The MMPI continues to be the focus of a large quantity of research. This article offers an aid to persons working with college student populations by annotating recent MMPI research relating to college populations. A total of 49 articles (each categorized in terms of content into one of 10 sections or subsections) were annotated. The Validity of the MMPI includes the following subsections: Concurrent Validity (1) Comparison with other tests (2) Empirical Discrimination between Groups; Predictive Validity (1) Prediction of Performance and Academic Achievement (2) Prediction of Adjustment; Construct Validity (1) Group Differences (2) Studies of Internal Structure (3) Studies of Change Over Occasions. Other sections include Computer and Actuarial Applications, Normative Studies and New Scales. (Author/DJ)
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ANNOTATED BIBLIOGRAPHY OF MMPI
RESEARCH AMONG COLLEGE POPULATIONS: 1962-1970

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Abstract
The MMPI continues to be the focus of a large quantity of research. This article offers an aid to persons working with college student populations by annotating recent MMPI research relating to college populations. A total of 49 articles (each categorized in terms of content into one of 10 sections or subsections) were annotated.
Kleinmuntz, in his earlier bibliography of MMPI research, pointed out that researchers and clinicians alike did not have available to them a composite of MMPI research related to college student populations. In that many persons using the MMPI are working in and with college populations, such a composite is desirable if not necessary. The present paper is an updated version of Kleinmuntz’s original work. In a few cases the entries contained in this paper were published prior to 1962. These are studies not included in the Kleinmuntz original for one reason or another, e.g., they were in press at the time.

Research reports using college students just because they happened to provide a convenient subject pool (e.g., personality characteristics of smokers vs. nonsmokers) have not been included in this bibliography. This listing is directed to those who work with and for college students and it was felt that only items that contributed to knowledge of students as students should be included. Likewise, in several instances articles have been included which did not use college students as subjects, but were considered relevant to working with college students.

The schematic plan of this bibliography was borrowed from Kleinmuntz. Categories have been omitted where there were no current entries and the category Computer and Actuarial Applications has been added. Within each

1For a bibliography of College MMPI research prior to 1962 see Kleinmuntz, Journal of Counseling Psychology, 9, 1962.
section papers appear alphabetically and are numbered consecutively throughout.

Plan of Bibliography

<table>
<thead>
<tr>
<th>Sections</th>
<th>Subsections</th>
<th>Bibliography Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validity of the MMPI</td>
<td>Concurrent Validity</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Comparison with other tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Empirical Discrimination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Between Groups</td>
<td>2 - 12</td>
</tr>
<tr>
<td></td>
<td>Predictive Validity</td>
<td>13 - 19</td>
</tr>
<tr>
<td></td>
<td>Prediction of Performance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and Academic Achievement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prediction of Adjustment</td>
<td>20 - 25</td>
</tr>
<tr>
<td></td>
<td>Construct Validity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group Differences</td>
<td>26 - 29</td>
</tr>
<tr>
<td></td>
<td>Studies of Internal Structure</td>
<td>30 - 36</td>
</tr>
<tr>
<td></td>
<td>Studies of Change Over</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occasions</td>
<td>37</td>
</tr>
<tr>
<td>Computer and Actuarial Applications</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>38 - 44</td>
</tr>
<tr>
<td>Normative Studies</td>
<td></td>
<td>45 - 46</td>
</tr>
<tr>
<td>New Scales</td>
<td></td>
<td>47 - 49</td>
</tr>
</tbody>
</table>
Validity of the MMPI

I. Concurrent Validity

A. Comparison with Other Tests


   This article presents intercorrelations between the MMPI and SVIB. Forty-six of the 290 correlations were significant (change = 15). Both the Mf and the Si scales have a large proportion of significant correlations with the SVIB. This method of analysis is contrasted with factor analysis.

B. Empirical Discrimination Between Groups


   MMPI profiles of 302 men from 10 "most troubled" residence halls were compared with the profiles of 297 men from 10 "least troubled" halls to ascertain the usefulness of using MMPI profiles to predict disciplinary type behavior. The author noted that scales 4, 8, & 9 had been shown to correlate positively and scales 2, 5, & 0 to correlate negatively with delinquency. Chi square frequencies showed a significantly larger occurrence of high points on scales 4, 8, & 9 in the troubled dorms and a significantly larger occurrence of high points on scales 2, 5, & 0 in the lesser troubled dorms. A cross-validation study designed to predict trouble did not get the same results.


   Three groups, college educated homosexuals, less educated homosexuals, and college educated nonhomosexuals and five high point codes, 59, 58, 57, and 54 were compared by a 3x5 chi square analysis and the results found to be significant. Within groups the only significant difference was between less educated homosexuals and college educated nonhomosexuals; a difference probably due to education. There was no significant difference between college educated homosexuals and college educated nonhomosexuals.

This study investigated differing responses of suicidal and nonsuicidal subjects when age, education, occupation, number of hospital admissions, and marital status were controlled and when they were not controlled. The findings suggest that controlling appropriate variables increased the differentiating ability of the MMPI.


To devise a system or test to predict the lethality of suicidal behavior, the authors compared nonsuicidal controls, threatened suicides, and committed suicides on six MMPI scales: Pa, Sc, Pt, Ma, Pd, and D. A discriminate analysis showed that threat suicides are most easily distinguishable, with the nonsuicidals, the attempts, and the commits second, third, and fourth. Efficiency of each group prediction was: threatened,.48; nonsuicidal,.42; attempted,.13; and committed,.12; or an overall efficiency of .41.


Although the MMPI does not differentiate all types of suicides from nonsuicides, it does do a good job in differentiating people who threaten suicide from all other groups.


In an attempt to validate a portion of psychoanalytic theory, the author contrasted MMPI profiles of reactive and developmentally obese subjects, the developmentally obese, theoretically, having a personality pattern containing more psychotic components. Eight null hypotheses were presented and none rejected. The study concluded that perhaps it was false to assume that personality characteristics could be observed and measured.

The several hypotheses studies were: 1) Physics and zoology majors compared with sociology and history majors are: (a) higher on D, (b) higher on Mf, (c) higher on Si, and (d) lower on Pd. 2) Upper GPA students when compared to lower GPA students are: (a) higher on Mf, (b) lower on Pd, and (c) lower on Ma. Only hypotheses 1c and 2a were supported.


This study compares normal achievers with both under and overachievers on the clinical and validity scales of the MMPI. Differences suggest that both deviant groups tend to be more anxious than normal achievers. The author also found that underachievers tend to externalize conflict while overachievers tend to internalize conflict.


This study contrasted MMPI profiles of referred for counseling and nonreferred male college students. The author found that the MMPI discriminated between referred and nonreferred male students on 11 of the 13 scales. Between self-referred and other referred males there was a significant difference on six of the 13 scales.


The author describes the personality characteristics of college students who achieve academically far beyond the average. For males the Mf scale was elevated significantly beyond that of the original norming sample. Mean Pt and Sc scores also showed elevation. Female high achievers scored within the normal range on all scales with the exception of K, the elevation of which is not unusual for college students in general. Comparison is also made with interest level as measured by the Kuder.


This study looked at the MMPI profiles of overt homosexuals and found that 24% had Mf and Ma as the highest codes, 17% had Mf and Sc as the highest codes, and 15% had Mf and D as the highest codes.
II Predictive Validity

A. Prediction of Performance and Academic Achievement


Previous studies have suggested that academic achievement is predicated on personal adjustment. This study found no relationship between normal, one peak, and maladjusted MMPI profiles and GPA, high school rank or score on the Minnesota Scholastic Aptitude Test, casting aspersions on previous findings.


Both male and female dropouts have a different MMPI high point distribution than do nondropouts. Scales 9 and 4 represent the most frequent high points for dropout males while scales 9 and 5 are the most frequent high points for male nondropouts. Female dropouts also had 9 and 4 high points while nondropouts had 9 and 3 high points.


Male college students were followed up 2-15 years after graduation to see how well the SVIB predicted their current occupation. Predictive validity was much better for subjects with normal MMPI profiles than for those with deviant MMPI profiles. The SVIB can be used with greater confidence for normal subjects than it can be for deviant subjects.


Scales 4 and 9, either used alone or in combination with each other, seem to be good predictors of underachievement, particularly when scale 5 was not included in one of the three highest codes of male college subject. While both 4 and 9 were good predictors, a 49 profile with an absence of 5 predicted the best. A cross validation study attained the same results.

Gifted women who graduated from college differ significantly on three MMPI scales from gifted women who do not graduate. Although all mean scores for both groups were within the normal range, graduates score significantly higher on the L scale and significantly lower on both Pd and Ma.


Seven subscales identified by Kleinmuntz were correlated with both scholastic achievement (GPA) and scholastic aptitude (ACT). The seven subscales were: academic achievement (Ac), college achievement (Ae), graduate school potential (Gr), honor point ratio (Hr), intellectual efficiency (Ie), originality (Or), and underachievement (Un). All scales but Un correlated significantly with GPA. All scales correlated significantly with ACT scores, the Un correlation being negative. The study implies that noncognitive factors can predict school performance and may be an indirect measure of intelligence.


360 males and 178 females were given the MMPI as freshman. This data was analyzed four years later to see if it would differentiate the curricular groups the students were in as seniors. The Mf scale was the only one that differentiated curricular groups for males with the following comparisons significant: engineering (eng) and English (Eng), Eng and zoology, Eng and history, Eng and math, Eng and chemistry, and Eng and physics, Eng and economics, pre-med and zoology, pre-med and Eng, accounting and Eng, and political science and Eng.

For females the Taylor Manifest Anxiety Scale differentiated curricular groups as follows: chemistry and Eng, chemistry and Eng and history, chemistry and elementary education, history and Eng, music and Eng, and psychology and Eng.

Comparing male science and nonscience majors, the F, Hs, and Pd scales significantly differed. With females only the L scale significantly differentiated science and nonscience majors.


To see if students who apply for personal adjustment counseling can be identified by incoming freshman MMPI profiles, the authors compared 40 male and 40 female profiles chosen at random from the persons who subsequently applied for counseling to a like number
of students, chosen at random, who did not apply for counseling. It was found that both male and female clients had significantly higher MMPI total mean scores and significantly higher neurotic tetrads scores than did nonclients. There was no significant difference between clients and nonclients on the Welsh Anxiety Index.


This study was an attempt to find out if college student who had taken the MMPI upon admission to college and sometime in the ensuing two years received psychiatric treatment could be differentiated from students who were admitted and tested at the same time but did not receive treatment. Thirty-four clinicians and seven inexperienced graduate students rated the MMPI profiles. Among the 34 clinicians the mean percentage of correct responses was 63 percent (p < .06). However, a simple actuarial prediction yielded a correct percentage of 70, which is significantly better than the clinicians (p < .02). Clinicians were not able to make more accurate predictions than were inexperienced students.


This study was an attempt to predict behavior of subjects under the influence of LSD based on pre-drug measures, including the MMPI. On the basis of a questionnaire subjects were divided into paranoid reactors and nonparanoid reactors. MMPI results for the two groups were then compared. There was also a comparison made between those whom LSD affected and those on whom it had no effect.


In an attempt to identify students who might subsequently be diagnosed as maladjusted, three successive classes of medical students were given the MMPI and then followed through their school career. Of the total number of students (249), 63 had profiles suggesting significant psychopathology. Of the 249 subjects, 37 were subsequently treated for psychiatric illness. However, only 10 of those treated were in the 63 with abnormal profiles were not known to have sought psychiatric help and approximately half of the subjects treated for psychiatric reasons had normal entering profiles.


With a college student sample (N = 72) the author found that a Mf T score above 70 correctly identified 75 percent of subjects who discussed homosexual problems. A scale previously devised by Panton for this purpose did only slightly better, correctly identifying 80 percent.

This study was not done with a college student population but is included here because of its significance. The study showed that a K raw score of 9-15 indicated good prognosis for therapy but anything at the two extremes was less promising.

III. Construct Validity

A. Group Differences


This study showed that subjects with high Sc scores give: 1) fewer symbolic associations; 2) more verbal contiguity associations; and 3) more idiosyncratic associations than do subjects with normal Sc scores. There was no significant difference between high and low Sc groups on either rhyming associations or affective associations.


Suggests that the sensitizer (higher A than R) adopts a protective pattern of goal setting in a failure situation, but that the repressor (higher R and A) does not seem to adopt a compensatory pattern.


The index of Status Characteristics, an instrument designed to assess social status, and the MMPI were given to 1805 healthy adult males to determine how MMPI scores vary as a function of education and defensiveness. Findings showed that: 1) K scores varied directly with the level of education; 2) when K was held constant, level of education varied directly with Mf and inversely with L and F; and 3) highpoints on D, Hy, and Pa were more frequent in educated subjects. Both defensiveness and educational achievement should be taken into consideration when interpreting or comparing MMPI profiles.


Twenty-five male and twenty-five female subjects and their parents who had volunteered were given the booklet form of the MMPI to determine the relationship between students and parents of the instrument. Tables showing the Spearman correlations are presented. Some notable differences were: males and fathers
correlated to a higher degree than males and mothers; females and mothers had more significant correlations than did females and fathers; there were more significant correlations between students and their parents on the psychotic triad scales than there were on the neurotic triad scales; and fathers and mothers of males correlated significantly on five scales while fathers and mothers of females did not correlate significantly on any scale.

B. Studies of Internal Structure


Noting that K seems to mean something different for a normal population than it does for a psychiatric population, the author wanted to find a method to improve the detection of "less severe maladjustment within a grossly normal population," particularly, to empirically determine K corrections for the clinical MMPI scales that would maximize discrimination between adjusted and maladjusted college students. The author did derive a new K weights that held up under cross validation. Major differences from the standard weighting system are a negative weighting on Hy and removing weights from Hs, Pd, and Ma. D, Mf, Pa, and Si "having sought help at the University Counseling Center...for personal adjustment problems."


The K scale, while originally meant to be a scale of defensiveness, is seen and used by some clinicians as a general level of adjustment - an index of "ego adequacy" - especially in a normal population. The purpose of this study was to look at two hypotheses: 1) "The K scale is a measure of psychological health (adjustment) in a normal population," and 2) "The K scale is not a measure of defensiveness in a normal population." Data indicated the first hypothesis to be invalid - the K scale was not found to differentiate between well adjusted and poorly adjusted samples. In that there was a significant correlation between K and another measure of defensiveness the author took the difference between the two significant correlations, found that to be also significant and supports the second hypothesis on this basis. The author then goes on to argue that the second hypothesis validates the first.

This study contrasted the MMPI profiles of students who took the MMPI under normal test conditions, a group of the same students who were retested and asked to be completely accurate, and a group of the same students who retook the MMPI under the same conditions as the first time. Subjects retaking the MMPI under "accurate" instructions were considered to be more anxious. Nonanxious subjects endorsed fewer items involving obvious pathology while anxious subjects behaved as if they had been "caught" describing themselves inaccurately on the first test.


Noting that men typically obtain higher Es scores than do women and previous explanations said that women had a general tendency to admit more pathology than men, this author showed that, in fact, a number of items on the scale seemed to measure sex role identification and this answer was just as credible. When tests were rescored with the items to which men and women responded differently eliminated the sex differences in Es were cancelled out. The omission of these items did not effect the Es scales efficacy in predicting response to and length of time spent in therapy.


The authors used a no test group, an innocuous test group, and an MMPI test group and found that the latter group exhibited more anxiety as a function of the test taking situation than either of the other two groups.


Noting that the Mf scale was intended to measure sexual inversion but that college males typically scored high, the author reported an item analysis of Mf scale responses of male and female college students. Significant differentiation was found in only 40 of the 60 Mf scale items, thus explaining the higher scores college men obtain.


In that both male the female college students tend to score significantly higher on the Pd scale than the norming population, the authors used an item analysis to establish separate college norms for the Pd scale. Need for new norms was shown by the fact that college males significantly differed from the normative group on 25 of the 50 scale items while college females differed from the normative group on 29 of the 50 items.
C. Studies of Change Over Occasions


Twenty-two male undergraduates in two groups, 11 who wanted to take LSD (E) and 11 who did not (C) were given a series of tests including the MMPI. Eight members of the E group were given LSD after the test session and retested at intervals of one week and at three months. Four E subjects took LSD again after the three month testing and were tested a week later.

A one way analysis of variance yielded a significant F across all test instruments showing a personality difference between those who want to take LSD and those who do not. The eight subjects who took LSD showed significant changes on the MMPI at the one week retest supporting the hypothesis that there are short term personality changes as a result of a single LSD experience. MMPI scales were not significantly different from the pre-experience scores on the three month retest.

Computer and Actuarial Applications


The author used multiple linear regression to develop weights for the MMPI scales then compared this formula to the ratings of six experienced clinicians. The formula was able to duplicate judges' decisions more reliably than the judges were able to duplicate their own decisions. Furthermore, the formula was more reliable than the inter-rate-agreement. Both of these factors indicate that the actuarial formula is more stable than the clinicians' ratings. The same results were not obtained when applied to a psychiatric population suggesting that the formula may work for nonpsychiatric populations but that clinicians' ratings may be superior for psychiatric populations.


This study set out to derive an actuarial formula for use with the MMPI in screening psychological disturbance in college males. With an N of 200, the derived formula correlated .91 with judge's ratings. In differentiating groups (validity) the formula was consistent with the judge's opinion 77.7% of the time.

The Mt scale of the MMPI has been shown to identify and/or predict maladjustment in college students. A computer program based on sequential decision rules has been designed to accomplish the same task. This study compared the two methods and found: 1) with a maladjusted group the Mt scale correctly identified 86 percent of the subjects while the computer program correctly identified 70.5 percent; 2) with an adjusted group the Mt scale correctly identified 90 percent of the subjects while the computer program correctly identified 72.3 percent of the subjects.


The author describes the development of a computer scoring and interpretation method that yields a narrative report similar in style and content to one written by a psychologist for college counseling use. The method not only saves clerical and professional time, but has many advantages in screening, referral, and as an aid to research.


This study attempted to apply two sets of rules for classifying MMPI patterns that were adapted with clinical populations to college student populations by use of a computer. Results indicated that only a small number of college cases met the criteria for classification in each system.


Decision rules for determining college student maladjustment were obtained by tape recording an experienced clinician "think out loud" when interpreting MMPI profiles. These rules were then flow charted and programmed. The computer program subsequently correctly identified maladjustment to a greater degree of precision than did the original clinician. The results remained stable over five cross validation studies. The flow chart is presented in the text.

MMPI profiles of five college samples were given to eight test interpreters as well as a computer. The task was to Q-sort the profiles into "least" and "most" adjusted categories. Results showed that the computer did as well as the best of the eight clinicians and better than the average.

Normative Studies


This is a short article providing normative data for Wiggens' 13 MMPI content scales: social maladjustment (SOC); depression (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). Whereas Wiggens used a sample size of 96, the norming group here consisted of 1538 male and 1173 female freshmen college students.


All freshmen entering the University of Alabama were required to take the MMPI yielding one of the largest single samplings to date (M = 1538, F = 1173). Results obtained were similar to previously published results with the following variations. In the scores presented in the Handbook females were shown higher on scale 5 (Mf) than was obtained in this study. Also, male scores on scales 3 (Hy) and 5 (Mf) were higher in the Handbook than were obtained in this study. The authors suggest a personality change of those going to college over the past decade. The article presents tables showing raw scores, T scores, and high points broken down by sex.

New Scales


A special scale was devised to discriminate probationary freshmen students who would be retained second semester from those who would be dismissed. Nineteen retained and 19 dismissed subjects were matched on several variables including measures of ability and GPA. The two groups did not differ significantly from each other on any of the existing clinical scales or on several existing experimental scales. A RD (retained-dismissed) score was developed from discriminating items and used in a cross validation study and found to discriminate at the .001 level.

In a previous study, Hackett found that correlations between academic achievement and MMPI scale scores were not high enough to be of value in predicting scholastic success. He did find that some items seemed to discriminate between high and low achievers. The present study identified these items and put them into a special scale (Z). Pearson product moment correlations between the Z scale and grade point average was found to be .61 which is superior to most ability tests (r between ACE and GPA = .39).

From an inspection of the items, the author made some tentative hypotheses about the personalities of high and low achievers. How achievers seem to be sensitive, emotionally responsive, view the world as hostile, and project a great deal. Hackett drew a parallel between this group and the "Authoritarian Personality." High achievers, on the other hand, project less, discriminate better, are more relaxed, and are more confident.


In an attempt to replicate the findings of Hackett (#48) with females and controlling for IQ, the author matched two groups of girls within three IQ points and administered the Z scale to them. The results failed to replicate Hackett's findings. Seegars suggests devising separate scales for different sub-populations, i.e. males, females, upperclassmen, etc., and further study to determine what the Z scale measures.