

Racial Bias in Prediction With the MMPI for a Juvenile Delinquent Population

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Relationships between MMPI scales and criteria were evaluated to determine if the MMPI is racially biased with a juvenile delinquent population. The MMPI was administered to 333 white and 107 Black male juvenile delinquents, and criterion data were collected. The regression equations developed for Blacks and whites resulted in similar accuracies. However, the weights of the regression equations tended to differ for the two races. How they differed depended on the criterion predicted by the equations. Consequently, it was impossible to state unconditionally that the use of the MMPI with Black delinquents will have an adverse impact. In fact, one interpretation of the results suggested that the MMPI may not be racially biased for predictions with juvenile delinquents because the amount of constant error in prediction for a racial group decreased toward zero as the apparent objectivity of the criteria increased.

The Minnesota Multiphasic Personality Inventory (MMPI) is used widely in decisions of clinical diagnosis and treatment, and for screening and selection among largely normal populations. However, little research has focused on whether the MMPI, which was developed almost entirely on a white, mid-western standardization sample, is a valid, unbiased measure for minority group members. This study was undertaken to understand the influence of race on the accuracy of MMPI interpretation with juvenile delinquents. The test bias issue is especially salient with this population in that Black Americans and other individuals who have low socioeconomic status are overrepresented in prison and detention facilities where psychological assessment, including the MMPI, is often used for prescribing placement and treatment.

Studies with various populations have demonstrated that there is no simple answer to the question, "Is the MMPI biased against Blacks?" Gynther and his associates (Gynther, 1972, 1979; Gynther, Fowler, & Erdberg, 1971; Gynther,

Lachar, & Dahlstrom, 1978) presented the view that the use of the MMPI may result in unfavorable and invalid decisions about Blacks. In reviewing the literature, Gynther and Green (1980) concluded that MMPI scores on scales *F*, *Sc*, and *Ma* are in general more elevated in the pathological direction for Blacks and that these differences exist for both deviant groups and normals. They argued that the results suggest that the MMPI may be biased. Specifically, given that normal Blacks are receiving higher scores, they are more likely to be incorrectly classified as abnormal.

An alternative position was presented by Pritchard and Rosenblatt (1980). They concluded that "there is little evidence that blacks in general score substantially higher or lower than whites in general on the MMPI scales" (p. 265), although certain types of Blacks and whites may differ. More important, they questioned the merit of studies that compare Black and white means on the MMPI to determine if it is biased. They argued that a difference in means is an ambiguous index of test bias in that it does not take into account the accuracy of the scales to predict criteria. They preferred an accuracy approach, which compares the relationships between MMPI scales and criteria for Blacks and whites; they found no evidence with this definition that the MMPI is biased. More recently some researchers have evaluated racial differences on such variables as ratings of family environment (Patterson, Charles, Woodward, Roberts, & Penk, 1981) and hospital chart information (Butcher, Braswell, & Raney, 1983), and used the results from these analyses to help explain differences among races on the MMPI. However, these researchers did not directly evaluate racial differences in the prediction of these variables from the MMPI, and, consequently, their results did not address bias using the accuracy approach, as suggested by Pritchard and Rosenblatt.

In summary, previous research with the MMPI has attempted almost exclusively to investigate the fair use of the MMPI without relating it to criterion information. The purpose of this study was to evaluate its fairness by comparing the prediction criteria from the MMPI for Black and white juvenile delinquents.

METHOD

Subjects

Three hundred thirty-three white and 107 Black male juvenile delinquents participated in this study. They resided for 3 weeks in a Diagnostic and Evaluation (D&E) Center after being committed to the state's Department of Youth Services, and were being evaluated in order to be placed appropriately within the state system. Twelve percent of the Black delinquents and the same percentage of white delinquents had committed serious offenses (e.g., armed robbery, assault, rape). Sixty-nine percent of the Black youths and 55% of the

white youths had committed less serious offenses (e.g., grand larceny, vandalism, possession of marijuana). Nineteen percent of the Black delinquents and 33% of the white delinquents were institutionalized for other reasons such as running away from home, truancy, or violation of probation. The percentage of Black and white youths who had committed at least one prior offense was 15 and 16, respectively. Both the Black and white subjects averaged 16 years of age. Their average full scale Wechsler IQs were 84.86 and 95.72 for Black and white youths, respectively. They had approximately the same number of years in school: 8.59 for Blacks and 8.49 for whites.

MMPI

The standard booklet (Form L) of the MMPI (Items 1–399) was administered and scored for both adult and adolescent norms. Adolescent norm conversion was done with tables from Marks, Seeman, and Haller (1974), and *K* was not added to adolescent profiles.

MMPIs were administered in small groups of two to six during the delinquents' first week at the D&E Center and prior to other testing procedures. Subjects were screened for their reading ability using the Test of Basic Adult Education. Only those who attained a sixth-grade reading level on this measure were administered the MMPI. The selection ratios using this cutoff score differed for the two racial groups: 60.5% for whites and 21.9% for Blacks.¹

Criterion Measures

The criterion measures were developed from three assessment procedures utilized at the D&E Center. These included staff ratings on a standard behavioral rating scale, three measures of behavior at the D&E Center, and three scales constructed from the interview conducted by psychology graduate students. This information is part of a larger set of data that is collected routinely to aid in prescribing placement and treatment plans.

¹Interpreting the results from this study would be problematical, to some extent, if Blacks and whites who read at the sixth-grade level differed on behavioral measures less (or more) than Blacks and whites who read at a lower level. Consequently, two-way analyses of variance were conducted. The two factors were race and reading level, and the dependent variables were number of prior offenses, seriousness of committing offenses, and the criterion variables (described in the next section). Although the youths who scored below the sixth-grade level did show significantly more deviant behavior on five of the nine measures, the differences between Blacks and whites did not differ on any of the measures significantly as a function of reading level. Given that the interactions were nonsignificant, the selection process did not appear to introduce any interpretational difficulties.

Behavior Problem Checklist. The Behavior Problem Checklist (BPCL) is a 55-item rating scale designed for an adult observer (generally a parent, teacher, or institutional staff member) to rate the behavior of children or adolescents on several different dimensions (Peterson, 1961; Quay, 1964, 1979; Quay & Parsons, 1972). Only the Conduct Problem (CP) scale was used in the present study. The remaining scales were not included because they contained some items which were inappropriate for the setting (e.g., "stays out late at night"), were not directly related conceptually to the scales of the MMPI, and/or had inadequate reliability.

The CP scale was completed on each delinquent by two dormitory counselors (staff) who interacted with the youths during their stay at the D&E Center. Checklists were completed during the third week, and the staff were instructed to make their ratings independently. They had no access to information on the psychological assessment, which included the MMPI and clinical interview, at the time the ratings were made. The majority of the staff members (approximately 70%) were Black.

Previous research at the center had determined interrater reliability on the CP scale to be .74 for two raters (Kelley, 1981). In addition, interrater reliability coefficients were computed using the rating data in this study; the computed reliabilities for two raters were .61 overall, .55 for the white delinquents, and .68 for Black delinquents.

Diagnostic and evaluation center behavior (D&E behavior). Standard data on each youth's progress through the token economy system at the D&E Center were recorded by the staff. Three measures were obtained:

1. Time in quiet room: The number of times a youth was put in the time-out room during his 3-week stay. Time-out was used for unmanageable, out-of-control behavior and for punishment of severe rule infractions.
2. Token economy level at discharge: Progress was represented by four privilege levels in a token economy with intake at Level 3, possible demotion to Level 4, and progress at Levels 2 and 1.
3. Token economy level on average: Privilege level within token economy was averaged across days that a youth resided in the center.

The correlations among these three measures as well as the CP scale ranged from .43 to .60 for the total sample, from .36 to .56 for the white delinquents, and from .50 to .75 for the Black sample. These results indicated relatively good convergence among the conduct disorder criteria.

Mental status examinations. As part of their psychological assessment, clinical psychology graduate students (psychology trainees) conducted a comprehensive interview and mental status exam. In contrast to the staff, the

majority of the psychology graduate students (approximately 90%) were white. Each youth was rated on 55 interview items using a 4-point scale, anchored by the following labels: *within normal limits*, *mild*, *moderate*, and *severe*. The mental status ratings included the usual symptoms of anxiety, depression, thought disorder, aggression, and special faculties covered in a psychiatric interview. These ratings were made without knowledge of the MMPI which was scored after the interview was completed. Selected items were summed together to create three scales: neurosis (8 items), psychosis (7 items), and conduct disorder (10 items).

Coefficient alphas were computed on the total sample for the neurotic, psychotic, and conduct disorder scales. They were .70, .75, and .70, respectively. The reliabilities on the neurotic and conduct disorder scales were within .05 of each other for the Black and white samples. However, the reliabilities on the psychotic scale differed markedly: .73 for the white delinquents and .48 for the Black delinquents.

Among the three mental status scales, the conduct disorder scale correlated highest with the other criteria, which also were supposed to assess the degree to which the delinquents had conduct problems. These correlations ranged from .19 to .24 for the total sample. The correlations of the two remaining mental status scales with the other criteria (BPCL and D&E behavior) were lower for the total sample: .01 to .03 for the neurotic scale and .01 to .10 for the psychotic scale. None of the correlations differed by more than .05 between the Black and white delinquents. These results support the construct validity of the criteria.

Statistical Analyses

Regression analyses were conducted to assess if different relationships for Blacks and whites existed between the MMPI and the various criterion measures. To avoid the excessive number of statistical tests which would result from all possible pairings of the 13 MMPI scales with the 7 criterion measures, only those pairings that merited a priori interest were considered. Therefore, MMPI scales *Hs*, *D*, *Hy*, and *Pt*, which are intended to assess depression, anxiety, and neurotic symptoms, were related to the psychology trainees' ratings of neurotic symptomatology on the mental status exam. MMPI scales *F*, *Pa*, *Sc*, and *Ma*, which generally measure psychotic symptoms, were related to the psychology trainees' ratings of psychotic symptomatology on the mental status exam. Finally, MMPI scales *Pd* and *Ma*, which are primary measures of antisocial behavior, were related to the three indices based on a youth's performance within the token economy system, staff ratings of CP on the BPCL, and the psychology trainees' ratings of conduct disorder symptomatology on the mental status exam. In total, 18 of the 91 possible relationships between 13 MMPI scales and 7 criteria were evaluated. These relationships were evaluated with both adolescent and adult norms.

The sample sizes varied across analyses. Statistics were calculated based on all data that were available for each predictor-criterion pair. For analyses that had as a criterion mental status ratings, the sample size remained constant for whites at 332, but the sample sizes varied from 105 to 107 for Blacks. For analyses using CP ratings by staff as a criterion, the sample sizes ranged from 281 to 286 for whites and from 90 to 94 for Blacks. The samples sizes differed quite dramatically across the remaining three criteria: time in quiet room, token economy level at discharge, and token economy level on the average. For Blacks, the sample sizes were 91, 84, 88, and 63, respectively. For whites, the sample sizes were 280, 247, 263, and 180 or 181 (depending on predictor), respectively.

RESULTS

Mean Differences²

Previous research on bias with the MMPI considered primarily differences in scale means for Blacks and whites. Consequently, these means were compared in this study. Black means (*B*) and white means (*W*) differed significantly at the .05 level on 8 of the 13 MMPI scales using the adult norms: *F* (*B* = 75.65, *W* = 66.51), *Hs* (*B* = 60.77, *W* = 56.49), *D* (*B* = 64.27, *W* = 61.11), *Pd* (*B* = 69.83, *W* = 73.14), *Mf* (*B* = 58.27, *W* = 55.67), *Pt* (*B* = 69.56, *W* = 65.19), *Sc* (*B* = 79.81, *W* = 71.41), and *Ma* (*B* = 72.32, *W* = 68.69). The means on the same eight scales differed significantly and in the same direction for the adolescent norms. However, with adolescent norms, the scale means for both races never exceeded a mean scale score of 63.

It is interesting to evaluate the mean differences on the criteria to determine if a similar pattern occurred for them. The three interview ratings by psychology trainees on neurosis, psychosis, and conduct disorder were higher for whites, which indicated greater pathology for them; however, only the mean ratings on conduct disorder differed significantly. Blacks and whites received almost identical means on the two token economy measures. For time spent in quiet room and the conduct disorder ratings by staff, Black delinquents had higher means. However, only the latter measure differed significantly. On the basis of these results, it is unclear which racial group of delinquents manifested greater pathology.

Differences in Indices of Personality

How well the various criteria were predicted from the MMPI scales for Blacks and whites was assessed using two statistics, correlations and mean square errors. The results for the MMPI scales using the adolescent norms are presented

²The means and standard deviations for the MMPI scales (scored using adult and adolescent norms) and criteria measures for the Black and white delinquents may be obtained by writing the first author.

in Table 1. In most cases, the correlations were low in magnitude, but significant. The differences in the correlations were not consistently in favor of either race, and only two of these differences were significant. The last column of Table 1 shows the results for the other index of predictability, the mean square error (MSE). Differences in MSEs were evaluated using a procedure by O'Brien (1981) to compare MSEs for factorial designs rather than using the traditional, but nonrobust *F* test (Jensen, 1980). The only two significant differences in MSEs indicated greater accuracy with the MMPI for the white subjects.

TABLE 1
Correlations Between Criteria and MMPI Scales Using Adolescent Norms for Black and White Delinquents and Differences in Predictability

Criteria	MMPI Predictor Scales	Correlations of MMPI With Criteria		Predictability Index Favors Blacks (B) or Whites (W)	
		Blacks	Whites	Correlation	MSE
Neurotic Ratings by					
Psychology	1	.33*	.28*	B	B
Trainee	2	.28*	.21*	B	B
	3	.24*	.19*	B	B
	7	.24*	.36*	W	B
	Average	.27	.26		
Psychotic Ratings by					
Psychology	F	.14	.26*	W	B
Trainee	6	.14	.17*	W	B
	8	.19*	.34*	W	B
	9	.10	.26*	W	B
	Average	.14	.26		
Conduct Disorder Ratings by					
Psychology	4	.22*	.25*	W	B
Trainee	9	.13	.26*	W	B
	Average	.18	.26		
CP Ratings by Staff					
	4	.37*	.11*	B*	W
	9	.22*	.27*	W	W*
	Average	.30	.19		
Time in Quiet Room					
	4	.37*	-.01	B*	B
	9	.21*	.09	B	B
Token Economy at Discharge					
	4	.30*	.18*	B	W
	9	.11	.24*	W	W*
Token Economy on Average					
	4	.34*	.20*	B	W
	9	.24*	.35*	W	W
	Average	.27	.20		

* $p < .05$.

The results for the two indices of predictability frequently conflicted. The one index, the MSE, is a function of both the criterion variance and the second index, the correlation between a predictor and criterion. The correlations for the two races did not differ greatly across the various MMPI scales and criteria, whereas criterion variances did. In fact, whichever racial group had the larger criterion variance always had the larger MSE.

The results with the adult norms were very similar; therefore, they are not presented in tabular form. The only differences in the significance tests were that three rather than two significant differences were found with the MSE. The additional significant difference was for the relationship between the MMPI *Pd* scale and the CP ratings by staff, which showed greater predictability for whites.

Differences in Regression Weights

The two regression equations for each predictor-criterion pair were compared in terms of their slopes and intercepts to see if the same equation was appropriate for both racial groups. In order to make these comparisons, each criterion was regressed on three variables: an MMPI scale, a dummy-coded variable to differentiate between Blacks and whites, and the interaction between these two variables. Slope differences were evaluated by determining if the interaction term contributed significantly over and above the other two variables. Intercepts were compared by determining if the race variable contributed significantly over and above the MMPI scale. Proportions of criterion variance accounted for by slope differences, intercept differences, and MMPI scales disregarding race were computed to determine their relative importance. The results from these analyses using the MMPI adolescent norms are summarized in Table 2.

The Black and white regression equations differed in slope for 3 of the 18 predictor-criterion pairs (column 3) and in intercept for 9 of the 18 pairs (column 2). In comparison with the variance accounted for by the MMPI scales alone (column 1), the variance accounted for by the intercept and slope differences were on the average somewhat smaller. The results of the significance tests with adults norms were identical to those for the adolescent norms.

These results indicated that different regression equations are appropriate for a number of the predictor-criterion pairs. In order to understand the implications of the results, a direct test was made to determine if a regression equation derived on a white sample would significantly underpredict or overpredict the criterion scores for the Black sample. In order to make this test, criterion scores for Blacks were predicted using the regression equation derived on the white youths. Next, differences between the actual criterion scores and the predicted criterion scores were computed for each Black subject. An *F* test was then calculated to determine if the mean of these residual scores was significantly different from zero. A comparable analysis was made to determine if a regression equation derived on a Black sample would significantly underpredict or

TABLE 2
 Proportion of Criterion Variance Associated With MMPI, With Race Over and Above
 MMPI, With Race \times MMPI, and With All Three Sources Using Adolescent MMPI Norms

Criteria	MMPI Predictor Scales	Predictor(s) in Regression Equation		
		MMPI Scale	Race Over MMPI	MMPI \times Race
Neurotic Ratings by				
Psychology	1	.076*	.013*	.000
Trainee	2	.042*	.009*	.002
	3	.039*	.004	.000
	7	.108*	.010*	.001
	Average	.066	.009	.001
Psychotic Ratings by				
Psychology	F	.045*	.014*	.009*
Trainee	6	.025*	.005	.001
	8	.090*	.011*	.007
	9	.051*	.009*	.004
	Average	.053	.010	.005
Conduct Disorder Ratings by				
Psychology	4	.064*	.005	.000
Trainee	9	.050*	.014*	.004
	Average	.057	.010	.002
CP Ratings				
by Staff	4	.027*	.039*	.024*
	9	.076*	.022*	.001
	Average	.052	.030	.012
Time in				
Quiet Room	4	.005	.003	.029*
	9	.015*	.001	.005
Token Economy				
at Discharge	4	.044*	.000	.007
	9	.043*	.002	.000
Token Economy				
on Average	4	.052*	.006	.008
	9	.106*	.000	.000
	Average	.045	.002	.008

* $p < .05$.

overpredict the criterion scores for the white sample. The results of these analyses are presented in Table 3.

For 14 of the 18 predictor-criterion pairs with adolescent norms, significant underprediction or overprediction of criteria occurred. Fewer significant findings were found for D&E behaviors. Also, the results appeared to differ depending on whether the judgments were made by the psychology trainees (the

TABLE 3
Underprediction (U) or Overprediction (O) Resulting From Using a Regression Equation
Derived on Other Racial Group

Criteria	MMPI Scales	Adolescent Norms		Adult Norms	
		Blacks	Whites	Blacks	Whites
Neurotic Ratings by					
Psychology	1	O*	U*	O*	U*
Trainee	2	O*	U*	O*	U*
	3	O	U*	O	U*
	7	O*	U*	O*	U*
Psychotic Ratings by					
Psychology	F	O*	U*	O*	U*
Trainee	6	O*	U*	O*	U*
	8	O	U*	O*	U*
	9	O*	U*	O*	U*
Conduct Disorder Ratings by					
Psychology	4	O*	U*	O*	U*
Trainee	9	O*	U*	O*	U*
CP Ratings by Staff					
	4	U*	O*	U*	O*
	9	U*	O*	U*	O*
Time in Quiet Room					
	4	U*	O*	U	O*
	9	U	O	U	O*
Token Economy at Discharge					
	4	U	U	O	U
	9	U	O	U	O
Token Economy on Average					
	4	U	O*	U	O*
	9	U	O	U	O

Note. Overprediction means that the regression equation yielded predicted criterion scores, which suggested more pathology than the actual criterion indicated. Underprediction means regression equation suggested less pathology than criterion indicated.

* $p < .05$.

three mental status scales) or by the staff (all others). In particular, when staff judgment scores for Blacks were predicted using regression equations derived on whites, the predicted scores were lower than the actual staff judgment scores (underprediction). On the other hand, when staff judgment scores for whites were predicted using regression equations derived on Blacks, the predicted scores were higher than the actual staff judgment scores (overprediction). With psychology trainees' ratings as criteria, the opposite pattern was found: The Black regression equations tended to underpredict whites, whereas the white regression equations tended to overpredict Blacks.

DISCUSSION

The purpose of this research was to evaluate whether psychologists were likely to make equally fair decisions for Black and white juvenile delinquents with the

MMPI. A logical first step (Bartlett, Bobko, Mosier, & Hannan, 1978) in this evaluation was to determine if the MMPI related significantly to the criteria overall. Previous researchers had found statistically significant, but relatively weak relationships between MMPI scales and criteria (Hedlund, 1977). In this study, the relationships between MMPI scales and criteria were evaluated both within each racial group and for all subjects disregarding their race. The magnitude of the resulting correlations was generally similar to those found by previous researchers (i.e., small, but significant). The relationships between MMPI scales and criteria were judged to be of sufficient magnitude to evaluate them for racial bias.

In the literature, the analytical result used most frequently to determine if the MMPI is biased has been differences in scale means between Blacks and whites. In agreement with previous studies (Gynther & Green, 1980), Blacks tended to score higher than whites on most of the MMPI scales, with the largest differences on scales *F*, *Sc*, and *Ma*. However, whites did score higher than Blacks on *Pd*. Consequently, according to a mean-difference definition of bias, a number of the MMPI scales would be judged as biased against Blacks, and the Psychopathy scale would be evaluated as biased against whites. However, Pritchard and Rosenblatt (1980), and Gynther and Green agreed that Black-white differences in scale means do not necessarily imply that a measure is biased.

In general, the predictability of the criteria—the correlations and the MSE—did not differ markedly for Blacks and whites. A greater number of differences was found when evaluating the weights of the regression equations. For about half of the relationships, differences were found; most of them were with the intercept term, which indicated bias in prediction. The amount of under- or overprediction that resulted from applying one racial group's regression equation to the MMPI scores for the other group varied systematically with who made the criterion judgments. The regression equation derived on whites predicted for Blacks greater psychopathology than the ratings by the psychology trainees actually indicated. In contrast, the regression equation derived on Blacks predicted for whites greater psychopathology than the judgments by the staff (including the D&E behaviors administered by the staff). These results might have occurred because psychology trainees and staff may evaluate psychopathology and conduct disorder behavior differently for Black and white delinquents. For example, it seems quite possible that the psychology trainees, who were almost exclusively white, might have been more lenient in judging Black delinquents in comparison with white delinquents.

The racial composition of the groups of individuals making the criteria judgments differed and may explain differences in regression equations for Black and white delinquents. In addition, the criteria differ in terms of their subjectivity. The D&E behaviors are based on specific, well-defined behaviors, and are therefore, probably more objective than the other criteria and less vulnerable to racial bias. As shown in Table 2, the proportion of variance accounted for by the intercept differences (column 2) in comparison with the other sources is least

with the D&E behaviors. These results suggested that the MMPI might not be biased because the amount of under- or overprediction decreased toward zero as the apparent objectivity of the criteria increased.

It is impossible to state unconditionally that the use of the MMPI with Black delinquents will or will not have an adverse impact. It depends to a large extent on which criteria are more accurate. In other words, the fairness of the ratings must be called into question. It is much easier to understand why ratings might vary due to the race of the ratee than it is to explain why the MMPI might be biased. Consequently, future research must evaluate possible bias in not only the MMPI, but also in our traditional criterion, the rating.

REFERENCES

- Bartlett, C. J., Bobko, P., Mosier, S. B., & Hannan, R. (1978). Testing for fairness with a moderated regression strategy: An alternative to differential analysis. *Personnel Psychology, 31*, 233-241.
- Butcher, J. N., Braswell, L., & Raney, D. (1983). A cross-cultural comparison of American Indian, black, and white inpatients on the MMPI and presenting symptoms. *Journal of Consulting and Clinical Psychology, 51*, 587-594.
- Gynther, M. D. (1972). White norms and black MMPIs: A prescription for discrimination? *Psychological Bulletin, 78*, 386-402.
- Gynther, M. D. (1979). Ethnicity and personality: An update. In J. N. Butcher (Ed.), *New developments in the use of MMPI*. Minneapolis: University of Minnesota.
- Gynther, M. D., Fowler, R. D., & Erdberg, P. (1971). False positives galore: The application of standard MMPI criteria to a rural, isolated, Negro sample. *Journal of Clinical Psychology, 27*, 234-237.
- Gynther, M. D., & Green, S. B. (1980). Accuracy may make a difference, but does a difference make for accuracy?: A response to Pritchard and Rosenblatt. *Journal of Consulting and Clinical Psychology, 48*, 268-272.
- Gynther, M. D., Lachar, D., & Dahlstrom, W. G. (1978). Are special norms for minorities needed? Development of an MMPI F scale for blacks. *Journal of Consulting and Clinical Psychology, 46*, 1403-1408.
- Hedlund, J. L. (1977). MMPI clinical scale correlates. *Journal of Consulting and Clinical Psychology, 45*, 739-750.
- Jensen, A. R. (1980). *Bias in mental testing*. New York: Free Press.
- Kelley, C. K. (1981). Reliability of the Behavior Problem Checklist with institutionalized male delinquents. *Journal of Abnormal Child Psychology, 9*, 243-250.
- Marks, P. A., Seeman, W., & Haller, D. L. (1974). *The actuarial use of the MMPI with adolescents and adults*. Baltimore: Williams & Wilkens.
- O'Brien, R. G. (1981). A simple test for variance effects in experimental designs. *Psychological Bulletin, 89*, 570-574.
- Patterson, E. T., Charles, H. L., Woodward, W. A., Roberts, W. R., & Penk, W. E. (1981). Differences among black and white alcoholics. *Journal of Consulting and Clinical Psychology, 49*, 488-490.
- Peterson, D. R. (1961). Behavior problems of middle childhood. *Journal of Consulting and Clinical Psychology, 25*, 205-209.
- Pritchard, D. A., & Rosenblatt, A. I. (1980). Racial bias in the MMPI: A methodological review. *Journal of Consulting and Clinical Psychology, 48*, 263-267.

- Quay, H. C. (1964). Dimensions of personality in delinquent males as inferred from factor analysis ratings. *Journal of Research in Crime and Delinquency*, 1, 33-37.
- Quay, H. C. (1979). Classification. In H. C. Quay & V. S. Werry (Eds.), *Psychopathological disorder of childhood* (2nd ed., pp. 1-39). New York: Wiley.
- Quay, H. C., & Parsons, C. B. (1972). *The differential behavioral classification of the juvenile offender* (2nd ed.). Washington, DC: U.S. Bureau of Prisons.

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