirical measure of facilitation versus inhibition of recognition of threatening stimuli. It is also related to Block's (1953) psychoneurotic cluster and to the neurotic cluster scale of Estes and Hathaway (Meehl & Hathaway, 1946). The Phobias scale is slightly related to subjective distress on the CPI.

**HYP.** As expected, the Hypomania scale is related to undercontrol, hypomania, and hostility on the MMPI. The highest CPI and ACL correlates reflect the same dimension. HYP is related to aggression in the ACL and to poor academic achievement in the CPI.

**HEA.** As was true of the Organic Symptoms content scale, Poor Health is related to Hypochondriasis and *Body Symptoms* on the MMPI and subjective distress on the CPI. Although differing in the specific nature of somatic symptoms, both HEA and ORG tend

to be related to general measures of bodily concern.

In general, the above correlational results provide consistent and convincing evidence for the convergent validity of the MMPI content scales. Most of the MMPI content scales are substantially correlated with corresponding or closely related scales from other inventories, whether these other scales were constructed by rational, empirical, or cluster-analytic procedures. The correlations of the content scales with cluster, rational, and other specially constructed scales clarify the meaning of the content scales within the MMPI itself. The correlations of the content scales with the EPPS, CPI, and ACL indicate a generalizability that transcends MMPI method variance. The substantive dimensions represented by the MMPI content scales appear to be basic dimensions of self-report that are generalizable across a variety of instruments and scale construction techniques.

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