

# Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) Predictors of Police Officer Problem Behavior and Collateral Self-Report Test Scores

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The current study examined the predictive validity of Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008/2011) scores in police officer screenings. We utilized a sample of 712 police officer candidates (82.6% male) from 2 Midwestern police departments. The sample included 426 hired officers, most of whom had supervisor ratings of problem behaviors and human resource records of civilian complaints. With the full sample, we calculated zero-order correlations between MMPI-2-RF scale scores and scale scores from the California Psychological Inventory (Gough, 1956) and Inwald Personality Inventory (Inwald, 2006) by gender. In the hired sample, we correlated MMPI-2-RF scale scores with the outcome data for males only, owing to the relatively small number of hired women. Several scales demonstrated meaningful correlations with the criteria, particularly in the thought dysfunction and behavioral/externalizing dysfunction domains. After applying a correction for range restriction, the correlation coefficient magnitudes were generally in the moderate to large range. The practical implications of these findings were explored by means of risk ratio analyses, which indicated that officers who produced elevations at cutscores lower than the traditionally used 65 *T*-score level were as much as 10 times more likely than those scoring below the cutoff to exhibit problem behaviors. Overall, the results supported the validity of the MMPI-2-RF in this setting. Implications and limitations of this study are discussed.

*Keywords:* MMPI-2-RF, police candidates, public safety screening, personnel selection, range restriction, preemployment evaluations

*Supplemental materials:* <http://dx.doi.org/10.1037/pas0000041.supp>

Although the majority of police officers perform their jobs in an effective and ethical manner, infrequent incidents of police officer misconduct significantly affect public safety and perceptions of the police force as a whole (Bradford, Jackson, & Stanko, 2009; Carr, Napolitano, & Keating, 2007; Mastrofski, Reisig, & McCluskey, 2002; Mazerolle, Bennett, Antrobus, & Eggins, 2012). For this reason, the screening process for police officers is substantially

more involved than in other personnel selection settings, with the majority of departments requiring a test of mental ability, a background investigation, an oral interview, and a psychological evaluation including psychological testing (Cochrane, Tett, & Vandecreek, 2003). The most recent national survey of state and local law enforcement agencies conducted by the Bureau of Justice Statistics (2010) indicates that, nationally, 72% of all police de-

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Gary L. Fischler is a paid Advisory Board Member of the Minnesota Multiphasic Personality Inventory (MMPI) publisher, the University of Minnesota Press. Yossef S. Ben-Porath and David M. Corey receive

research funds from the Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) publisher, and, as coauthors of the MMPI-2-RF Police Candidate Interpretive Report, they receive royalties on sales of the report. Yossef S. Ben-Porath is a paid consultant to the MMPI publisher, the University of Minnesota, and its distributor, Pearson. As coauthor of the MMPI-2-RF, he receives royalties on sales of the test.

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partments require a psychological evaluation to screen police applicants, and it is required in more than 98% of departments serving 25,000 residents or more.

Cochrane et al. (2003) surveyed police departments and found that the most commonly used psychological test in police officer screenings was the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher et al., 2001). The test has been widely researched in this setting, with a number of studies supporting the validity of original Minnesota Multiphasic Personality Inventory (MMPI) Clinical Scale scores in police screenings (Azen, Snibbe, & Montgomery, 1973; Bartol, 1982, 1991; Blau, Super, & Brady, 1993; Boes, Chandler, & Timm, 1997; Brewster & Stoloff, 1999; Cortina, Doherty, Kaufman, & Smith, 1992; Hiatt & Hargrave, 1988; Ones, Viswesvaran, Cullen, Drees, & Langkamp, 2003; Scogin, Schumacher, Gardner, & Chaplin, 1995; Sellbom, Fischler, & Ben-Porath, 2007; Weiss, Davis, Rostow, & Kinsman, 2003). However, these measures have remained essentially unchanged since they were first introduced by Hathaway and McKinley (1943), despite having long recognized psychometric limitations (cf. Loevinger, 1972; Meehl, 1972; Norman, 1972). Tellegen et al. (2003) developed the Restructured Clinical (RC) Scales to address these limitations. Sellbom et al. (2007) demonstrated that the psychometrically enhanced RC Scales have improved predictive validity in assessments of male police officers, a finding that converges with studies from other settings (Arbisi, Sellbom, & Ben-Porath, 2008; Ben-Porath & Tellegen, 2008; Forbey & Ben-Porath, 2007; Handel & Archer, 2008; Sellbom, Ben-Porath, Baum, Erez, & Gregory, 2008; Sellbom, Graham, & Schenk, 2006; Wallace & Liljequist, 2005).

Sellbom and colleagues (2007) found statistically significant zero-order correlations that ranged in magnitude from .15 to .19 between MMPI-2 Clinical Scale scores and future problems such as deceptiveness, conduct unbecoming, and inappropriate sexual attitudes. However, results for the RC Scales were more robust, as the correlational magnitudes ranged from .15 to .29 with similar problems, as well as citizen complaints, internal affairs complaints, involuntary departure, and other negative outcomes. RC Scales RC4 (Antisocial Behavior) and RC9 (Hypomanic Activation), which measure externalizing problems, and RC6 (Persecutory Ideation) and RC8 (Aberrant Experiences), which measure thought dysfunction, showed the strongest associations. The practical implications of their findings were illustrated through use of relative risk ratios (RRRs), which quantified the risk for negative outcomes at various *T*-score cutoffs. The authors found that a cutoff of 55T, which is approximately one standard deviation below the traditionally used cutoff of 65T, was the most effective in identifying risk for negative outcomes.

In addition to demonstrating the psychometric improvements afforded by the RC Scales, Sellbom et al. (2007) discussed how range restriction attenuates zero-order correlation coefficients between MMPI-2 scale scores and extratest criteria. Range restriction refers to the statistical phenomenon whereby correlation coefficients are diminished as a function of decreased variance.

In this setting, range restriction results from three primary factors: self-selection, preselection, and selection (see Figure 1 for hypothetical examples). Self-selection occurs before the application process, such that only individuals with the requisite interest and motivation attempt to become police officers. Though the psychological characteristics of the initial applicant pool are unknown, the potential responsibilities of a police officer may mo-

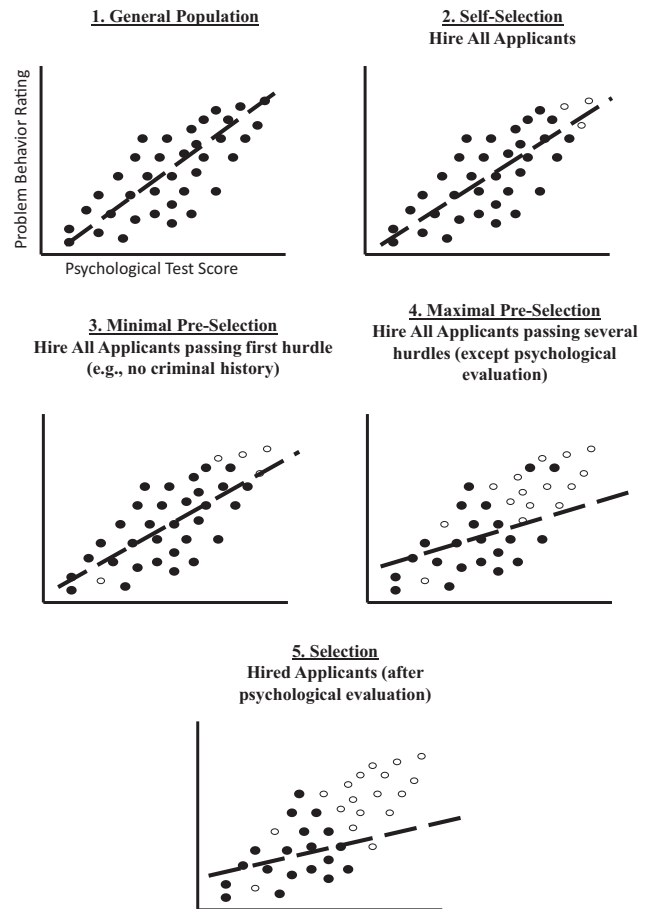


Figure 1. Hypothetical examples of range restriction resulting from self-selection, preselection, and selection factors.

tivate or dissuade individuals with certain types of psychological characteristics to seek employment as a police officer. However, because estimates of the initial police applicant pool's psychological characteristics are not available, we assume (for the purpose of some of our calculations described later) that this subpopulation is similar to the general population.

In the context of pre-employment psychological evaluations, preselection occurs during the application process, but before the psychological evaluation. Factors influencing preselection can include background investigations, medical exams, interviews, drug testing, polygraph testing, civil service exams, recommendation letters, police academy performance, physical fitness tests, and other considerations. Because the amount of preselection varies substantially across police departments (Cochrane et al., 2003), the psychological characteristics of the remaining applicant pool are also likely to vary. As presented in Figure 1, if preselection was minimal, the resulting applicant pool would closely resemble the initial applicant pool, whereas the introduction of significantly more preselection factors (i.e., "hurdles") would likely lead to a substantially more well-adjusted pool of applicants.

Range restriction due to selection factors is related to the use of testing (such as the MMPI-2-Restructured Form: MMPI-2-RF) in psychological evaluations to help identify candidates unsuitable

for employment. Depending on the number and nature of the hurdles that preceded the evaluation, the psychological characteristics of those ultimately hired after clearance by a psychologist who relied, in part, on the MMPI-2-RF may differ significantly from all individuals who were evaluated (see Figure 1).

Sellbom et al. (2007) illustrated that it is possible to disattenuate zero-order correlation coefficients for range restriction using formulas derived by Hunter and Schmidt (2004). Applying these formulas, they found that disattenuated correlation coefficients with extratest criteria reached moderate to large effect sizes, despite marginal to small uncorrected zero-order associations. This approach has been used in other investigations as well (Lowmaster & Morey, 2012; Tarescavage, Corey, & Ben-Porath, 2014).

The Hunter and Schmidt (2004) formula assumes a linear association between variables and requires three pieces of information: (a) the zero-order correlation coefficient between the MMPI-2-RF scale score and criterion, (b) the standard deviation of the MMPI-2-RF scale score in the sample, and (c) the nonrange restricted standard deviation of the MMPI-2-RF scale score. Though (a) and (b) are observable, (c) is estimated from a target group, such as those presented in the third and fourth examples in Figure 1. Sellbom and colleagues (2007) presented two sets of disattenuated correlations using two target groups similar to these examples. For instance, they reported that the zero-order correlation coefficient between RC6 and involuntary departure was found to be .15 among male police officers. The standard deviation for RC6 scores was 5.3 in the overall evaluated sample and 4.3 in the hired subsample for which involuntary departure was possible. Applying the Hunter and Schmidt (2004) formula using 5.3 as the nonrange restricted standard deviation yielded a corrected correlation coefficient of .18. This estimate would apply to police departments where candidates are heavily preselected (see example four in Figure 1), such as the one used to collect the Sellbom and colleagues (2007) sample. However, as noted earlier, the amount of preselection varies across police departments, with smaller police departments typically utilizing the least amount of preselection (Cochrane et al., 2003). Using the general population standard deviation of 10 as the nonrange restricted estimate, Sellbom and colleagues (2007) found that the corrected correlation coefficient was .33. This estimate would apply to police departments with minimal preselection, such as example three in Figure 1. Thus, the validity of MMPI-2-RF scale scores in this setting can be conceptualized as a range of values, such that lower correlational magnitudes apply to sites with greater amounts of preselection and higher correlational magnitudes apply to sites with less stringent preselection. In the example just cited, we would infer that the validity of RC6 as a predictor of subsequent involuntary departure ranges from .15 (no correction) to .33 (correction based on general population).

### Current Study

After publication of the Sellbom et al. (2007) findings, an updated version of the MMPI-2, the MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011), was released. We sought to extend the findings of Sellbom et al. (2007) to the entire MMPI-2-RF with a larger sample and additional criteria. Specifically, we calculated zero-order correlations for all MMPI-2-RF Substantive Scale scores in an augmented and larger sample that included additional

data obtained at a different site. We also calculated zero-order correlations with other self-report measures used widely in police officer screenings, and the larger sample also enabled us to include female police candidates in some of the analyses, neither of which Sellbom et al. (2007) provided. Based on the findings of Sellbom and colleagues (2007), we expected that scale scores from the behavioral/externalizing dysfunction and thought dysfunction domains of the test (including the Higher-Order and Specific Problems Scales, which aid in interpretation of the RC Scales) would show the most robust associations with criteria.

Because we expected the sample to produce meaningfully lower and less variant scores than the general population, we calculated range restriction-corrected correlation coefficients in the same manner as Sellbom et al. (2007). However, because the sample was heavily preselected, we expected zero-order correlations to closely approximate disattenuated correlations calculated using standard deviations from the overall evaluated sample as estimates of non-range restricted standard deviations. In fact, Sellbom and colleagues (2007) found marginal differences between zero-order correlations and disattenuated correlations corrected in this manner. For this reason, we only calculated corrected correlations using the general population standard deviation of 10, which would provide the upper-range validity estimate, applicable to sites with minimal preselection.

We also examined the practical utility of the correlational findings by calculating RRRs for statistically significant zero-order correlation coefficients using the traditional cutoff of 65T, as well as cutoffs of 60T, 55T, 50T, and 45T. Though the latter cutoffs are substantially lower than the ones used to assess for psychopathology in clinical settings, we expected that they would produce meaningful results while maintaining reasonable selection ratios (i.e., the proportion of individuals who score at or above the designated cutoff) because of the previously discussed range restriction and lower scores typically observed in this setting.

## Method

### Participants

The sample included 712 police officer candidates (82.6% male) who were administered the MMPI-2 during pre-employment psychological evaluations at police departments in Minnesota (72.8% of sample) or Kansas. The vast majority of these assessments were conducted prior to addition of the RC Scales to the MMPI-2. The MMPI-2-RF was scored from MMPI-2 responses, a method that yields scores comparable to those obtained from the MMPI-2-RF booklet (Tellegen & Ben-Porath, 2008/2011; van der Heijden, Egger, & Derksen, 2010). Only one candidate was excluded due to invalid responding on the MMPI-2-RF, yielding a final sample of 711 candidates meeting all Validity Scale criteria (Cannot Say: <18; Variable Response Inconsistency: <80; True Response Inconsistency: <80; Infrequent Responses: <120; and Infrequent Psychopathology Responses: <100; Ben-Porath & Tellegen, 2008/2011). Participants ranged in age from 18 to 58 years ( $M = 30.0$ ,  $SD = 15.8$ ). Additional demographic information was unavailable for the Kansas candidates, but the officers from Minnesota ranged in years of education from 12 to 19 years ( $M = 15.2$ ,  $SD = 1.1$ ) and were typically White (85.6%), with the remaining

coming from Asian American (5.9%), African American (4.9%), or Hispanic (2.2%) ethnic backgrounds.

Overall, 426 of these candidates (59.8%) were hired. This subsample was predominantly male (81.9%) and ranged in age from 18 to 56 years ( $M = 29.4$ ,  $SD = 1.1$ ). The hired officers from Minnesota ranged in education from 12 to 19 years ( $M = 15.2$ ,  $SD = 1.1$ ) and were primarily White (86.4%), although Asian Americans (6.1%), African Americans (4.3%), and Hispanics (2.3%) were also represented. There were no statistically significant demographic differences between the candidate and hired samples.

## Measures

**MMPI-2-RF.** The MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011) is a 51-scale measure of personality and psychopathology with 338 items. Nine scales are measures of the validity of a test-taker's responses. These scales assess for noncontent-based invalid responding (e.g., nonresponding, random responding, and acquiescent responding) and content-based invalid responding (e.g., overreporting and underreporting). The other 42 scales are organized hierarchically. They measure a broad range of clinically relevant psychological constructs. Psychometric features of the test (including reliability, descriptive findings, and empirical correlates) are documented in its technical manual (Tellegen & Ben-Porath, 2008/2011). The restructuring effort also focused on linking the MMPI-2-RF scales to current models and concepts in the fields of personality and psychopathology (Ben-Porath, 2012).

**Employee survey (ES).** The ES was comprised of 28 supervisor ratings of police officer performance and problem behaviors after being hired. Items were rated on four-point Likert scales ranging from no problem to severe problem. Nine variables from the ES were excluded from analyses due to low base rates of problem behavior (<1.5%), including inappropriate sexual relationships, financial/gambling problems, involvement in civil litigation, unlawful activity, alcohol abuse, substance abuse, using position for personal advantage, accepting gratuities, and showing bias toward others.

**Internal affairs (IA) complaints.** IA records were available only for the officers from Minnesota. They were coded for complaint severity and outcome (i.e., sustained or not). Information from these records was used to generate two dichotomous variables: severe IA complaint and sustained severe IA complaint. Overall, 22 officers (11.1%) had sustained IA complaints and 10 (5.3%) had sustained severe IA complaints. We created two dichotomous variables using this information, which compared these officers to 177 officers with no reported behavioral problems on the ES, as well as no reported history of IA complaints or Civilian Review Authority (CRA) complaints (described next).

**Civilian Review Authority (CRA) complaints.** The CRA was a committee established by the city council from the Minnesota police department jurisdiction. It was designed to provide citizens with an outlet to voice complaints about police officers. Overall, 26 officers (12.8%) had CRA complaints. We used this information to create a dichotomous variable that compared these officers to 177 officers with no reported behavioral problems on the ES or history of IA/CRA complaints.

**Involuntary departure.** Human resource files for the officers from Minnesota were used to identify those involuntarily separated

under unfavorable circumstances. Overall, 13 officers (6.8%) were either fired or asked to resign. As with the previously described variables, we created a dichotomous variable that compared these officers to the 177 officers with no reported behavioral problems on the ES or history of IA/CRA complaints.

**Psychologist recommendation.** The evaluating psychologists for the officers in the Minnesota sample provided a decision to the police department of recommended (64.2%), marginally recommended (11.6%), and not recommended (24.3%). This variable was coded on a 0 to 2 scale, with higher scores indicating a marginal to poor recommendation.

**California Psychological Inventory.** The California Psychological Inventory (CPI; Gough, 1956) is a 434-item self-report measure of normal personality with true-false response options. The test was predated and influenced by the original MMPI (Hathaway & McKinley, 1943). It has 20 primary scales measuring common personality constructs, but it is possible to generate a specialized Police and Public Safety Selection Report that includes scales intended to identify risk for problem behaviors relevant to the responsibilities of a police officer. The development and psychometric features of these scales are documented in the technical manual for the report (Roberts & Johnson, 2001). The specialized scales provide risk estimates for the following problems: job performance, integrity, anger management, alcohol use, illegal drug use, substance abuse proclivity, probability of involuntary departure, and probability of being rated poorly suited by police psychologists. In the current study, CPI data were available only for the Minnesota candidates.

**Inwald Personality Inventory.** The Inwald Personality Inventory (IPI; Inwald, Knatz, & Shusman, 1982) is a 310-item true-false measure of personality characteristics and behaviors relevant to public safety officer selection. The test has 26 scales, the psychometrics of which are documented in the test technical manual (Inwald, 2006). According to a survey by Cochrane et al. (2003), the IPI is the fourth most commonly used test in police officer screenings behind the MMPI-2, CPI, and 16 Personality Factor Questionnaire (Cattell, Eber, & Tatsuoka, 1988), respectively. In this study, the IPI was available only for the Kansas candidates.

## Procedures

Psychological evaluations of police officer candidates were conducted as part of the standard hiring protocols in each department after a conditional offer of employment. The evaluation included the just described self-report psychological tests, a clinical interview, and a review of personal history information. Prior to this evaluation, police applicants were excluded based on the results of written examinations, oral board interviews, and polygraph exams, as well as a background investigation of their criminal activity, driving record, and employment history. Candidates at the police department in Minnesota were also required to pass a physical agility test. The Employee Survey was only completed for research purposes. The investigation was approved by an Institutional Review Board as an archival study.

## Data Analyses

To investigate the response style and clinical characteristics of the sample, mean scale scores and standard deviations for the



MMPI-2-RF Validity and Substantive Scales were computed for the hired and not hired samples by gender. These statistics were compared to the MMPI-2-RF Technical Manual Law Enforcement Officer comparisons groups (Tellegen & Ben-Porath, 2008/2011). We were interested in identifying any meaningful gender differences, as well as differences between the not hired, hired, and comparison group samples. Gender differences are useful for describing sample characteristics, differences between the not hired and hired samples enable an investigation of the impact of selection factors, and differences from the comparison group yield information relevant to how the current sample's level of psychopathology and defensive responding compare with other samples of police officers. We also sought to compare mean scale scores with the normative sample, which by definition produces mean *T* scores of 50 and standard deviations of 10 for all scales. Following convention (Graham, 2012), we defined a meaningful difference as 5 *T*-score points or greater, which amounts to at least one half standard deviation in the general population.

To examine the validity of MMPI-2-RF scale scores in this setting, we calculated zero-order correlations between MMPI-2-RF scale scores and the ES, CPI, and IPI by gender. Because of relatively small sample sizes for some criteria in the female group, we only calculated correlation coefficients with the CPI for women. We also calculated range-restriction corrected correlation coefficients based on formulas derived by Hunter and Schmidt (2004), which were discussed earlier.

To investigate the practical utility of the correlational findings, we calculated relative risk ratios using cutoffs of 65T, 60T, 55T, 50T, and 45T. RRRs are calculated by dividing the risk of a negative outcome for individuals who score at or above the cutoff by the risk of a negative outcome for individuals who score below the cutoff. We also calculated 95% confidence intervals for the relative risk ratios. Confidence intervals that overlap with the value 1.0 indicate nonsignificant findings. We only calculated relative risk ratios for scales that were significantly correlated with study variables from the ES, complaints, and involuntary departure criteria. Because the ES criteria are not dichotomized, we generated a dichotomous variable for each ES criterion comparing those rated as having problems versus those who were rated as having no problems. Only RRRs that yielded selection ratios between 3.0% and 20% were calculated in order to reduce the respective possibilities of outliers affecting the results and false positives.

## Results

### Descriptive Findings

MMPI-2-RF scale score means and standard deviations are reported in Table 1 by gender for the hired and unhired along with the MMPI-2-RF Law Enforcement Officer comparison group. Overall, there was only one meaningful difference between genders in our samples (defined as a difference of 5 or more *T*-score points): The hired men scored approximately 5 points higher on Disconstraint (DISC-r) than the hired women. No other meaningful differences were observed between hired and not hired men or women. However, several meaningful differences were observed for both the unhired and hired samples of men and women in comparison to the MMPI-2-RF normative sample averages (which, by definition, are 50T for all scales). Men and women scored

meaningfully lower than the normative sample on the majority of scales. Exceptions included TRIN-r, L-r, BXD, RC4, GIC, SUI, SUB, JCP, AGGR-r, DISC-r, and INTR-r (see Table 1 for scale names). Both hired men and women in this sample scored meaningfully higher than the normative sample on the underreporting scale Adjustment Validity (K-r). As expected, the samples produced a reduced range of scores, as the median standard deviation was five (i.e., half of the population standard deviation of 10) in all samples except the unhired males, which had a median standard deviation of six.

### Correlations

Interpreted zero-order and disattenuated (for preselection) correlations between MMPI-2-RF substantive scales and ES, complaint, and involuntary departure criteria in the male sample are summarized in Table 2. The full correlational tables for these analyses, in addition to all zero-order and disattenuated correlations between MMPI-2-RF scales and self-report criteria for both men and women, are presented in Supplementary Tables 1–5 online. In order to facilitate interpretation, the findings are summarized in reference to each of the five MMPI-2-RF domains, which include (a) Emotional Dysfunction, (b) Thought Dysfunction, (c) Behavioral Dysfunction, (d) Somatic/Cognitive Complaints, and (e) Interpersonal Functioning. All scale abbreviations are defined in Table 1. To further assist with interpretation, only statistically significant associations with ES and chart review criteria are interpreted, as are statistically significant correlation coefficients reaching a magnitude of  $r \geq |.40|$  between the MMPI-2-RF scale scores and the CPI specialized law enforcement scale scores and IPI self-report criteria. A higher magnitude correlation coefficient is interpreted for the self-report-based criteria to account for shared method variance.

**Emotional dysfunction.** Because SUI had no variance for males, it is not included in the tables or in-text interpretations for this sample. For men, most of the scale scores in this domain were associated with a negative recommendation by the evaluating psychologist (EID, RCd, RC7, NFC, STW, ANX, ANP, BRF, NEGE-r, and INTR-r; refer to Table 1 for scale names). STW scores were associated with excessive force and inappropriate language and NEGE-r scores were associated with sustained internal affairs complaints. MSF scores were correlated with poor ethics and poor response to feedback. Regarding associations with CPI criteria, among the males, NEGE-r scores had the most robust findings, as it was associated with CPI-based risk for anger management problems, risk for job performance problems, and probability of being rated poorly suited by the evaluating psychologist. RC7 scores were correlated with risk of job performance problems, and EID scores were correlated with a higher probability of being rated as poorly suited. RC7 scores were also associated with risk for job performance problems among females. Other correlations in the female sample included those with CPI probability of being rated poorly suited by a psychologist (RCd) and risk of being fired (RCd and BRF). Regarding associations with the IPI, men demonstrated associations with anxiety (STW), phobic personality (INTR-r), depression (EID, RC7, and NEGE-r), and lack of assertiveness (RC2).

**Thought dysfunction.** Scores from this domain were associated with several ES and chart review criteria in the male sample. All were

Table 1  
Means and Standard Deviations for MMPI-2-RF Scales Across Police Officer Samples

Scale	CG men (n = 988)		CG women (n = 337)		Hired men (n = 349)		Hired women (n = 76)		Unhired men (n = 238)		Unhired women (n = 45)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Variable Response Inconsistency (VRIN-r)	41	7	41	6	38	4	39	6	39	5	39	5
True Response Inconsistency (TRIN-r)	52F	6	52F	6	51F	5	52F	5	52F	5	51F	5
Infrequent Responses (F-r)	44	3	44	4	43	2	43	2	43	3	43	2
Infrequent Psychopathology Responses (Fp-r)	45	5	44	5	44	4	44	5	44	4	44	3
Infrequent Somatic Responses (FS)	45	6	45	6	43	3	44	4	44	5	44	5
Symptom Validity (FBS-r)	46	6	46	6	45	6	45	5	44	6	44	5
Response Bias Scale (RBS)	46	7	44	7	44	6	43	6	43	7	43	8
Uncommon Virtues (L-r)	59	13	58	13	53	11	52	10	55	13	54	10
Adjustment Validity (K-r)	63	8	63	8	66	7	65	6	64	7	64	6
Emotional/Internalizing Dysfunction (EID)	36	6	37	6	34	4	34	5	34	4	35	4
Thought Dysfunction (THD)	44	7	44	7	41	5	42	5	42	6	43	5
Behavioral/Externalizing Dysfunction (BXD)	48	7	45	7	47	6	45	7	48	7	46	7
Demoralization (RCd)	40	5	40	5	38	3	38	4	39	4	39	3
Somatic Complaints (RC1)	41	6	43	7	39	4	40	5	40	5	41	6
Low Positive Emotions (RC2)	41	7	40	6	39	5	38	5	39	6	39	6
Cynicism (RC3)	44	8	44	8	40	7	40	7	43	9	44	9
Antisocial Behavior (RC4)	46	7	45	7	45	6	44	6	46	8	44	6
Ideas of Persecution (RC6)	46	6	46	6	44	4	44	5	45	6	44	4
Dysfunctional Negative Emotions (RC7)	38	6	38	5	36	4	38	5	37	4	37	5
Aberrant Experiences (RC8)	44	7	44	7	41	5	43	5	43	6	43	6
Hypomanic Behavior (RC9)	43	8	42	7	42	7	42	6	44	8	44	8
Malaise (MLS)	43	6	43	6	40	4	40	3	41	4	41	4
Gastrointestinal Complaints (GIC)	46	4	47	5	46	1	46	0	46	2	46	4
Head Pain Complaints (HPC)	43	5	44	6	42	3	44	5	43	4	44	5
Neurological Complaints (NUC)	45	7	46	7	44	5	44	6	44	6	44	6
Cognitive Complaints (COG)	43	6	43	5	41	4	41	4	42	4	42	4
Suicidal/Death Ideation (SUI)	46	2	45	1	45	0	46	2	45	0	45	0
Helplessness/Hopelessness (HLP)	42	4	42	3	41	2	41	3	41	3	41	2
Self-Doubt (SFD)	43	4	43	4	43	3	43	3	43	3	42	3
Inefficacy (NFC)	41	6	40	5	39	4	39	4	39	5	41	6
Stress/Worry (STW)	41	6	41	6	39	4	39	5	40	5	40	5
Anxiety (AXY)	45	3	45	4	45	3	44	2	45	4	45	4
Anger Proneness (ANP)	41	5	41	5	39	3	41	5	40	3	41	5
Behavior-Restricting Fears (BRF)	44	4	44	5	43	3	44	4	44	4	45	5
Multiple Specific Fears (MSF)	43	6	46	8	42	6	45	7	43	7	45	8
Juvenile Conduct Problems (JCP)	50	9	49	9	48	8	46	7	50	8	46	7
Substance Abuse (SUB)	45	6	45	6	45	5	46	6	46	6	45	5
Aggression (AGG)	42	7	42	6	41	5	42	6	43	7	42	6
Activation (ACT)	43	8	45	9	41	7	43	8	43	8	43	9
Family Problems (FML)	42	6	44	7	40	5	42	6	41	6	41	5
Interpersonal Passivity (IPP)	46	7	46	6	46	6	45	5	45	7	45	6
Social Avoidance (SAV)	48	8	45	7	45	6	44	7	45	6	43	6
Shyness (SHY)	42	7	41	6	40	5	40	5	40	6	41	7
Disaffiliativeness (DSF)	46	5	45	4	45	3	45	3	46	5	45	4
Aggressiveness (AGGR-r)	51	7	50	6	51	6	50	5	53	7	52	7
Psychoticism (PSYC-r)	43	7	44	7	41	5	42	5	42	6	42	5
Disconstraint (DISC-r)	53	7	48	7	53	6	48	7	54	8	50	8
Negative Emotionality/Neuroticism (NEGE-r)	39	6	39	6	36	5	39	6	38	5	39	6
Introversion/Low Positive Emotionality (INTR-r)	49	8	46	7	47	7	45	6	46	6	45	8

Note. MMPI-2-RF = Minnesota Multiphasic Personality Inventory-2-Restructured Form; CG = Police Officer Candidate Comparison Group; SD = standard deviation.

correlated with a negative psychologist recommendation, decreased likelihood of being rehired, and deceptiveness. Other associations included use of excessive force (THD and RC6), inappropriate language (THD), rude behavior (THD and RC6), uncooperativeness toward peers (RC6), abuse of authority (RC6), no responsibility taken for mistakes (RC6), missing court appearances (RC8), poor response to feedback (RC6), and involuntary departure (THD and RC6). The thought dysfunction domain scale scores were also correlated with

sustained internal affairs complaints in general and those of greater severity. Scale scores from this domain were generally unassociated with self-report criteria in both the male and female samples, though RC6 was associated with CPI increased risk of being fired among the females.

**Behavioral dysfunction.** All of these scales were associated in the male sample with a negative recommendation from the evaluating psychologist. BXD, RC4, and DISC-r scores were

Table 2

Male Police Officer Interpreted Correlations Between MMPI-2-RF Scales and Employee Survey (Ns = 254–288), Complaints (Ns = 187–224), Involuntary Departure (N = 190), and Psychologist Recommendation (N = 424)

Scale	Correlates
Higher-Order	
Emotional/Internalizing Dysfunction (EID)	Marginal psychologist recommendation (.18/.39)
Thought Dysfunction (THD)	Use of excessive force (.16/.34)
	Inappropriate language (.12/.26)
	Rude behavior (.15/.31)
	Deceptiveness (.28/.54)
	Would not rehire (.26/.50)
	Sustained internal affairs complaint (.16/.37)
	Sustained severe complaint (.18/.41)
	Involuntary departure (.18/.41)
	Marginal psychologist recommendation (.22/.50)
Behavioral/Externalizing Dysfunction (BXD)	Sustained internal affairs complaint (.22/.37)
	Sustained severe complaint (.18/.30)
	Marginal psychologist recommendation (.30/.48)
Restructured Clinical	
Demoralization (RCd)	Marginal psychologist recommendation (.16/.42)
Somatic Complaints (RC1)	Marginal psychologist recommendation (.12/.29)
Cynicism (RC3)	Inappropriate language (.15/.22)
	Rude behavior (.14/.21)
	Inappropriate sexual attitudes/behaviors (.16/.23)
	Conduct unbecoming (.16/.24)
	Poor integrity (.16/.23)
	Would not rehire (.19/.27)
	Sustained severe complaint (.19/.28)
	Marginal psychologist recommendation (.29/.42)
Antisocial Behavior (RC4)	Sustained internal affairs complaint (.20/.33)
	Sustained severe complaint (.20/.33)
	Marginal psychologist recommendation (.32/.50)
Persecutory Ideation (RC6)	Use of excessive force (.18/.42)
	Rude behavior (.19/.44)
	Poor public attitude (.18/.42)
	Uncooperative toward supervisors (.16/.38)
	Deceptiveness (.22/.50)
	Abuses authority (.24/.52)
	No responsibility for mistakes (.22/.49)
	Responds poorly to feedback (.16/.38)
	Would not rehire (.20/.46)
	Sustained severe complaint (.22/.52)
	Marginal psychologist recommendation (.19/.46)
	Involuntary departure (.17/.43)
Dysfunctional Negative Emotions (RC7)	Marginal psychologist recommendation (.18/.41)
Aberrant Experiences (RC8)	Deceptiveness (.23/.42)
	Misses court (.13/.26)
	Would not rehire (.24/.44)
	Sustained internal affairs complaint (.24/.48)
	Sustained severe complaint (.17/.36)
	Marginal psychologist recommendation (.24/.49)
	Marginal psychologist recommendation (.25/.35)
Hypomanic Activation (RC9)	
Specific Problems	
Malaise (MLS)	Marginal psychologist recommendation (.10/.26)
Head Pain Complaints (HPC)	Marginal psychologist recommendation (.11/.40)
Cognitive Complaints (COG)	Misses court (.17/.47)
	Involuntary departure (.20/.51)
	Marginal psychologist recommendation (.17/.45)
Inefficacy (NFC)	Marginal psychologist recommendation (.13/.28)
Stress/Worry (STW)	Use of excessive force (.18/.38)
	Inappropriate language (.15/.33)
	Marginal psychologist recommendation (.13/.28)
Anxiety (AXY)	Marginal psychologist recommendation (.13/.54)
Anger Proneness (ANP)	Marginal psychologist recommendation (.14/.47)
Behavior Restricting Fears (BRF)	Marginal psychologist recommendation (.10/.34)
Multiple Specific Fears (MSF)	Citizen complaints (.13/.20)
	Poor integrity (.12/.19)

(table continues)

Table 2 (continued)

Scale	Correlates
Juvenile Conduct Problems (JCP)	Responds poorly to feedback (.15/.23)
Substance Abuse (SUB)	Sustained severe complaint (.17/.26)
Aggression (AGG)	Marginal psychologist recommendation (.22/.28)
	Marginal psychologist recommendation (.18/.33)
	Misses court (.16/.30)
Activation (ACT)	Marginal psychologist recommendation (.29/.51)
Family Problems (FML)	Marginal psychologist recommendation (.16/.23)
	Deceptiveness (.14/.27)
	Would not rehire (.18/.35)
	Marginal psychologist recommendation (.20/.38)
Interpersonal Passivity (IPP)	Marginal psychologist recommendation (–.11/–.19)
Shyness (SHY)	Marginal psychologist recommendation (.12/.25)
Disaffiliativeness (DSF)	Marginal psychologist recommendation (.11/.39)
Personality Psychopathology 5	
Aggressiveness-Revised (AGGR-r)	Marginal psychologist recommendation (.19/.30)
Psychoticism-Revised (PSYC-r)	Deceptiveness (.21/.43)
	Would not rehire (.23/.46)
	Sustained internal affairs complaint (.16/.37)
	Sustained severe complaint (.20/.45)
Disconstraint-Revised (DISC-r)	Marginal psychologist recommendation (.21/.46)
	Responds poorly to feedback (–.14/–.24)
	Sustained internal affairs complaint (.17/.27)
	Marginal psychologist recommendation (.23/.36)
Negative Emotionality/Neuroticism-Revised (NEGE-r)	Marginal psychologist recommendation (.21/.41)
	Sustained internal affairs complaint (.15/.30)
Introversion/Low Positive Emotionality-Revised (INTR-r)	Marginal psychologist recommendation (–.10/–.15)

*Note.* MMPI-2-RF = Minnesota Multiphasic Personality Inventory-2-Restructured Form. All correlates are statistically significant ( $p < .05$ ). Correlations to left in parentheses are zero-order; Correlations to the right are disattenuated for range restriction.

associated with future sustained internal affairs complaints. AGG scores were correlated with missing court appearances, and DISC-r scores were negatively correlated with poor response to feedback. The behavioral dysfunction domain scale scores demonstrated robust correlations with the CPI law enforcement risk equations in both the male and female samples. BXD, RC4, RC9, JCP, AGG, and DISC-r scores were correlated with the majority of these indicators. However, only RC4 and RC9 scores were associated with risk for being fired, and ACT and AGGR-r scores did not demonstrate meaningful correlations with the CPI law enforcement risk indicators. Associations with IPI scale scores among males included Guardedness (negative; BXD & RC4), Substance Abuse (RC9), Antisocial Attitudes (RC9), Hyperactivity (BXD, RC9, & DISC-r), and Lack of Assertiveness (negative; AGGR-r).

**Somatic/cognitive complaints.** Because GIC had no variance for females, it is not included in their tables or in-text interpretations. Among the males, all Somatic/Cognitive Scale scores were associated with a negative recommendation from the evaluating psychologist. COG scores were also correlated with involuntary departure and missing court appearances. Though the Somatic/Cognitive Scale scores were generally uncorrelated with self-report criteria in the male sample, RC1, MLS, and HPC scores were associated with CPI risk for being rated as poorly suited by evaluating psychologist in the female sample.

**Interpersonal functioning.** All scale scores in this domain were associated with a negative recommendation from the evaluating psychologist. RC3 score scores demonstrated robust associations with the ES and chart review data in the male sample, as they were associated with inappropriate language, rude behavior, inappropriate sexual attitudes, conduct unbecoming, poor integ-

ity, unlikely to hire again, and sustained severe IA complaints. Family Problems (FML) Scale scores were associated with deceptiveness and unlikely to hire again. In the male sample, RC3 Scale scores were associated with CPI increased risk for anger management problems, being rated poorly suited, and being fired. This scale was also correlated with CPI increased risk of being fired in the female sample. Scale scores in the interpersonal functioning domain demonstrated associations with the following IPI scores in the male sample: Antisocial Attitudes (RC3), Phobic Personality (SAV), Lack of Interpersonal Assertiveness (IPP), and Sexual Concerns (DSF).

Overall, after disattenuation for preselection factors, most of the correlation coefficients described in text demonstrated moderate effect sizes in analyses with the ES and chart review criteria, with nearly all reaching a magnitude of at least  $r > |.20|$ . This value is the traditionally used benchmark for meaningful correlations in MMPI research (Graham, 2012). All of the disattenuated correlation coefficients with self-report criteria described in text demonstrated large effect sizes.

### Relative Risk Ratios

In Table 3 we present relative risk ratios that met our previously described selection criteria (i.e., those that had statistically significant zero-order correlation coefficients and yielded selection ratios ranging from 3.0% to 20.0%). To conserve space, we only report statistically significant findings. In order to assist the reader with interpretation, we provide a description of the relative risk ratio for THD and use of excessive force (i.e., the first row of Table 8). The selection ratio indicates that 5.8% of the sample



Table 3  
*MMPI-2-RF Statistically Significant Score RRRs With External Criteria (Male Police Officers)*

Scale	Cutoff ( $\geq$ )	SR	BR	Criterion	Risk if elevated	Risk if not elevated	RRR	95% CI
Thought Dysfunction (THD)	50T	5.8%	3.1%	Use of excessive force	13.3%	2.5%	5.38	[1.18, 24.42]
	50T	3.5%	11.1%	Sustained internal affairs complaint	42.9%	9.9%	4.33	[1.66, 11.27]
	50T	6.3%	3.5%	Deceptiveness	22.2%	2.2%	9.89	[3.06, 31.92]
	50T	6.8%	10.0%	Would not rehire	31.6%	8.4%	3.75	[1.73, 8.12]
	45T	19.8%	3.1%	Use of excessive force	7.8%	1.9%	4.04	[1.05, 15.61]
	45T	19.9%	8.7%	Rude behavior	17.5%	6.5%	2.69	[1.28, 5.67]
	45T	20.0%	3.5%	Deceptiveness	10.5%	1.8%	6.00	[1.75, 20.56]
	45T	17.9%	6.8%	Involuntary departure	17.6%	4.5%	3.93	[1.41, 10.97]
Behavioral/Externalizing Dysfunction (BXD)	50T	19.1%	11.1%	Sustained internal affairs complaint	21.1%	8.7%	2.42	[1.09, 5.35]
	50T	18.7%	5.3%	Sustained severe complaint	14.3%	3.3%	4.34	[1.33, 14.19]
Cynicism (RC3)	50T	8.3%	8.9%	Rude behavior	20.7%	7.8%	2.64	[1.18, 5.91]
	50T	8.0%	5.3%	Sustained severe complaint	20.0%	4.1%	4.91	[1.41, 17.07]
Antisocial Behavior (RC4)	50T	19.1%	11.1%	Sustained internal affairs complaint	21.1%	8.7%	2.42	[1.09, 5.35]
Ideas of Persecution (RC6)	55T	7.0%	5.3%	Sustained severe complaint	23.1%	4.0%	5.74	[1.68, 19.62]
	55T	6.8%	6.8%	Involuntary departure	23.1%	5.6%	4.08	[1.28, 13.04]
	55T	8.4%	8.7%	Rude behavior	25.0%	7.2%	3.46	[1.53, 7.83]
	55T	8.4%	8.7%	Poor public attitude	25.0%	7.2%	3.46	[1.53, 7.83]
	55T	8.7%	6.6%	Uncooperative toward supervisors	20.0%	5.3%	3.76	[1.47, 9.57]
	55T	8.8%	3.5%	Deceptiveness	16.0%	2.3%	6.93	[2.10, 22.94]
	55T	8.5%	2.1%	Authority abuse	12.5%	1.2%	10.83	[2.31, 50.77]
	55T	8.7%	7.7%	No responsibility for mistakes	32.0%	5.3%	5.99	[2.78, 12.88]
Aberrant Experiences (RC8)	55T	9.3%	10.0%	Would not rehire	26.9%	8.3%	3.26	[1.53, 6.92]
	50T	7.4%	3.5%	Deceptiveness	14.3%	2.7%	5.39	[1.50, 19.33]
	50T	7.9%	10.0%	Would not rehire	27.3%	8.5%	3.20	[1.45, 7.05]
	50T	5.0%	11.1%	Sustained internal affairs complaint	30.0%	10.1%	2.98	[1.06, 8.43]
Cognitive Complaints (COG)	50T	10.6%	2.8%	Misses court	13.3%	1.6%	8.47	[2.23, 32.12]
	50T	12.6%	6.8%	Involuntary departure	25.0%	4.2%	5.93	[2.17, 16.16]
Multiple Specific Fears (MSF)	50T	9.1%	5.3%	Sustained severe complaint	17.6%	4.1%	4.29	[1.22, 15.07]
Family Problems (FML)	50T	4.6%	10.0%	Would not rehire	38.5%	8.6%	4.46	[2.02, 9.85]
	50T	4.7%	3.2%	Deceptiveness	18.8%	2.4%	7.69	[2.25, 26.26]
	45T	11.8%	10.0%	Would not rehire	21.2%	8.5%	2.49	[1.15, 5.41]
Psychoticism-Revised (PSYC-r)	50T	3.7%	5.3%	Sustained severe complaint	28.6%	4.4%	6.43	[1.66, 24.87]
	50T	4.5%	11.1%	Sustained internal affairs complaint	44.4%	9.5%	4.69	[2.00, 11.00]
	50T	6.0%	3.5%	Deceptiveness	17.6%	2.6%	6.76	[1.92, 23.83]
	50T	6.4%	10.0%	Would not rehire	27.8%	8.8%	3.16	[1.36, 7.34]
Disconstraint-Revised (DISC-r)	65T	6.0%	11.1%	Sustained internal affairs complaint	33.3%	9.6%	3.46	[1.39, 8.63]

*Note.* MMPI-2-RF = Minnesota Multiphasic Personality Inventory-2-Restructured Form; RRR = relative risk ratio; SR = selection ratio; BR = base rate; CI = confidence interval. For all variables, *N*s range from 190 to 288. All RRRs are significant at an alpha of .05.

scored at or above a cutoff of 50T. The base rate indicates that 3.1% of the sample was described by supervisors as having used excessive force. The risk for this outcome if THD is  $\geq 50T$  is 13.3%, and if THD is  $< 50T$ , the risk is 2.5%. Dividing the risk if elevated by the risk if not elevated yields a RRR of 5.38. Because the 95% confidence interval for this analysis ranges from 1.18 to 24.42, the finding is statistically significant (i.e., because the range does not overlap with one). Overall, the RRR analyses demonstrated meaningful findings for a variety of scales at cutoffs of 50T and 55T, which yielded selection ratios ranging from 3.5% to 20.0%. The relative risk ratios demonstrated substantially increased risk for problems when scales were elevated, with RRRs ranging from 2.4 to 10.8. For example, individuals with elevations at 45T on FML were 2.5 times more likely to be rated as not likely to rehire, and those with elevations at 55T on RC6 were 10.8 times more likely to have authority abuse problems.

### Discussion

The purpose of this study was to extend the findings of Sellbom et al. (2007) to the entire MMPI-2-RF with a larger sample and additional criteria. We found that hired and unhired officers generally produced similar mean MMPI-2-RF scale scores, as did males and females. However, both genders and the two subsamples produced meaningfully lower mean scores than the general population on most scales, although they evidenced substantially higher mean scores on K-r. We found that MMPI-2-RF scale scores, particularly in the thought dysfunction and behavioral/externalizing dysfunction domains, were associated with a number of supervisor-rated problem behaviors and collateral self-report data. These associations were of a meaningful magnitude, particularly when disattenuated for range restriction. Implications of these correlations are illustrated by a number of statistically significant relative risk ratios, obtained for cutoffs ranging from 45T to 65T. Several aspects of these findings warrant further discussion.

The finding that the hired and unhired samples did not meaningfully differ on the MMPI-2-RF illustrates that the decreased means and variances in this sample relative to the general population were likely the result of preselection rather than selection factors. As noted earlier, preselection refers to various factors that restrict the range of scores of individuals who are referred for pre-employment psychological evaluations (e.g., civil service exams, the absence of a criminal behavior, oral board interviews, and a stable work history). Selection effects would stem from the evaluating psychologist's use of the MMPI-2 to screen out candidates, which could potentially lead to lower and less variant scores on the test compared to those who were hired. However, this was not the case in the current investigation, demonstrating the potential impact of preselection factors, which are more varied and difficult to identify. Of note in this context, the screening psychologist in the vast majority of these evaluations did not have access to any of the MMPI-2-RF scale scores (only the MMPI-2 without the RC Scales).

As this study demonstrates, it is possible to correct for range restriction resulting from preselection factors by applying formulas derived by Hunter and Schmidt (2004) using the general population standard deviation as an estimate of the nonrange restricted standard deviation. An alternative approach would be to only

disattenuate the correlate findings for the hired sample using the combined hired and unhired sample to estimate the nonrange restricted standard deviation for each scale. However, doing so would only disattenuate correlation coefficients for selection factors, with preselection factors remaining unaccounted for.

One question that arises is which of the nonrestricted standard deviations estimates should researchers use: the general population standard deviation or the standard deviation of the sample evaluated by a psychologist? We believe researchers should consider providing corrected correlations using both estimates, allowing for calculation of a range of possible validity coefficients. Practitioners in sites with minimal preselection can refer to corrected correlations using the former estimate, whereas those in sites with maximal preselection can refer to corrected correlations using the latter estimate. It is important to note in this context that the current sample was heavily preselected, yielding standard deviations that were virtually the same for the hired and unhired samples. Thus, to avoid redundancy we did not calculate correlations disattenuated for selection factors, because, as demonstrated by Sellbom and colleagues (2007), these corrections yield correlations only marginally different from zero-order correlations when the nonrestricted standard deviation estimate is similar to the sample standard deviation.

A related question is on which correlations should one conduct significance testing? We believe that to reduce Type I error rates, particularly for scales that are severely restricted in variance, significance testing should only be conducted on zero-order (i.e., uncorrected) correlations. To offset statistical power costs introduced by diminished correlational magnitudes due to range restriction, researchers can potentially increase correlational magnitudes by using more reliable criteria and, relatedly, minimizing extraneous variables and confounds. Furthermore, one could utilize larger samples and avoid alpha-adjustment procedures. Ellis (2010) characterizes alpha-adjustments as "an alarming trend" that reduces statistical power (p. 79). For example, the current study had a hired sample size of approximately 275 males, which yields a power value of .70 to detect correlational magnitudes of .15 using an alpha of .05 (Faul, Erdfelder, Lang, & Buchner, 2007). Adjusting the alpha to .01 would yield a power value of .46, and further lowering the alpha to .001 would yield a power value of .21.

More broadly, this study illustrates the need to consider the characteristics of a population when evaluating effect size estimates. In the context of the current investigation, for example, if only zero-order correlations were presented, the coefficients would underestimate the validity of the test in police screening populations with minimal preselection. Relatedly, if the current sample was drawn from a population with minimal preselection, zero-order correlations would overestimate the validity of the test for populations with maximal preselection. Because variance is related to effect size, we suggest considering the characteristics of a sample (whether it be normative, mental health outpatients, mental health inpatients, etc.) relative to the population with which one is practicing.

The correlation findings in the current study identified a number of meaningful associations, including ones from all of the domains assessed by the MMPI-2-RF, but especially thought dysfunction and behavioral/externalizing dysfunction. For example, Higher-Order Scale thought dysfunction demonstrated associations with a number of ES criteria, including use of excessive force, inappro-

appropriate language, rude behavior, deceptiveness, decreased likelihood of rehire, sustained IA complaints, and involuntary departure. The findings with Higher-Order Scale THD extend those of Sellbom et al. (2007), who reported robust correlations between RC6 and RC8 scores with similar problem behaviors. Whereas clinically elevated (i.e., greater than or equal to 65T) scores on RC6 and RC8 are associated with paranoid ideation and aberrant experiences, respectively, Sellbom and Ben-Porath (2005) reported significant correlations in a nonclinical sample between RC6 scores and feelings of victimization, mistreatment, and betrayal, as well as a correlation between RC8 scores and a propensity toward immersion in one's own thoughts and experience. Similarly, clinically elevated THD scores are associated with disordered thinking, but, at lower levels, scores on this scale correlate with alienation, proclivity to experience imaginative and altered states, and low achievement orientation (Ben-Porath, 2012). No male officers in the hired sample produced elevations at or above the clinical standard of 65T, indicating that correlations with problem behaviors reflect individual differences that occur below this level. Indeed, the RRR analyses indicated that cutoffs of 45T and 50T on this scale were associated with substantially increased risk of problem behaviors.

The thought dysfunction domain had somewhat lower associations with the IPI and CPI in the male and female samples. Though the number of significant correlations with the IPI was relatively small, the pattern of findings indicates that MMPI-2-RF scale scores are correlated meaningfully with a measure designed to predict job performance problems in police officers. In contrast, the MMPI-2-RF behavioral/externalizing domain scales showed robust associations with the CPI, as demonstrated by correlations between the CPI specialized law enforcement risk indicators and MMPI-2-RF scales BXD, RC4, RC9, JCP, AGG, and DISC-r. These findings, coupled with associations between the behavioral/externalizing domain scale scores and subsequent internal affairs complaints, indicate that higher scores on the MMPI-2-RF externalizing scales can be interpreted as indicating increased risk for a variety of negative outcomes in police candidates. This inference is supported by research showing that BXD, a dimensional measure of acting-out proclivities, correlates positively with other measures of impulsive behavior and anger proneness, and negatively with tolerance and agreeableness (van der Heijden, Egger, Rossi, van der Veld, & Derksen, 2013). More broadly, these findings extend those of Sellbom et al. (2007) insofar as the Higher-Order and Specific Problems Scales associated with RC4 and RC9 demonstrated meaningful associations with criteria.

Relative risk ratio analyses identified significantly increased risk for negative outcomes at cutoffs of 45T through 55T. These findings illustrate the need to rely on lower (than the traditional 65 *T*-score level used to designate clinically significant elevations) cutoffs to optimally detect increased risk for negative outcomes in police candidates. It is noteworthy that the selection ratios associated with these lower cutoffs are consistent with the 65T elevation rate in the normative sample because of the substantially lower mean scores in this sample, which are reflected in Table 1. In other words, these lower cutoffs represent similar levels of deviation (to 65T in the normative sample) from the mean for police candidates. Several meaningful findings were observed at these cutoffs. For example, among those scoring at or above 50T on the FML scale, 38.5% were identified as officers whom a supervisor would not

rehire (if given an opportunity) whereas only 8.6% of those who scored below 50T on FML were similarly rated. Thus, police candidates who scored 50T or above on FML were at over a four times greater risk of supervisors indicating they would not rehire them than were those who scored below the cutoff.

The study has practical implications. First, it demonstrates the utility of lower cutoffs in this setting, as the standard 65T cutoff used to demarcate clinically elevated MMPI scores yielded only one interpretable relative risk ratio in this study. Owing to the preselection and selection factors discussed earlier, very few of the participants produced clinically elevated scores. However, as noted previously, the current sample had particularly low range-restricted scores on the MMPI-2-RF substantive scales. Therefore, the specific cutoffs that yielded the strongest relative risk ratios in the current investigation may not be ideal for other settings. Second, MMPI-2-RF scale interpretations are based not only on the content of test items, but also clinical correlates of higher scores on the scale. Obtaining correlate information using job-relevant criteria among police officers could clarify MMPI-2-RF interpretation in this setting in the same manner. Because research in this setting is particularly challenging, owing to issues discussed earlier, multiple studies of MMPI-2-RF predictors of job-relevant outcomes are needed to identify generalizable associations appropriate for use in clinical practice. For this reason, replication with other samples from a range of departments is needed to identify the most generalizable cutoffs and correlates for each scale.

This study has limitations warranting discussion. First, we chose not to calculate correlations between MMPI-2-RF substantive scales and supervisor rating criteria with exceptionally low base rates in the current sample (<1.5%). These included inappropriate sexual relationships, financial/gambling problems, involvement in civil litigation, unlawful activity, alcohol abuse, substance abuse, using position for personal advantage, accepting gratuities, and showing bias toward others. Perhaps not coincidentally, these are more severe problems for which it would be particularly relevant to identify risk in police candidate assessments. Future studies with larger samples are needed to identify MMPI-2-RF predictors of these and similar very low base rate problems. Along the same lines, we were unable to calculate correlations and relative risk ratios with supervisor ratings for female candidates, owing to the relatively small number of women for whom these data were available. Finally, interrater reliability data was not available. Therefore, it is not clear whether some criteria were impacted by reliability problems, which would have increased Type II error rates.

These limitations notwithstanding, the current study extended the findings of Sellbom et al. (2007) by examining the full range of MMPI-2-RF scales in predicting problematic police officer job performance and collateral psychological test scores. Our results provide empirical support and guidance for using the MMPI-2-RF in police candidate assessments. In particular our findings highlight the need for and utility of relying on lower (than the traditional 65T) cutoffs when assessing psychological risk for negative outcomes in this setting. Our results also document the utility of attenuation corrections when estimating the criterion validity of psychological test scores in police candidate screenings where the degree of preselection varies.



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Received March 16, 2014

Revision received September 8, 2014

Accepted September 9, 2014 ■