

# Development and Validation of MMPI-2-RF Scales for Indexing Triarchic Psychopathy Constructs

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## Abstract

The triarchic model characterizes psychopathy in terms of three distinct dispositional constructs of boldness, meanness, and disinhibition. The model can be operationalized through scales designed specifically to index these domains or by using items from other inventories that provide coverage of related constructs. The present study sought to develop and validate scales for assessing the triarchic model domains using items from the Minnesota Multiphasic Personality Inventory–2–Restructured Form (MMPI-2-RF). A consensus rating approach was used to identify items relevant to each triarchic domain, and following psychometric refinement, the resulting MMPI-2-RF-based triarchic scales were evaluated for convergent and discriminant validity in relation to multiple psychopathy-relevant criterion variables in offender and nonoffender samples. Expected convergent and discriminant associations were evident very clearly for the Boldness and Disinhibition scales and somewhat less clearly for the Meanness scale. Moreover, hierarchical regression analyses indicated that all MMPI-2-RF triarchic scales incremented standard MMPI-2-RF scale scores in predicting extant triarchic model scale scores. The widespread use of MMPI-2-RF in clinical and forensic settings provides avenues for both clinical and research applications in contexts where traditional psychopathy measures are less likely to be administered.

## Keywords

MMPI-2-RF, psychopathy, triarchic, personality assessment

Individuals with psychopathy are considered callous societal predators who use aggression and manipulation in order to influence and control others to serve their own egocentric needs (Hare, 1996). They make up approximately 0.5% to 1% of the general population (Coid, Yang, Ullrich, Roberts, & Hare, 2009; Neumann & Hare, 2008) but account for 15% to 20% of prison inmates (Hare, 2003), and their actions have serious detrimental effects on society. Offenders with psychopathy are responsible for a disproportionate amount of crime and violence and exhibit high rates of reoffending (see Hare & Neumann, 2008, for a review). In the business world, those elevated on psychopathic traits can be responsible for creating hostile work environments and other egregious violations of the public trust that cause financial hardship (Babiak, Neumann, & Hare, 2010). Thus, the accuracy of psychopathy assessment has substantial implications for decision making and public policy, both in clinical-forensic (e.g., offender risk classification, parole board decisions, court-mandated interventions, prevention and intervention) and in nonclinical contexts (e.g., personnel selection and assignment, organizational dynamics, counterproductive work behaviors).

Multiple descriptions have been provided of the symptomatic features of psychopathy (e.g., Cleckley, 1941, 1988; Cooke, Hart, Logan, & Michie, 2012; Hare, 1980, 2003; Karpman, 1941; McCord & McCord, 1964; Patrick, Fowles, & Krueger, 2009), with the most agreed-on features typically being hierarchically subsumed under three thematic domains of interpersonal (e.g., superficial charm, manipulativeness, deceitfulness, grandiosity), affective (e.g., callousness, remorselessness, restricted emotionality, fearlessness), and behavioral/disinhibitory (e.g., impulsivity, irresponsibility, excitement seeking) symptoms. However, a number of debates have also raged in the field, concerning optimal

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latent factor structures (e.g., Cooke & Michie, 2001; Hare & Neumann, 2006), whether antisociality/criminality should be a core structural component of the disorder (e.g., Hare & Neumann, 2010; Skeem & Cooke, 2010), and whether fearless-dominance is relevant to psychopathy (e.g., Lilienfeld et al., 2012; Miller & Lynam, 2012). These contrasting perspectives on psychopathy and debates surrounding them inspired Patrick et al. (2009; see also Patrick, 2010a) to propose the triarchic model of psychopathy. The model integrates differing accounts of the disorder in historic writings and contemporary measurement instruments' phenotypic constructs by characterizing psychopathy in terms of phenotypic domains of *boldness*, *meanness*, and *disinhibition*.

### Triarchic Psychopathy Model

Boldness entails tendencies toward social dominance, thrill seeking/fearlessness, and low stress reactivity (Patrick et al., 2009) and can be traced back to Cleckley's (1976) and Lykken's (1995) descriptions of psychopathy. Cleckley's diagnostic criteria for psychopathy included specific indicators of social efficacy (superficial charm), stress immunity (absence of nervousness, poverty of affect), and fearlessness (failure to learn from punishment), which he described as an outward "mask of sanity" concealing an underlying pathology expressed as severe and persistent behavioral deviancy. Boldness is indexed clearly and distinctively by one of the two factors of the Psychopathic Personality Inventory/Psychopathic Personality Inventory-Revised (PPI/PPI-R; Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005), labeled fearless-dominance (Benning, Patrick, Hicks, Blonigen, & Krueger, 2003; but see Neumann, Malterer, & Newman, 2008, for a critique of the PPI two-factor model). Albeit less strongly, it is also related to Factor 1 of Hare's (2003) Psychopathy Checklist-Revised (PCL-R)—in particular, its Interpersonal facet (Venables, Hall, & Patrick, 2014; Wall, Wygant, & Sellbom, 2015).

The triarchic domain of meanness encompasses attenuated empathic responding, callousness, exploitativeness, empowerment through cruelty, inability to form close attachments with others, and excitement seeking (Patrick et al., 2009).<sup>1</sup> It has historical roots in McCord and McCord's (1964) description of psychopathic criminals as cold, vicious, and predatory individuals who are primarily motivated by hostile antipathy. Presently, this view is exemplified by Hare's (e.g., 1996, 2003) writings about psychopathy in adulthood and by the concept of callous-unemotional traits in childhood (e.g., Barry et al., 2000). Among contemporary measurement instruments, meanness is embodied in the Affective facet of PCL-R Factor 1 and in the callous-unemotional factor of the youth-oriented Antisocial Process Screening Device (APSD; Frick & Hare, 2001) and its self-report counterpart, the Inventory of Callous-Unemotional

traits (ICU; Frick, 2004). Selected subscales of adult self-report psychopathy measures, such as the Coldheartedness scale of the PPI and the Callousness and Egocentricity subscales from Levenson, Kiehl, and Fitzpatrick's (1995) Self-Report Psychopathy (LSRP; see Sellbom, 2011) scale also reflect meanness as described by the triarchic model.

Finally, the triarchic construct of disinhibition entails proneness toward impulse control problems in association with nonplanfulness, failure to delay gratification, irresponsibility, angry aggression, and deficient behavioral restraint (Patrick et al., 2009). Tendencies of these types are evident in most conceptual accounts of psychopathy (e.g., Cleckley, 1941, 1976; Hare, 1996; McCord & McCord, 1964) and in virtually all assessment instruments for psychopathy, including the PCL-R, PPI, APSD, and LSRP (Patrick, 2010a; Patrick et al., 2009).

As a specific means for operationalizing the triarchic model constructs, Patrick (2010b) developed the 58-item Triarchic Psychopathy Measure (TriPM). The TriPM includes disinhibition and meanness scales consisting of items from the Externalizing Spectrum Inventory (Krueger et al., 2007) that index the inventory's broad externalizing-proneness and callous-aggression factors, respectively (Patrick et al., 2013)—along with a boldness scale that reflects the factor in common among diverse fear/fearlessness scales (Kramer, Patrick, Krueger, & Gasperi, 2012). Research using community, forensic, and/or correctional samples has provided evidence for the convergent and discriminant validity of the TriPM domain scales in relation to criteria of various types, in ways consistent with conceptual expectations (Driscoll, Patrick, & Aarsal, 2014; Marion et al., 2013; Patrick, 2010b; Poy, Segarra, Esteller, López, & Moltó, 2014; Sellbom & Phillips, 2013; Stanley, Wygant, & Sellbom, 2013). For instance, TriPM Boldness scores correlate positively with scores on the PCL-R Interpersonal facet, PPI Fearless-Dominance factor, and the Self-Report Psychopathy Scale-III (SRP-III) Interpersonal Manipulation factor, as well as with personality measures reflecting dominance, extraversion, and thrill-/adventure-seeking, and negatively with scores on measures of anxiousness and neuroticism. Scores on TriPM Meanness correlate negatively with measures of empathy and agreeableness and positively with scores on the PCL-R Affective facet, the PPI Coldheartedness and Machiavellian Egocentricity scales, the SRP-III Interpersonal Manipulation and Callous Affect scales, the LSRP Primary scale, and trait measures of callous-unemotionality and narcissism. TriPM Disinhibition scores are negatively associated with traits of conscientiousness and planful control and positively related to scores on the PCL-R Lifestyle facet, the PPI Impulsive-Antisociality factor, the SRP-III Erratic Lifestyle factor, the LSRP Secondary scale, and trait measures of impulsiveness, stimulation seeking, boredom proneness, and distress/dysphoria.

Other recent research studies using a consensus-based rating approach have demonstrated that the triarchic model domains can be effectively operationalized using items from existing psychopathy inventories. Two such efforts have focused on development of triarchic scales from the PPI (Hall et al., 2014; Lilienfeld & Andrews, 1996) and the Youth Personality Traits Inventory (YPI; Drislane et al., 2015). As an initial step in each case, doctoral-level researchers rated individual items from the chosen inventory for conceptual proximity to the triarchic model domains. Next, the provisional scales were refined through internal psychometric analyses directed at optimizing item specificity (i.e., selective convergence with targeted scale) and maximizing internal consistency. As a final step, the resultant triarchic scales (PPI-Tri, YPI-Tri) were evaluated for convergent and discriminant validity in relation to other psychopathy inventories and personality measures, in the manner described earlier for the TriPM scales.

From a theoretical standpoint, the use of a conceptual, rating-based approach to develop these alternative scale measures serves to illustrate the “open” (Meehl, 1986) quality of the triarchic model constructs. Rather than using specific existing operationalizations (e.g., the TriPM scales) as fixed criteria for developing new scales, the conceptual-rating approach permits the content coverage of new scales to vary as a function of differences in thematic coverage of items across differing source inventories. Observed variations in item content across alternative scale operationalizations can serve to highlight previously untapped, underrepresented, or perhaps less essential aspects of target constructs—and in this way help refine ideas about the nature and scope of the constructs themselves.

### *Minnesota Multiphasic Personality Inventory–2–Restructured Form*

Along with existing psychopathy inventories, omnibus personality instruments that include coverage of psychopathy-related traits or tendencies might also serve as sources of items for development of triarchic psychopathy model scales. The current study sought to extend the measurement of the triarchic psychopathy constructs using the Minnesota Multiphasic Personality Inventory–2–Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008), a 338-item self-report inventory linked conceptually and empirically to models of psychopathology and personality (see Ben-Porath, 2012, for a review). There are advantages to using the MMPI-2-RF as a basis for operationalizing the triarchic psychopathy domains. First, the original MMPI-2, which includes the items used to score the MMPI-2-RF scales, is unrivaled in its extent of use in clinical and forensic/correctional settings (Archer, Buffington-Vollum, Stredny, & Handel, 2006; Camara, Nathan, & Puente, 2000). This widespread availability can provide opportunities to measure psychopathy in

settings where instruments such as the TriPM, PPI, or YPI are not commonly used. Moreover, MMPI-2/MMPI-2-RF scores are included in an extensive range of archival databases that could be used for psychopathy research, including databases for specialized samples such as clinic patients or adult twins, and occupational groups in which psychopathic tendencies of certain types might show elevated prevalence (e.g., law enforcement agents, military personnel). Finally, the MMPI-2-RF has embedded and well-validated validity scales to detect under- and overreporting of psychopathology (e.g., Burchett & Bagby, 2014), which is important, given concerns about the veracity of responding among those high on psychopathy (see, e.g., Sellbom, Lilienfeld, Fowler, & McCrary, in press). As such, the utility of MMPI-RF–based psychopathy measures would extend to both clinical and research contexts.

The MMPI-2-RF has already been examined in the context of psychopathy assessment with promising results. Sellbom et al. (2012; Phillips, Sellbom, Ben-Porath, & Patrick, 2014) developed regression-based estimates of psychopathy factors represented in the PPI, which demonstrate good construct validity. For instance, within correctional, forensic, mental health, and university samples, MMPI-2-RF-estimated Fearless-Dominance and Impulsive-Antisociality show associations with a range of psychopathy measures and personality scales that coincide with extant PPI research (Phillips et al., 2014; Sellbom et al., 2012; see also Kastner & Sellbom, 2012; Rock, Sellbom, Ben-Porath, & Salekin, 2013). Based on evidence that the triarchic model constructs effectively incorporate tendencies encompassed by fearless-dominance and impulsive-antisociality, while also providing for distinct representation of meanness (Hall et al., 2014; Sellbom & Phillips, 2013), we sought to develop triarchic scales using items from the MMPI-2-RF.

We considered it important in particular to provide for measurement of meanness as distinguished from disinhibition, given the prominent emphasis on callous-unemotional tendencies in the child psychopathy literature (Frick & Marsee, 2006) and in personality-oriented perspectives on adult psychopathy (Lynam & Derefinko, 2006). Regarding prospects for achieving this, Sellbom, Ben-Porath, and Stafford (2007) showed in a forensic sample that Restructured Clinical Scale 4 (RC4; Antisocial Behavior) was substantially associated with scores on the PCL–Screening Version, which like the PCL-R contains substantial representation of meanness (Venables et al., 2014; Wall et al., 2015). Other studies have shown that this and certain other MMPI-2-RF scales evidence moderate to large correlations with scales known to correlate with TriPM Meanness (Drislane et al., 2014; Sellbom & Phillips, 2013)—including PPI Machiavellian Egocentricity and Coldheartedness scales, LSRP Egocentricity and Callousness scales, and SRP-III Interpersonal Manipulation and Callous Affect

scales (Kastner, Sellbom, & Lilienfeld, 2012; Neal & Sellbom, 2012; Sellbom, 2011; Sellbom, Ben-Porath, Lilienfeld, Patrick, & Graham, 2005). Taken together, these findings indicate significant promise that the MMPI-2-RF item pool could be used to develop effective scale measures of the triarchic model constructs.

## Current Study

The current investigation had two broad aims. First, in Study 1, we sought to develop item-based MMPI-2-RF scales for indexing boldness, meanness, and disinhibition, using a construct-based item selection method shown to be effective in prior triarchic scale development work (Drislane et al., 2015; Hall et al., 2014). Internal psychometric analyses of data from two very large samples (correctional, university) were used to refine the scales.

Second, in Study 2, we sought to elaborate on the construct validity of the resulting MMPI-2-RF triarchic scales in samples for which TriPM scores and other conceptually relevant psychopathy criteria were available. In addition to explicit psychopathy measures, we also selected three highly relevant personality scales that measure distinct aspects of the broader psychopathy construct (callous-unemotional traits, narcissism, and Machiavellianism, often referred to as the “dark triad”; see Glenn & Sellbom, 2014). We hypothesized, on the basis of both conceptual formulation and empirical findings reviewed earlier (e.g., Drislane et al., 2014, 2015; Hall et al., 2014; Patrick, 2010b; Sellbom & Phillips, 2013; Stanley et al., 2013), that (a) MMPI-2-RF Boldness would show preferential associations with other boldness measures (TriPM, PPI), SRP-II Factor 1 (affective-interpersonal), and narcissism; (b) MMPI-2-RF Meanness would be related positively and distinctively to other meanness measures (TriPM, PPI), LSRP Primary, SRP-II Factor 1, and stand-alone scale measures of callous-unemotional traits and Machiavellianism; and (c) MMPI-2-RF Disinhibition would show preferential positive relations with other disinhibition measures (TriPM, PPI), LSRP Secondary, APSD Impulsivity, and SRP-II Factor 2 (social deviance). Finally, we examined whether the new MMPI-2-RF triarchic scales would increment standard MMPI-2-RF scale scores in the prediction of TriPM scores. Such analyses are quite important to ascertain whether new scales will add useful information above and beyond what one would obtain from standard scales, as well as to avoid a proliferation of new MMPI-2-RF scales of dubious value (see, e.g., Butcher, Graham, & Ben-Porath, 1995).

## Study 1: Development

### Method

**Participants and Procedures.** We used two participant samples for development of the MMPI-2-RF-Tri scales to ensure

inclusion of items that would operate effectively across clinical-forensic and nonclinical respondents. The first development sample consisted of 51,903 inmates who completed the MMPI-2 upon entry into the Ohio Department of Rehabilitation and Correction system between 1992 and 1996. Participants with invalid MMPI-2-RF profiles (Variable Response Inconsistency- $r > 80T$ , True Response Inconsistency- $r > 80T$ , Infrequent Responses = 120T, Infrequent Psychopathology Responses- $r > 100T$ ) due to excessive inconsistent or exaggerated responding were excluded (18.6%). The final sample consisted of 34,936 men and 7,354 women. Participants had a mean age of 29.80 ( $SD = 9.70$ ), ranging from 18 to 86. Racial/ethnic composition was primarily African American (54%) or Caucasian (45%). The median level of education was 12 years, with 60% completing at least high school requirements. Most were single/never married (55%), married (23%), or divorced (14%).

The second development sample consisted of 1,535 university students enrolled in introductory psychology courses. Data for these participants derived from various MMPI-2-RF administrations performed at Kent State University and the University of Alabama. We applied the same MMPI-2-RF exclusionary criteria as for the correctional sample, which led to the exclusion of 204 participants (13%). The final sample consisted of 508 men and 823 women. The mean age of the sample was 19.58 years ( $SD = 3.11$ , ranging from 18-56 years). The sample was primarily White (87%); 8% were African Americans and 6% other or “mixed” race or ethnicity.

**Measure.** The MMPI-2-RF (Ben-Porath & Tellegen, 2008) was described in detail earlier. MMPI-2-RF item responses were derived from MMPI-2 administrations. Empirical research has shown that MMPI-2-RF scale scores can be extracted from the MMPI-2 with no decrement in psychometric functioning (Tellegen & Ben-Porath, 2008; Van Der Heijden, Egger, & Derksen, 2010).

**Scale Construction.** Consistent with procedures used by Hall et al. (2014) and Drislane et al. (2015) in developing Triarchic scales from the PPI and YPI, construction of the MMPI-2-RF-Tri scales proceeded in four phases: (a) a development phase for the selection of candidate items, (b) a refinement phase, (c) a psychometric evaluation phase (see “MMPI-2-RF-Tri Scale Psychometrics in Development Samples” in the Results section), and (d) a final content evaluation phase (see “Item Content of Final MMPI-2-RF-Tri Scales” in the Results section).

**Development and candidate item selection phase.** The MMPI-2-RF items were rated by four clinical psychology graduate students familiar with the construct of psychopathy. To guide their ratings, the raters were provided with narrative descriptions of the boldness, meanness, and disinhibition facets of psychopathy as described in the triarchic

model conceptualization article (Patrick et al., 2009).<sup>2</sup> For each item, raters were asked to indicate the extent to which that item reflected one or another of the triarchic model constructs. This rating process was completed separately for each construct, such that each MMPI-2-RF item was rated three times. Items were rated based on internal content alone, as raters were provided with no information regarding the loading of items onto particular MMPI-2-RF scales. Raters evaluated the degree of relevance of each item of the MMPI-2-RF to a given triarchic model facet using a selection of five choices: unrelated to the construct, strongly represents HIGH levels of the construct, somewhat represents HIGH levels of the construct, somewhat represents LOW levels of the construct, and strongly represents LOW levels of the construct.

Candidate items for the MMPI-2-RF-Tri scales were then identified based on the level of agreement across raters for each item. Items that were rated as strongly related to high or low levels of a construct by at least three of four raters were selected as initial scale indicators. Items that had been rated as strongly indexing the low pole of boldness, meanness, or disinhibition were reverse scored prior to being included as scale indicators. In some cases, items were rated as equally relevant to two different triarchic facets (e.g., items indexing interpersonal exploitation were rated as relevant to both boldness and meanness, whereas items indexing hostility were rated as relevant to both meanness and disinhibition). Such items were not included as initial candidate items but were evaluated empirically for inclusion in particular scales during the scale refinement phase (see the next section). In total, there were 19 initial candidate items for the Boldness scale, 21 for the Meanness scale, and 17 for the Disinhibition scale.

**Refinement phase.** After selection of candidate items, the MMPI-2-RF-Tri scales underwent a process of refinement. The items comprising the provisional scales were evaluated in terms of adjusted item–total correlations with other candidate items from the target scale, relative to correlations with nontarget scales. As mentioned earlier, one of the aims of the present study was to operationalize the triarchic model constructs as distinctly as possible using MMPI-2-RF items. As such, items were deleted from target scales if they showed stronger correlations with nontarget than target scales, or if they increased the intercorrelation of MMPI-2-RF-Tri scales (Meanness and Disinhibition, in particular) to an unacceptable level (i.e., exceeding those for TriPM, PPI, and YPI scale operationalizations). Additionally, items that demonstrated weak item–total correlations with other candidate items from the target scale were removed if their deletion improved scale homogeneity as measured by Cronbach’s alpha. These initial analyses led to the elimination of six candidate items from Disinhibition, two items from Boldness, and one item from Meanness.

Next, after eliminating nonoptimal candidate items, other available MMPI-2-RF items were evaluated for possible inclusion. At this stage of scale development, the level of rating consensus was relaxed somewhat (i.e., items needed to have been rated as *strongly* related to the target construct by at least two of the raters, and as *somewhat* related by the remaining raters), since refined scales consisting of items with maximal consensus were available as empirical referents. The content of items was closely examined by the authors during this stage of scale refinement. Items deemed to reflect noncentral features or clinical correlates of the triarchic model facets (e.g., problematic substance use, suicidality) were not included. Potential replacement items were evaluated one by one and in terms of corrected item–total correlations and nontarget scale correlations. Replacement items were retained only if they improved scale homogeneity and did not unduly influence the correlations between MMPI-2-RF-Tri scales. At this point, items that had initially been rated as relevant to more than one triarchic facet were also evaluated for possible inclusion and were retained if the item displayed preferential empirical associations (high corrected item–total correlation) with one target scale over the other. Likewise, prior to finalizing the item set of each scale, initial candidate items that had been previously dropped following the first phase of psychometric evaluation were reassessed for possible inclusion in the revised scales, which now contained replacement items. Potential replacement items were separately evaluated in both development samples to ensure optimal effectiveness. In total, six replacement items were added to the Meanness scale, four to the Boldness scale, and two to the Disinhibition scale. The final quantities of items for the three MMPI-2-RF scales were thus: Boldness, 21 items (5 keyed “false”); Meanness, 26 items (all keyed “true”); and Disinhibition, 13 items (3 keyed “false”). Table 1 lists the MMPI-2-RF item numbers for items comprising each of the final MMPI-2-RF-Tri scales along with their original MMPI-2-RF scale designations.

## Results

### *Item Content of Final MMPI-2-RF-Tri Scales*

The final MMPI-2-RF-Tri scales are composed of items drawn from a range of MMPI-2-RF Higher Order, RC, Specific Problems (SP), and Personality Psychopathology Five (PSY-5) scales. The items comprising MMPI-2-RF Boldness are highly consistent with the theoretical conception of this construct as described by Patrick et al. (2009), as represented in Cleckley’s description of psychopathy, and in items associated with the Fearless Dominance factor of the PPI (Lilienfeld & Andrews, 1996; Lilienfeld & Widows, 2005). MMPI-2-RF Boldness is delineated by items indexing social poise, confidence, and leadership (e.g., “with opportunity, could lead people well”; aggressiveness [AGGR], low

**Table 1.** List of Items Comprising the Final MMPI-2-RF-Tri Scales.

Item no.	MMPI-2-RF scale
<b>Boldness</b>	
109	SAV <sup>a</sup> , INTR <sup>a</sup>
114 (F)	EID <sup>a</sup> , SHY <sup>a</sup>
147	IPP <sup>a</sup> , AGGR
182	L-r, RC2 <sup>a</sup> , AGGR
226	BXD, MEC, DISC
234	FBS-r, EID <sup>a</sup> , STW <sup>a</sup> , NEGE <sup>a</sup>
239	IPP <sup>a</sup> , AGGR
244	RC9
246	EID <sup>a</sup> , RC2 <sup>a</sup> , INTR <sup>a</sup>
249 (F)	SHY <sup>a</sup>
24 (F)	RBS <sup>a</sup> , IPP <sup>a</sup> , AGGR
276	IPP <sup>a</sup> , AGGR
302	RC2 <sup>a</sup> , IPP <sup>a</sup> , AGGR
322 (F)	K-r <sup>a</sup> , EID <sup>a</sup> , RC7 <sup>a</sup>
37	EID <sup>a</sup> , NEGE <sup>a</sup>
42	MEC, DISC
48 (F)	EID <sup>a</sup> , RCd <sup>a</sup> , SFD <sup>a</sup>
64	EID <sup>a</sup> , RC2 <sup>a</sup> , INTR <sup>a</sup>
73	EID <sup>a</sup> , STW <sup>a</sup> , NEGE <sup>a</sup>
91 (F)	EID <sup>a</sup> , RC7 <sup>a</sup> , SHY <sup>a</sup>
94	SAV <sup>a</sup>
<b>Meanness</b>	
104	IPP <sup>a</sup> , AGGR
142	RC3
143	RC9
148	MEC
185	RC3
213	RC3
255	Fp-r
256	RC9, AGGR
292	BXD, RC9, DISC
300	MEC, DISC
305	RC9
316	BXD, RC9, AGG, AGGR
321	IPP <sup>a</sup> , AGGR
327	RC9, IPP <sup>a</sup> , AGGR
329	BXD, RC4, AGG, AGGR
36	FBS-r, K-r <sup>a</sup> , RC3,
39	RC9, AGGR
55	FBS-r, RC3
84	BXD, RC9, AGG, AGGR
87	RC3
97	RC9
99	FBS-r, K-r <sup>a</sup> , RC3
26	RBS, RC9, AGG, AGGR
41	Fp-r, AGG
231	F-r, BXD, RC9, AGG, AGGR
236	DSF
<b>Disinhibition</b>	
131	RBS, BXD, RC9, DISC
156	FBS-r, RBS, BXD, RC4, DISC

(continued)

**Table 1. (continued)**

Item no.	MMPI-2-RF scale
190 (F)	BXD, RC4, DISC
205	BXD, RC4, JCP, DISC
21	RBS, BXD, RC4, JCP
212 (F)	THD, RC6
218	F-r, RC4
221 (F)	Fp-r
223	BXD, RC4, JCP, DISC
253	F-r, BXD, RC4, JCP, DISC
45	FBS-r <sup>a</sup> , L-r <sup>a</sup>
66	BXD, RC4, JCP, DISC
96	BXD, RC4, JCP

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Note. MMPI-2-RF = Minnesota Multiphasic Personality Inventory–2–Restructured Form; SAV = social avoidance; INTR = introversion/low positive emotionality; EID = emotional/internalizing dysfunction; SHY = shyness; IPP = interpersonal passivity; AGGR = aggressiveness; L-r = uncommon virtues; RC = Restructured Clinical Scale; RC2 = low positive emotions; BXD = behavioral/externalizing dysfunction; MEC = mechanical-physical interests; DISC = disconstraint; FBS-r = symptom validity; STW = stress/worry; NEGE = negative emotionality/neuroticism; RC9 = hypomanic activation; RBS = response bias; K-r = adjustment validity; RC7 = dysfunctional negative emotions; RCd = demoralization; SFD = self-doubt; RC3 = cynicism; Fp-r = infrequent psychopathology responses; AGG = aggression; RC4 = antisocial behavior; F-r = infrequent responses; DSF = disaffiliativeness; JCP = juvenile conduct problems; THD = thought dysfunction; RC6 = ideas of persecution.

<sup>a</sup>Item is scored in the opposite direction on indicated MMPI-2-RF Scale.

social avoidance [SAV], shyness [SHY], interpersonal passivity [IPP], and introversion/low positive emotionality [INTR]), emotional resilience (e.g., “very sensitive to criticism” [false]; reversed emotional/internalizing dysfunction [EID], low positive emotions [RC2], dysfunctional negative emotions [RC7], stress/worry [STW], and negative emotionality/neuroticism [NEGE]), and fearless tendencies (e.g., “would like to race cars”; behavioral/externalizing dysfunction [BXD], disconstraint [DISC], and low multiple specific fears [MSF]). By contrast, MMPI-2-RF Meanness reflects callous-aggressive tendencies through items indexing physical aggression and roughness (e.g., “like making people afraid of me”; hypomanic activation [RC9], BXD, aggression [AGG], and AGGR), interpersonal antagonism (e.g., “often make special effort to win argument”; RC9, AGGR, and reversed interpersonal passivity [IPP]), and cynical/misanthropic attitudes (e.g., “people have friends because they are useful”; cynicism [RC3] and disaffiliativeness [DSF]). Finally, the MMPI-2-RF Disinhibition Scale reflects irresponsible, externalizing behaviors (e.g., “never been in trouble with the law” [false]; antisocial behavior [RC4], BXD, DISC, and juvenile conduct problems [JCP]), alienation (e.g., “no enemies who wish me harm” [false]; ideas of persecution [RC6]), impulsivity (e.g., “when bored, stir things up”; BXD, RC9, and DISC), and dishonesty.<sup>3</sup>

## MMPI-2-RF-Tri Scale Psychometrics in Development Samples

The intercorrelations for MMPI-2-RF Boldness and Meanness were .19 in the university development sample and .13 in the correctional development sample; for Boldness and Disinhibition,  $r$ s were .08 in the university sample and  $-.04$  in the correctional sample; and for Meanness and Disinhibition,  $r$ s were .48 in the university sample and .47 in the correctional sample. These scale intercorrelations are generally consistent with those for counterpart subscales of the TriPM (Driscoll et al., 2014; Sellbom & Phillips, 2013). Internal consistencies were .75 (correctional) and .79 (university) for Boldness, .79 and .78 for Meanness, and .71 and .66 for Disinhibition.<sup>4</sup>

Finally, we also calculated zero-order correlations between the MMPI-2-RF-Tri and standard MMPI-2-RF scale scores. These are reported in online supplemental Tables S1 and S2 (The online supplemental material is available at <http://asm.sagepub.com/supplemental>). In general, overall results were as expected. MMPI-2-RF Boldness exhibited large negative correlations with MMPI-2-RF scales measuring negative emotionality, social disengagement/anxiety, unassertiveness, low self-esteem, and inefficacy, whereas it exhibited large positive correlations with scales reflecting social dominance and grandiosity. MMPI-2-RF Meanness showed large positive correlations with MMPI-2-RF scales indexing cynicism, interpersonal aggression, grandiosity, hostility, anger proneness, and general externalizing. MMPI-2-RF Disinhibition displayed large positive correlations with other MMPI-2-RF measures of impulsivity, sensation seeking, and general externalizing.

## Study 2: Validation

The second study focused on the external validation of the resulting MMPI-2-RF-Tri scales. For purposes of validation, we used two other archival participant samples representing institutional and noninstitutional settings in which data for the MMPI-2-RF, TriPM, and other psychopathy-relevant criterion measures were available.

## Method

### Participants and Procedures

**Correctional Sample.** Participants in this validation sample were 209 women from a Midwestern state correctional facility who completed questionnaire measures in a group format. These participants had valid MMPI-2-RF profiles based on the same exclusionary criteria as listed in Study 1. Study participation was voluntary, and there were no direct incentives for participation. Volunteers were screened prior to their participation to determine if they met the minimum

criteria of an eighth-grade reading level. The sample ranged in age from 18 to 61 years ( $M = 27.47$ ,  $SD = 2.45$ ). Participants were mostly Caucasian (80%), with approximately 19% African American and 1% Native American or Latino. The women were incarcerated at various security levels, ranging from minimum to closed, and for a broad range of offenses, with approximately 29% convicted for homicide-related crimes, 19% for other violence-related offenses, 17% for drug-related crimes, and 15% for theft-related offenses.

**University Sample.** The university validation sample consisted of 327 undergraduate students from a large Southeastern university who participated in research for course credit. This sample was a subset of a larger data set (see Marion et al., 2013; Sellbom & Phillips, 2013), consisting of participants who had been administered the MMPI-2-RF under standard instructions. As with the correctional sample, individuals with excessive random or exaggerated responding were excluded based on the same exclusionary criteria as listed in Study 1, leaving a final sample of 112 men and 166 women. Participants ranged in age from 17 to 40 years ( $M = 19.12$ ,  $SD = 1.43$ ). Most were Caucasian (86%) with about 10% African American and the remainder, roughly 4%, from other or mixed ethnic backgrounds.

### Measures: Both Validation Samples

**Minnesota Multiphasic Personality Inventory–2–Restructured Form.** The MMPI-2-RF was described earlier. We computed scores for the MMPI-2-RF-Tri scales in each of the samples.

**Triarchic Personality Measure.** The TriPM (Patrick, 2010b) is a 58-item self-report inventory of psychopathy. Participants respond to each item on a 4-point Likert-type scale, ranging from 0 to 3 (0 = *false*, 1 = *mostly false*, 2 = *mostly true*, 3 = *true*). Unlike the PCL-R and the PPI, the TriPM is typically examined not in terms of total scores but in terms of scores on its three facet scales—Boldness, Meanness, and Disinhibition). Internal consistency reliabilities (Cronbach's alpha) for these scales in the two validation samples (correctional/university) were .89/.82, .90/.88, and .89/.84., respectively.

**Psychopathic Personality Inventory/Psychopathic Personality Inventory–Revised.** The PPI (Lilienfeld & Andrews, 1996) and the PPI-R (Lilienfeld & Widows, 2005) are self-report inventories designed to assess various personality features associated with historical conceptions of psychopathy (e.g., Cleckley, 1941, 1976; Karpman, 1941; Lykken, 1957). In an effort to improve measurement efficiency, the PPI-R was reduced to 154 items (from 187 in the original PPI). The PPI and the PPI-R can be used to score the triarchic domains as reviewed earlier (Hall et al., 2014), and we therefore used

those scores for validation purposes here. Independent research has shown additional evidence for their validity (Sellbom, Wygant, & Drislane, 2015). Internal consistencies (Cronbach's alpha) across samples and scale scores ranged from .70 (for PPI-Tri Disinhibition in the university sample) to .85 (for PPI total score in the correctional sample).

**Levenson's Self-Report Psychopathy Scale.** The LSRP (Levenson et al., 1995), designed to assess similar domains as the PCL-R (Hare, 1991), consists of 26 items answered on a scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Its items are organized into Primary and Secondary psychopathy subscales with extensive validity (e.g., Salekin, Chen, Sellbom, Lester, & MacDougall, 2014; see Sellbom et al., in press, for a review).<sup>5</sup> Internal consistencies (Cronbach's alpha) across samples and score variables ranged from .68 (LSRP Secondary in prison sample) to .86 (LSRP Total score in university sample).

### Measures: Correctional Sample

**Machiavellianism Inventory—Version IV.** The Machiavellianism Inventory—Version IV (MACH-IV; Christie & Geis, 1970) is a 20-item scale that measures attitudes and behaviors associated with the Machiavellian personality construct. Machiavellianism correlates moderately with psychopathy and narcissism (Paulhus & Williams, 2002). Internal consistency (Cronbach's alpha) within the correctional validation sample was .67.

**Narcissistic Personality Inventory.** The Narcissistic Personality Inventory (Raskin & Terry, 1988) consists of 40 items designed to measure narcissistic personality disorder as represented in *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., *DSM-III*; American Psychiatric Association, 1980). This measure has been found to be highly associated with measures of interpersonal dominance and observer ratings of narcissism, self-confidence, and self-centeredness (Raskin & Terry, 1988). Internal consistency (Cronbach's alpha) within the correctional validation sample was .92.

### Measures: University Sample

**Antisocial Process Screening Device—Youth Version.** The APSD—Youth Version (APSD-YV; Caputo, Frick, & Brodsky, 1999) is a 20-item self-report version of the original, informant-rated APSD, developed as a downward extension of the PCL-R for use with children and younger adolescents. The APSD-YV yields a total score along with scores on three factors—Callous-Unemotionality, Narcissism, and Impulsivity; we used the latter two here because we also included the longer ICU (see below). Internal consistency

(Cronbach's alpha) in the university validation sample ranged from .55 (Impulsivity; brief scale; AIC = .20) to .78 (APSD total).

**Inventory of Callous-Unemotional Traits.** The ICU (Essau, Sasagawa, & Frick, 2006) is a 24-item self-report measure of callous-unemotional traits designed for use with adolescents. The measure was developed as an expansion of the callous-unemotional item subset of the original APSD, with item wordings balanced to reduce the influence of response bias. Empirical research supports its validity as a measure of callous-unemotional tendencies (Essau et al., 2006; Kimonis et al., 2008). We therefore used this longer and more reliable ICU scale rather than the APSD Callous-Unemotional scale. Internal consistency in the university validation sample was .82.

**Self-Report Psychopathy Scale—Version II.** The SRP-II (Hare, Harpur, & Hemphill, 1989) is a 60-item self-report measure of psychopathy. Respondents are asked to rate items using a 7-point scale (1 = *disagree strongly*, 7 = *agree strongly*). This measure is typically scored as a total score and two broad factor scores. Research has indicated that Factor 1 tends to be associated with characteristics reflective of fearlessness and boldness, whereas Factor 2 indexes traditional disinhibition traits; this measure has been criticized for poor coverage of meanness (see, e.g., Sellbom et al., in press, for a review). Internal consistency estimates (Cronbach's alpha) within the university validation sample ranged from .70 (SRP-II Factor 1) to .88 (SRP-II Total).

## Results

We conducted several analyses to examine the psychometric properties of the MMPI-2-RF-Tri scale scores in the two validation samples. First, we examined internal reliability and intercorrelations among the scales. Second, we examined criterion-related validity, which included correlation, regression, and confirmatory factor analyses. Finally, we examined incremental validity above and beyond standard MMPI-2-RF scale scores.

### MMPI-2-RF-Tri Scale Psychometrics in Validation Samples

Intercorrelations among the three MMPI-2-RF-Tri scales in the university and correctional samples, respectively, were as follows: Boldness and Meanness, .31 and .02; Boldness and Disinhibition, .17 and .06; and Meanness and Disinhibition, .47 and .41. The correlation between Boldness and Meanness in the female correctional sample was notably smaller than in prior studies (e.g., Drislane et al., 2014) and also small in comparison with the *r* for the large (predominantly male) correctional sample of current



**Table 2.** Zero-Order Correlations and Multiple Regression Betas for MMPI-2-RF-Tri Scales as Predictors of Psychopathy-Relevant Criterion Measures in Correctional Validation Sample.

Criterion Measures	MMPI-2-RF-Tri scores				R <sup>2</sup>
	Total	Boldness, <i>r</i> / $\beta$	Meanness, <i>r</i> / $\beta$	Disinhibition, <i>r</i> / $\beta$	
TriPM Total	<b>.72*</b>	<b>.41*/.38*</b>	<b>.48*/.30*</b>	<b>.58*/.44*</b>	.55*
TriPM Boldness	<b>.43*</b>	<b>.79*/.80*</b>	-.01/-.01	-.02/-.06	.64*
TriPM Meanness	<b>.58*</b>	.14/.11	<b>.57*/.47*</b>	<b>.45*/.25*</b>	.39*
TriPM Disinhibition	<b>.39*</b>	-.11/-.15	<b>.39*/.15</b>	<b>.64*/.59*</b>	.46*
PPI Total	<b>.69*</b>	<b>.33*/.31*</b>	<b>.51*/.34*</b>	<b>.56*/.41*</b>	.50*
PPI Boldness	<b>.44*</b>	<b>.54*/.54*</b>	.04/-.14	.12/.02	.31*
PPI Meanness	<b>.50*</b>	.18/.16	.29*/.18	<b>.34*/.25*</b>	.18*
PPI Disinhibition	.20*	-.20/-.23*	<b>.36*/.22</b>	<b>.44*/.36*</b>	.29*
LSRP Total	<b>.55*</b>	.06/.03	<b>.57*/.44*</b>	<b>.50*/.32*</b>	.41*
LSRP Primary	<b>.55*</b>	.17/.14	<b>.52*/.43*</b>	<b>.40*/.22*</b>	.34*
LSRP Secondary	<b>.35*</b>	-.23*/-.25*	<b>.44*/.29*</b>	<b>.48*/.36*</b>	.35*
MACH-IV Total	<b>.32*</b>	-.22*/-.23*	<b>.55*/.52*</b>	.29*/.09	.36*
NPI Total	<b>.59*</b>	<b>.63*/.62*</b>	.26*/.19*	.25*/.13	.47*

Note. MMPI-2-RF = Minnesota Multiphasic Personality Inventory–2–Restructured Form; TriPM = Triarchic Psychopathy Measure; PPI = Psychopathic Personality Inventory; LSRP = Levenson's Self-Report Psychopathy Scale; MACH-IV = Machiavellianism Inventory–Version IV; NPI = Narcissistic Personality Inventory. *N* = 209. Zero-order correlation coefficients and standardized beta-weights in boldface are of at least moderate effect size (.30). MMPI-2-RF-Tri total score = sum of scores for Boldness, Meanness, and Disinhibition scales.

\**p* < .004.

Study 1. Internal consistencies were .77 (correctional) and .76 (university) for Boldness, .78 and .76 for Meanness, and .68 and .67 for Disinhibition.

### Criterion-Related Validity of MMPI-2-RF-Tri Scales

We report zero-order correlations between MMPI-2-RF-Tri scales and criterion measures, along with standardized beta coefficients from regression analyses using the three MMPI-2-RF-Tri scales as concurrent predictors of the various criterion measures (i.e., to quantify the unique contribution of each MMPI-2-RF-Tri scale prediction). To control for the number of analyses performed, we used conservative significance values of .004 (.05/13 criteria) and .003 (.05/18 criteria) for the correctional and university validation samples, respectively. Due to shared method variance among self-report inventories, we emphasized correlation coefficients representing a medium effect size (.30) or larger. These coefficients are shown in Table 2 (correctional sample) and Table 3 (university sample); also shown are correlations for MMPI-2-RF-Tri total scores, computed as the sum across the three scales, with each criterion variable.

MMPI-2-RF-Tri Total scores evidenced significant correlations with total scores for all psychopathy inventories, at effect size levels corresponding to the degree of representation of the triarchic model constructs in each inventory (see also Drislane et al., 2014; Sellbom & Phillips, 2013). Correlations with total scores on psychopathy inventories

that include salient representation of all three triarchic constructs—namely, the TriPM, PPI/PPI-R, and SRP-II (university sample)—were large in magnitude (.68-.76); *r*s with total scores on the LSRP and APSD (university sample), which contain representation of meanness and disinhibition but not boldness, were smaller but still large (.52-.55).

With regard to narrower facet scores from the various psychopathy inventories and scores on other psychopathy-relevant measures, the MMPI-2-RF-Tri scale scores evinced conceptually expected results, with only a few exceptions. As predicted, the MMPI-2-RF Boldness scale showed primary associations with TriPM Boldness, PPI/PPI-R Boldness, SRP-II Factor 1, and Narcissistic Personality Inventory Total score. MMPI-2-RF Meanness exhibited robust associations, as predicted, with TriPM Meanness, PPI/PPI-R Meanness (though to a lesser degree in the correctional sample), LSRP Primary, APSD Narcissism, and Machiavellianism, and to a slightly lesser degree, the ICU. MMPI-2-RF Meanness also evinced a small unique association with SRP-II Factor 2 beyond Disinhibition, which suggests that such measurement is embedded within this factor, rather than the traditional Factor 1, on the SRP-II. Finally, MMPI-2-RF Disinhibition exhibited its largest associations, as expected, with TriPM Disinhibition, PPI/PPI-R Disinhibition, LSRP Secondary, APSD Impulsivity, and SRP-II Factor 2. Contrary to expectations, Disinhibition also correlated at levels at least comparable to MMPI-2-RF Meanness with PPI Meanness (in the correctional sample) and ICU (in the university sample).<sup>6</sup>

**Table 3.** Zero-Order Correlations and Multiple Regression Betas for MMPI-2-RF-Tri Scales as Predictors of Psychopathy-Relevant Criterion Measures in University Validation Sample.

Criterion Measures	MMPI-2-RF-Tri scores				$R^2$
	Total	Boldness, $r/\beta$	Meanness, $r/\beta$	Disinhibition, $r/\beta$	
TriPM Total	<b>.76*</b>	<b>.71*/.34*</b>	<b>.85*/.30*</b>	<b>.63*/.32*</b>	.62*
TriPM Boldness	<b>.55*</b>	<b>.73*/.72*</b>	.27*/.04	.16/.01	.54*
TriPM Meanness	<b>.63*</b>	<b>.34*/.16</b>	<b>.59*/.42*</b>	<b>.48*/.26*</b>	.43*
TriPM Disinhibition	<b>.43*</b>	.00/-.17*	<b>.42*/.19*</b>	<b>.68*/.62*</b>	.50*
PPI-R Total	<b>.68*</b>	<b>.48*/.34*</b>	<b>.52*/.24*</b>	<b>.54*/.37*</b>	.49*
PPI-R Boldness	<b>.51*</b>	<b>.69*/.68*</b>	.24*/.02	.13/.00	.48*
PPI-R Meanness	<b>.41*</b>	.24*/.12	<b>.40*/.30*</b>	.28*/.12	.18*
PPI-R Disinhibition	.26*	-.11/-.24*	.29*/.17	<b>.50*/.43*</b>	.28*
SRP-II Total	<b>.71*</b>	<b>.42*/.25*</b>	<b>.60*/.33*</b>	<b>.61*/.41*</b>	.55*
SRP-II Factor 1	<b>.47*</b>	<b>.61*/.61*</b>	.21/-.04	.21/.11	.39*
SRP-II Factor 2	<b>.61*</b>	.29*/.12	<b>.51*/.24*</b>	<b>.63*/.50*</b>	.47*
LSRP Total	<b>.51*</b>	.13/-.06	<b>.54*/.40*</b>	<b>.51*/.34*</b>	.38*
LSRP Primary	<b>.51*</b>	.22*/.06	<b>.50*/.37*</b>	<b>.44*/.26*</b>	.31*
LSRP Secondary	<b>.31*</b>	-.08/-.23	<b>.38*/.29*</b>	<b>.45*/.36*</b>	.29*
APSD Total	<b>.54*</b>	.14/-.05	<b>.54*/.35*</b>	<b>.59*/.43*</b>	.44*
APSD Narcissism	<b>.46*</b>	.16/-.00	<b>.48*/.38*</b>	<b>.39*/.21*</b>	.27*
APSD Impulsivity	<b>.34*</b>	.00/-.13	<b>.35*/.19*</b>	<b>.50*/.43*</b>	.28*
ICU Total	<b>.34*</b>	.10/-.06	<b>.36*/.23*</b>	<b>.38*/.28*</b>	.20*

Note. MMPI-2-RF = Minnesota Multiphasic Personality Inventory–2–Restructured Form; TriPM = Triarchic Psychopathy Measure; PPI = Psychopathic Personality Inventory; LSRP = Levenson's Self-Report Psychopathy Scale; APSD = Antisocial Process Screening Device; SRP-II = Self-Report Psychopathy Scale–II; ICU = Inventory of Callous-Unemotional Traits.  $N = 278$ . Zero-order correlation coefficients and standardized beta-weights in boldface are of at least moderate effect size (.30).

\* $p < .003$ .

In a summative effort to evaluate criterion-related validity, we estimated a latent measurement model in which MMPI-2-RF-Tri, PPI-Tri, and TriPM scales served as indicators for respective latent constructs representing boldness, meanness, and disinhibition. Because of its larger size and mixed-gender nature, we confined these analyses to the undergraduate sample. Maximum likelihood estimation was used, and model fit was acceptable (comparative fit index = .96, Tucker-Lewis-Index = .94, root mean square error of approximation = .09, standardized root mean square residual = .07); standardized factor loadings were large (all  $\lambda$ s > .59,  $ps < .001$ ) for all measures.

### Incremental Validity

Finally, we estimated hierarchical regression models to determine whether each MMPI-2-RF-Tri scale would add above and beyond one or more standard MMPI-2-RF scale(s) in predicting corresponding TriPM scale scores. To avoid an inordinate amount of item overlap, to respect the hierarchical organization of MMPI-2-RF interpretation, and to preserve some level of statistical power, we estimated a hierarchical regression model for each scale set (i.e., Higher Order, RC, SP, and PSY-5) in each sample. We selected standard MMPI-2-RF scales based on two major criteria:

(a) a large correlation with the MMPI-2-RF-Tri scale in question, and (b) a large correlation with the TriPM criterion scale, in at least one of the samples. These results are shown in Table 4. The MMPI-2-RF-Tri scales added incrementally in every analysis in predicting TriPM scores. More specifically, median  $\Delta R^2$  values of .125 (university sample) and .085 (correctional sample) for Total, .184 and .199 for Boldness, .067 and .082 for Meanness, and .062 and .089 for Disinhibition were observed. Thus, across both samples and in every analysis, the MMPI-2-RF-Tri scales added incrementally above and beyond standard MMPI-2-RF scales in predicting corresponding TriPM scale scores.

### General Discussion

The goal of the current project was to develop and validate scales for indexing the constructs of the triarchic psychopathy model using items from the MMPI-2-RF—an omnibus personality inventory frequently used for clinical purposes. Previous studies have demonstrated the effectiveness of scales developed using items from other psychopathy measures (PPI, YPI) for indexing these triarchic constructs; the current project was the first to use a measure not specifically designed to assess psychopathy. Findings for the MMPI-2-RF-Tri scales are generally consistent with results

**Table 4.** Incremental Validity of MMPI-2-RF-Tri Scales Over Standard MMPI-2-RF in Predicting TriPM Scale Scores.

MMPI-2-RF scales	University sample		Correctional sample	
	R <sup>2</sup>	ΔR <sup>2</sup>	R <sup>2</sup>	ΔR <sup>2</sup>
<b>TriPM Total score</b>				
H-O scales				
Step 1: BXD	.531**		.504**	
Step 2: RF-Tri Total	.633**	.103**	.585**	.082**
RC scales				
Step 1: RC4, RC9	.477**		.501**	
Step 2: RF-Tri Total	.625**	.148**	.589**	.088**
SP scales				
Step 1: AGG	.331**		.284**	
Step 2: RF-Tri Total	.595**	.256**	.524**	.240**
PSY-5 scales				
Step 1: AGGR-r, DISC-r	.585**		.586**	
Step 2: RF-Tri Total	.628**	.043**	.600**	.013*
<b>TriPM Boldness</b>				
H-O scales				
Step 1: EID	.370**		.466**	
Step 2: RF-Tri Boldness	.550**	.180**	.647**	.184**
RC scales				
Step 1: RCd, RC2, RC7	.358**		.439**	
Step 2: RF-Tri Boldness	.545**	.187**	.656**	.215**
SP scales				
Step 1: SFD, NFC, IPP, SHY	.489**		.619**	
Step 2: RF-Tri Boldness	.573**	.084**	.674**	.056**
PSY-5 scales				
Step 1: NEGE-r	.204**		.293**	
Step 2: RF-Tri Boldness	.547**	.340**	.640**	.351**
<b>TriPM Meanness</b>				
H-O scales				
Step 1: BXD	.367**		.278**	
Step 2: RF-Tri Meanness	.431**	.065**	.386**	.111**
RC scales				
Step 1: RC9	.249**		.352**	
Step 2: RF-Tri Meanness	.345**	.098**	.375**	.026*
SP scales				
Step 1: AGG	.328**		.291**	
Step 2: RF-Tri Meanness	.394**	.068**	.373**	.085**
PSY-5 scales				
Step 1: AGGR-r, DISC-r	.400**		.313**	
Step 2: RF-Tri Meanness	.429**	.029**	.392**	.079**
<b>TriPM Disinhibition</b>				
H-O scales				
Step 1: BXD	.399**		.387**	
Step 2: RF-Tri Disinhibition	.474**	.076**	.449**	.064**
RC scales				
Step 1: RC4, RC9	.485**		.489**	
Step 2: RF-Tri Disinhibition	.513**	.030**	.500**	.019*
SP scales				
Step 1: JCP	.438**		.300**	
Step 2: RF-Tri Disinhibition	.487**	.048**	.410**	.113**
PSY-5 scales				
Step 1: DISC-r	.297**		.315**	
Step 2: RF-Tri Disinhibition	.461**	.165**	.431**	.119**

Note. MMPI-2-RF-Tri = Minnesota Multiphasic Personality Inventory–2–Restructured Form Triarchic Scale; TriPM = Triarchic Psychopathy Measure; RF-Tri = MMPI-2-RF-Tri; H-O = higher order; RC = Restructured Clinical; SP = Specific Problems; PSY-5 = Personality Psychopathology Five; EID = emotional/internalizing dysfunction; BXD = behavioral/externalizing dysfunction; RCd = demoralization; RC2 = low positive emotions; RC4 = antisocial behaviour; RC7 = dysfunctional negative emotions; RC9 = hypomanic activation; SFD = self-doubt; NFC = inefficacy; JCP = juvenile conduct problems; AGG = aggression; IPP = interpersonal passivity; SHY = shyness; AGGR = aggressiveness; DISC = disconstraint; NEGE = negative emotionality/neuroticism.

\*p < .01. \*\*p < .001.

for these psychopathy measure-based scales (Driscoll et al., 2015; Hall et al., 2014), providing support for the notion that the triarchic model constructs can be effectively operationalized using items from omnibus inventories of personality or personality pathology as well as psychopathy-specific inventories. More specifically, the MMPI-2-RF-Tri scales demonstrated acceptable internal consistency reliabilities and intercorrelations roughly matching those for the TriPM subscales. In addition, with a few exceptions, these new scales showed expected patterns of convergent and discriminant validity with extant psychopathy measures and other psychopathy-relevant criterion variables. The magnitudes of many of the convergent correlations were particularly encouraging given that correlation coefficients of .60 and larger indicate strong similarity between underlying scale constructs, given that the possible maximum correlations were constrained by reliability (e.g., the disattenuated [due to unreliability] correlation between TriPM and MMPI-2-RF Boldness is .90 in the university sample). Finally, the MMPI-2-RF-Tri scales added incrementally to standard MMPI-2-RF scale scores in predicting TriPM scores, supporting their utility in providing psychopathy trait information regarding test-takers above and beyond what could be derived from standard scale scores. These results indicate that the content coverage of the MMPI-2-RF item pool was sufficient to capture most central aspects of each triarchic construct; this has substantial implications for both psychopathy research and clinical assessment, given the widespread use of the MMPI-2/MMPI-2-RF, which will be discussed below.

Regarding findings for individual MMPI-2-RF-Tri scales, Boldness was associated with other psychopathy measures in mostly expected ways. It was substantially correlated with TriPM Boldness and PPI Boldness, and also with SRP-II Factor 1. These findings coincide with previous work indicating that boldness can be indexed using scales or items from psychopathy inventories not directly modeled after the PCL (Driscoll et al., 2014, 2015; Hall et al., 2014; Patrick, 2010b; Sellbom & Phillips, 2013; Stanley et al., 2013). Some readers might be surprised that SRP-II Factor 1 is more strongly associated with boldness than meanness; however, these findings are consistent with the fearlessness and low anxiety item content associated with this SRP-II factor, as well as research indicating its correlates suggest that it is better positioned within a nomological network representing boldness rather than meanness (e.g., Lilienfeld & Perna, 2001). In terms of broader implications, the ability to extract an effective item-based boldness scale from the MMPI-2-RF is important, given the centrality of the boldness construct in the psychopathy specifier for *DSM-5* Section III Antisocial Personality Disorder (American Psychiatric Association, 2013) and in view of evidence indicating that boldness differentiates primary psychopathy from antisocial personality disorder (Venables et al., 2014; Wall et al., 2015; see also Lilienfeld et al., 2012, for a review).

The MMPI-2-RF Meanness scale evinced a moderate-level association with the MMPI-2-RF Disinhibition scale in both development and validation samples, as is true of counterpart scales of the TriPM, and showed clear associations (at moderate to large levels) with its TriPM scale counterpart in both validation samples, the PPI/PPI-R Meanness scale (particularly in the university sample), the LSRP Primary scale in both validation samples, APSD Narcissism in the university sample, and the Mach-IV scale in the correctional sample. However, some lack of discrimination between the MMPI-2-RF Meanness and Disinhibition scales was evident in terms of their comparable, moderate associations with the ICU and PPI Meanness (but only in the female correctional sample). Moreover, some research has clearly indicated that the ICU is not a pure marker of callous-unemotional traits but reflects disinhibitory qualities as well (uncaring; see, e.g., Kimonis et al., 2008). In sum, given its primary associations with the TriPM Meanness, ASPD Narcissism, and Mach-IV scales, it is possible that the MMPI-2-RF Meanness scale indexes tendencies toward antagonism, exploitativeness, cynicism, disdain for others, and aggressive competitiveness, more so than lack of empathic capacity, but current findings need to be replicated in other samples before firm conclusions can be drawn.

The third of the MMPI-2-RF-Tri scales, Disinhibition, appears to function in a manner largely similar to its TriPM counterpart in terms of interrelations with other MMPI-2-RF-Tri scales and associations with relevant external criterion measures (i.e., facets of psychopathy inventories that reflect impulsive-externalizing tendencies). One potential caveat, noted just above, is that this scale correlated with the ICU (and PPI Meanness in the correctional sample) at levels comparable to MMPI-2-RF Meanness. However, this concern is mitigated by the impressive, selective contribution of MMPI-2-RF Disinhibition to prediction of TriPM Disinhibition (i.e., regression  $\beta$ s of .59/.62 for the two validation samples vs. .15/.19 for MMPI-2-RF Meanness; see Tables 2 and 3) and by the fact that the TriPM Disinhibition scale showed similar (if not larger) moderate-level associations with callousness criteria in the current validation samples (see Sellbom & Phillips, 2013). Taken together, these findings indicate that MMPI-2-RF Disinhibition provides an effective index of the disinhibitory facet of the triarchic model, considered to reflect general externalizing proneness (Patrick et al., 2009). However, it will be important to further evaluate the construct validity of this scale in other large samples using a wider range of criterion measures.

In terms of incremental validity, the results were generally variable in that the MMPI-2-RF-Tri Total and Boldness scores added quite substantial amounts of variance above and beyond standard MMPI-2-RF scales, whereas the amounts associated with Meanness and Disinhibition were more modest. However, all of these results were generally

in line (and substantially better for the Boldness scale) with previous research on the MMPI-2, which has set the standard for the amounts of incremental  $R^2$  change is meaningful for standard MMPI-2 scale scores, including the Content scales (Ben-Porath, Butcher, & Graham, 1991; Ben-Porath, McCully, & Almagor, 1993), the RC scales (e.g., Sellbom, Graham, & Schenk, 2006), and the PSY-5 scales (e.g., Wygant, Sellbom, Graham, & Schenk, 2006). It is nonetheless important to acknowledge that while incremental validity is necessary, it is not sufficient when considering adding new scales to the MMPI-2-RF (Butcher et al., 1995); the constructs being assessed also need to be of sufficient value. As indicated earlier, we argue that psychopathy is a very important clinical and forensic construct, with no standard scales presently available with sufficient content and discriminant validity to assess such traits on the MMPI-2-RF. Of course, future research will be required to further replicate and extend these findings prior to any formal implementation of clinical use.

The current findings have important implications for both the empirical study and clinical assessment of psychopathy. The MMPI-2-RF (which comprises a subset of the MMPI-2 item pool) is featured in a plethora of large databases across the world that can serve as vehicles for the study of psychopathy, and the availability of MMPI-2-RF-Tri scales will provide a myriad of opportunities for further investigation of psychopathy as conceptualized in triarchic terms—allowing scholars to elaborate on the constructs of the model in ways not previously possible. The availability of a large, population-representative normative data set for the MMPI-2-RF can serve as basis for computing norm-referenced scores, for use in characterizing individuals for either research or clinical-diagnostic purposes. Moreover, the MMPI-2/MMPI-2-RF instruments continue to be the most frequently used personality inventories in both clinical and forensic assessment settings (e.g., Archer et al., 2006), and they include validity scales that provide for evaluation of response bias. As such, the current work is likely to have direct clinical utility for assessing psychopathy in more variegated and conceptually meaningful terms. Given the existing widespread use of the MMPI-2/MMPI-2-RF, it should be feasible to rapidly evaluate the incremental validity of triarchic assessment of psychopathy for clinical prediction and decision making in forensic and correctional settings—and potentially other settings where the MMPI-2-RF is frequently used, such as preemployment evaluations for high-risk occupations.

The current study is also associated with some notable limitations, in light of which our general positive conclusions should be considered. One is that the correctional validation sample was limited to female participants. Intercorrelations among Triarchic constructs were somewhat smaller (especially Boldness and Meanness) compared to those observed in male correctional and mixed-gender university samples. Some studies have indicated higher mean levels of fearfulness among women

(see, e.g., Phillips et al., 2014), and other studies have explicitly observed that callousness is associated with reduced cortisol reactivity in boys but not in girls (e.g., Loney, Butler, Lima, Counts, & Eckel, 2006). This might suggest that fearless temperament does not account for the overlap between Meanness and Boldness in correctional women the same way as men (cf. Patrick et al., 2009), and perhaps accounts for some differences in the Meanness correlates observed here. This should be tested more directly in future research. It is noteworthy, on the other hand, that MMPI-2-RF estimates of PPI Fearless-Dominance and Impulsive-Antisociality are equally associated with external correlates across genders (Phillips et al., 2014). Nonetheless, it will be important to further evaluate the validity of the MMPI-2-RF Tri scales in male correctional samples. Another limitation is that both predictor (i.e., MMPI-2-RF-Tri scales) and criterion variables were assessed exclusively through self-report, raising the possibility of inflation of effect size magnitudes due to shared method variance. Thus, the estimated overlap between constructs might be exaggerated. However, it is unlikely that this would affect the *relative* degrees to which the Triarchic domains were associated with other psychopathy measures. Nevertheless, follow-up studies should include assessment of psychopathy and psychopathy-relevant traits in other domains of measurement, including interview- and informant-based ratings (e.g., PCL-R, APSD, interview-based *DSM* diagnoses).

Future validation studies should also include criterion variables from behavioral and physiological response domains that have been shown to relate to the triarchic model constructs when operationalized in other ways. As examples, MMPI-2-RF Disinhibition scores would be expected to correlate selectively (in a negative direction) with performance on cognitive task measures of executive function (Sellbom & Verona, 2007; Young et al., 2009) and reductions in brain response parameters including P300 wave (Patrick et al., 2006; Yancey, Venables, Hicks, & Patrick, 2013) and error-related negativity (Hall, Bernat, & Patrick, 2007; Patrick et al., 2013), whereas MMPI-2-RF Boldness would be expected to correlate selectively (also in a negative direction) with aversive startle potentiation (Benning et al., 2005; Dvorak-Bertsch, Curtin, Rubenstein, & Newman, 2009) and electrodermal activation during stressor anticipation (Dindo & Fowles, 2011). Indeed, a key objective in assessing psychopathy in terms of the triarchic model constructs is to facilitate mapping of the construct network of psychopathy (cf. Patrick et al., 2013) across differing domains of measurement (Patrick & Drislane, 2015). Finally, it will continue to behoove researchers to continue to document the degree to which these new MMPI-2-RF-Tri scales provide useful information above and beyond standard scales in the assessment of triarchic psychopathy in order to avoid a proliferation of new scales of dubious value (see Butcher et al., 1995).

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## Notes

1. The original triarchic model article (Patrick et al., 2009) noted that fearlessness has been discussed in the literature as relevant to callous-unemotionality or meanness (e.g., Frick & Marsee, 2006) as well as to boldness (e.g., Benning et al., 2005), and that this may represent a source of empirical overlap between the two. The identification of a “thrill-seeking” facet to boldness, and an excitement-seeking facet to meanness, come specifically from the literature on PPI fearless dominance (e.g., Benning et al., 2005; see also Kramer et al., 2012) and the externalizing spectrum model (Krueger, Markon, Patrick, Benning, & Kramer, 2007; Patrick et al., 2013), respectively. Further empirical research will be needed to clarify the role of dispositional fearlessness in these somewhat related but separable phenotype tendencies (Patrick & Drislane, 2015).
2. The narrative descriptions provided to raters can be found in the online supplement to Hall et al. (2014; [http://supp.apa.org/psycarticles/supplemental/a0035665/a0035665\\_supp.html](http://supp.apa.org/psycarticles/supplemental/a0035665/a0035665_supp.html)).
3. MMPI-2-RF® abbreviated items taken from the MMPI®-2 Booklet of Abbreviated Items. Copyright© 2005 by the Regents of the University of Minnesota. All rights reserved. Used by permission of the University of Minnesota Press. “MMPI” and “Minnesota Multiphasic Personality Inventory” are registered trademarks owned by the Regents of the University of Minnesota.
4. The psychometric properties of the scales were also evaluated separately for male ( $n = 34,936$ ) and female ( $n = 7,354$ ) prisoners in the large correctional sample to evaluate the effectiveness of the scales in both genders. Correlations were highly similar across the two samples. The intercorrelations for MMPI-2-RF Boldness and Meanness were .11 for females and .09 for males; for Boldness and Disinhibition,  $r_s$  were  $-.05$  for females and  $-.09$  for males; and for Meanness and Disinhibition,  $r_s$  were .45 for females and .46 for males. Likewise, internal consistencies of the scales were similar across the two genders. Cronbach’s alphas were .76 (female) and .73 (male) for Boldness, .78 and .79 for Meanness, and .68 and .71 for Disinhibition.

5. An alternative three-factor model has been proposed and validated (e.g., Salekin et al., 2014; Sellbom, 2011), but the Egocentricity and Callous scales that make up the original Primary scale are both specifically associated with Meanness (e.g., Sellbom & Phillips, 2013), and using the Primary and Secondary scales here make our results more directly comparable to those of Drislane et al. (2015) and Hall et al. (2014).
6. We calculated intraclass correlation (ICC) statistics to determine the degree of agreement between MMPI-2-RF-Tri scales here and the correlations reported for the TriPM scales in Sellbom and Phillips (2013). We added the PPI-Tri scales and TriPM correlations, which were not reported in Sellbom and Phillips, to the mix specifically for these ICC calculations. Overall, the ICC values were good to excellent; for Boldness, the ICCs were .99 (correctional sample) and .98 (university sample); for Meanness, .92 (correctional) and .80 (university); for Disinhibition, .90 (correctional) and .96 (university). Thus, the MMPI-2-RF and TriPM scales do exhibit similar patterns of correlations with external criteria.

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