Triarchic or Septarchic? - Uncovering the Triarchic Psychopathy Measure's (TriPM) Structure

Sandeep Roy
University of North Texas

Colin Vize
Purdue University

Kasia Uzieblo
Ghent University, Ghent
De Forensische Zorgspecialisten, Utrecht

Josanne D. M. van Dongen
Erasmus University, Rotterdam

Joshua Miller
University of Georgia

Donald Lynam
Purdue University

Inti Brazil
Radboud University, Nijmegen

Dahlnym Yoon
FernUniversität in Hagen

Andreas Mokros
FernUniversität in Hagen

Nicola Gray
Swanses University

Robert Snowden
Cardiff University

Craig S. Neumann
University of North Texas

Author Note.
Sandeep Roy and Colin Vize are joint first authors. Correspondence: Sandeep Roy and Craig Neumann, Psychology, University of North Texas, Denton, TX. 76203., or Colin Vize, Purdue University, 703 3rd Street, West Lafayette, IN Email: SandeepRoy@my.unt.edu; craig.neumann@unt.edu; cvize@purdue.edu;

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Abstract

The Triarchic Psychopathy Measure (TriPM) is based on a three-dimensional conceptual model, though few studies have directly tested if it can be supported by a three-factor structure. The current study used a large community sample (N=1,064, 53% males, mean age = 34) to test the structure of the TriPM via exploratory and confirmatory factor analysis, along with four community replication samples from North American and Europe (N's = 511-603, 33-49% males) and one European male offender sample (N = 150). Three of these samples were also used to model the correlations between relevant external correlates and the original TriPM factors versus emergent factors to examine the cost of mis-specifying TriPM structure. The model analyses did not support a three-factor model (CFI = .76, RMSEA = .08), revealing a number of items with limited statistical information, but uncovered a seven-factor structure (CFI=.92, RMSEA=.04). From the majority of Boldness, Meanness, and Disinhibition scale items, respectively, emerged three factors reflecting: Positive Self-image, Leadership, and Stress Immunity; two factors tapping Callousness and Enjoy Hurting; and two factors involving trait Impulsivity and overt Antisociality. Further, the Enjoy Hurting and overt Antisociality factors were more strongly correlated with one another than with the other scales from their home domains (Callousness and Impulsivity). All seven emergent factors were differentially associated with the external correlates, suggesting that the three original TriPM factors do not optimally represent the conceptual model underlying the TriPM.

Introduction

Psychopathy is a prominent focus of personality disorder research, with continuing debates on which traits are essential to the construct. Thus, there are different conceptual and empirical models of psychopathy and measures designed to operationalize the models (Hare & Neumann, 2008; Lynam et al., 2013; Patrick, Fowles, & Krueger, 2009). One recent model and measure is Patrick and colleagues' Triarchic Model along with the Triarchic Psychopathy Measure (TriPM; Patrick et al., 2009; Patrick, 2010; Patrick & Drislane, 2015). In the triarchic conceptualization, psychopathy is represented by three domains: Boldness, Meanness, and Disinhibition (Patrick & Drislane, 2015; see Sleep, Weiss, Lynam, & Miller, 2019 for a meta-analytic review). Disinhibition reflects a wide diversity of impulse control difficulties such as lack of planning and foresight, impaired regulation of affect and urges, insistence on immediate gratification, and difficulties with behavioral restraint (Patrick et al., 2009; Patrick & Drislane, 2015). Meanness is proposed to index deficient empathy and lack of close attachments, as well as disdain for and exploitation of others (Patrick et al., 2009), highlighting different types of 'meanness' (i.e., poor empathy vs. exploitation). Boldness is thought to reflect traits involving confidence, social assertiveness, fearlessness, emotional resiliency, and adventuresomeness (Patrick & Drislane, 2015). Given this wide array of item content, it is not surprising that new research raises questions about the TriPM's structural integrity (e.g., Shou et al., 2017; Somma et al., 2018), and thus the viability of the TriPM conceptual model.

The TriPM was created by selecting items from two measures, the Boldness Inventory (BI; Patrick et al., 2019), which was unpublished at that time, and the Externalizing Spectrum Inventory (ESI: Krueger, Markon, Patrick, Benning, & Kramer, 2007). Both the ESI and the BI were developed using parallel analytic approaches (e.g., multiple assessment waves, item-response theory methods, confirmatory modeling). The 19-items of the TriPM-Boldness scale were taken from the 130-item BI, which was developed to fully capture the boldness construct and its boundaries, while also examining how a broader boldness construct related to other operationalizations of boldness, such as the Fearless-Dominance (FD) factor within the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld & Widows, 2005). Patrick and colleagues (2019) found a bifactor model best fit the BI with the nine subscales (e.g., Social Assurance, Dominance, Persuasiveness, Self-confidence, Optimism, Resilience, Valor, Intrepidness, and Tolerance for Uncertainty) loading onto a general Boldness factor with the latter six subscales listed above also having residual loadings on two subfactors indexing Emotional Stability and Venturesomeness. The general factor and subfactors evidenced small to small-moderate correlations with the facets of the PCL-R in an offender sample (*r*s = -.04-.30) and expectedly robust links with PPI-R FD scales (*r*s = .51-.84) in a student sample (Patrick et al., 2019). The 19 items selected for the TriPM-Boldness scale were drawn from each of the 9 facets of the BI, with three items being drawn from the Persuasiveness facet and two items from the remaining eight facet scales. The TriPM-Boldness scale was strongly related to the total BI scale ($r = .95$; Patrick et al., 2019) and the FD factor of the PPI-R ($r = .82$; Patrick et al., 2019).

The 20-item Disinhibition and 19-item Meanness TriPM scales were created by selecting items from subscales of the 415-item ESI, which was designed to assess the traits and behaviors (e.g., substance use, aggression) that fell under the externalizing domain as identified in hierarchical models of psychopathology. The seven subscales of the ESI that provided items for the TriPM-Disinhibition scale were those that had their strongest loading on the general disinhibition factor of the ESI's bifactor model. The TriPM-Meanness scale was created using items from the six ESI subscales that had notable loadings on both the general disinhibition factor as well as the ESI callous-aggression subfactor. Of the 19 TriPM-Meanness items, 14 of these items were selected from the two ESI subscales (Relational Aggression and Empathy) that had their largest loadings on the callous-aggression subfactor. Patrick (2010) reported Meanness and Disinhibition were moderately correlated ($r = .45$; Drislane, Patrick, & Arsal, 2014; see also Patrick et al., 2013), though other studies find large correlations between TriPM Meanness and Disinhibition (e.g., *r*s = .79 and .64; Patton, Smith, & Lilienfeld, 2019; Crego & Widiger, 2014). Meta-analytic findings affirm these scales are strongly inter-related (meta $r = .53$; Sleep et al., 2019). The TriPM Meanness and Disinhibition scales are more modestly correlated with Boldness (*r*s of .23 and -.10, respectively; Drislane, Patrick, & Arsal, 2014).

The informative value of items in models of psychopathy

Item-level analyses of psychological inventories are essential considering that individuals are responding to items that are empirically tied to theoretical latent constructs (Reise, 1999). For psychopathy scales, item-level latent variable models provide quantitative information on how well items discriminate individuals with different degrees of psychopathic propensity, and which items that are essential for statistical representations of the conceptual domains they are designed to tap (Hare & Neumann, 2008). A four-factor Psychopathy Checklist-based model (PCL-R; Hare, 2003; Hare, Neumann, & Mokros, 2018) is strongly supported across different item sets, assessment approaches, and sample types (Neumann, Hare & Pardini, 2015). A Five-Factor Model (FFM) conceptualization of psychopathy (Collison, Miller, Gaughan, Widiger, & Lynam, 2016) and the Youth Psychopathic Inventory (YPI; Neumann & Pardini, 2014) have also received support via item-level latent variable modeling. Relatedly, item-level models are helping to uncover the structure of callous-unemotional traits (CU; Hawes et al., 2014), and develop the Proposed Specifier for Conduct Disorder (PSCD; López-Romero et al., 2019).

Conversely, studies raise questions regarding the TriPM items (Shou et al., 2017), and the PPI on which the TriPM is based in part (Neumann et al., 2013b). Moreover, with respect to BI development (Patrick et al., 2019), from which TriPM Boldness items were selected, item-level latent variable analyses were never conducted to assess the purported unidimensionality of the Boldness facets. Confirmatory factor analytic (CFA) approaches have raised concerns regarding the unidimensionality and clinical utility of the PPI FD factor, closely aligned with Boldness, and the recent DSM-5 psychopathy specifier based FD/Bold traits (Miller, Lamkin, Maples-Keller, Sleep, & Lynam, 2018; Neumann et al., 2013b). Items also provide information about endorsement levels. Based on mean item scores, community studies, unsurprisingly, find endorsement levels at the low end of the psychopathy spectrum (Colins, Fanti, Salekin, & Andershed, 2017; van Dongen, Drislane, Nijman, Soe-Agnie, & van Marle 2017; Neumann & Hare, 2008; Patton et al., 2018). However, low endorsement levels are also found in TriPM studies with forensic (van Dongen et al., 2017) and offender samples (Stanley, Wygant, & Sellbom, 2014). Such results could be due to the fact that some items provide little item discrimination information, and thus add limited value to the overall scale. One of the benefits of item-level modeling is that shorter tests can perform better than traditional assessments with longer item sets, which is due to the amount of parametric information provided by the items (Embretson, 1996). Thus, dropping poorer preforming items can enhance self-reports' structural properties (e.g., item discrimination).

TriPM item-level latent structure

Three studies have investigated the item-level properties of the TriPM and consistent problems emerge (Latzman et al., 2018; Shou et al., 2017; Somma et al., 2018). In a Chinese translation of the TriPM, the Boldness scale did not appear to be unidimensional, and the

Meanness and Disinhibition scales contained items that provided limited information (Shou et al., 2017). Latzman and colleagues (2018) found evidence of TriPM item cross-loadings and correlated residual error terms were required to fit an item-level three-factor model, suggesting that additional underlying factors are present within the item set. Latzman et al. (2019) reported that the use of correlated residuals was needed to account for “item co-dependencies” (p. 7) and wrote TriPM items “may not be optimal… for modeling the triarchic model dimensions.” (p. 19).

Somma et al. (2018) sought to identify additional factors that exist within the TriPM item set, some of which involve reversed keyed items. In their dimensionality analyses of each separate TriPM domain, no scale evidenced unidimensionality; multiple dimensions were evident in all three TriPM scales. These authors also tested single scale bifactor models, but did not examine a bifactor model across the entire TriPM item set. Like Latzman et al. (2018), Somma et al. also employed correlated residual errors within a correlated three-factor model in order to achieve adequate fit. If, as reported, they allowed error correlations between items loading .20 or greater on the same factor, to account for distinct subfactor loadings, then the final model included 121 such error correlations; if the decision was based on loadings of |.20| or greater then 174 such error correlations were estimated. Using model modifications (correlated errors) to achieve ‘good’ fit is generally problematic (Gerbing & Anderson, 1984; Chou & Huh, 2012), particularly when this many are allowed. Moreover, correlated errors ‘hide’ sources of meaningful covariance whose effects on other constructs are unknown. Finally, Somma et al. (2018) did not consider limitations of the bifactor model (Bonifay, Lane, & Reise, 2017; Reise, Kim, Mansolf, & Widaman, 2016), or test alternative multidimensional models.

Item-level modeling has advanced psychopathy research (Hare, Neumann, & Mokros, 2018). A soundly articulated latent structure provides evidence of internal construct validity and understanding of the dimensions that underlie a given measure (Strauss & Smith, 2009). As noted by Smith and colleagues (2009), “To the degree that one uses a single score from a target measure that includes multiple dimensions … one’s construct validation/theory test has theoretical uncertainty built in. Such a test is likely to have reduced scientific value.” (p. 273). In other words, when multidimensional scales are treated as unidimensional, there is limited value in embedding them within a nomological network, given that the veracity of the associations with external correlates will be ambiguous.

The current study tested the structure of the TriPM via item-level exploratory and confirmatory factor analyses (EFA, CFA) in multiple, large, online, community and offender samples from North America and Europe. We expected the item-level three-factor model would evidence poor fit based on previous research (Latzman et al., 2018; Shou et al., 2017; Somma et al., 2018). Following the methodology of Somma et al. (2018), we initially examined the items within each TriPM scale separately and expected multiple dimensions (factors) would emerge from each of the three TriPM domains. In this way, we sought to replicate the Somma et al. findings of TriPM scale multidimensionality, but also uncover the nature of these dimensions. The individual scale analyses were followed-up with simultaneous analyses of all 58-items. Consistent with model-based theory (Reise, 1999), we expected that the items within the new emergent factors would evidence stronger discrimination parameters (i.e., factor loadings), and this would help separate offender from non-offender participates. Also, given the diversity of TriPM item content, we expected that the new factors would evidence differential associations with external correlates. While our initial approach involved analysis of each separate TriPM scale, our overall goal was to identify and test omnibus multidimensional models that entailed all TriPM items with meaningful information, and thus CFA provided an optimal approach.

Method

Sample Descriptions. Six large U.S. or European samples were used for the study.

Sample 1. Sample 1 was made up of participants from Amazon's Mechanical Turk platform (MTurk) (N = 1064; 53% males). The mean age of the sample was 34.12 (*SD* = 10.49). Participants were White (77%), African-American (7.4%), Hispanic (5%), Asian (6.2%) or other (4.6%) with a 4-year college degree (38%), some college (30%), 2-year college degree (10%), high school degree (9.3%) or graduate education (12.7%). To insure data quality, validity check questions were embedded in the questionnaires. Participants' data were only included if all four validity questions were answered correctly which pertained to the majority of cases (98%).

Sample 2. An MTurk sample (N = 603; 37% males) with mean age 37.04 (*SD* = 11.74). Race/ethnicity were reported non-exclusively as White (83%), African-American (9.8%), Asian (7.8%), Native-American (3.5%), or other 0.8%. The majority had some form of college (53.3%) or high school (36.8%) education or below (10%).

Sample 3. An MTurk sample (N = 591; 38% males) with mean age 36.95 (SD = 11.74) and either a college (37.2%), high school (36.9%), or advanced (13.7%) education, and some below high school education (10.2%).

Sample 4. A community sample (N = 511; 33% males) with mean age of 28.54 (SD = 13.03) and was predominantly Belgian (97%) with a small percent a different nationality (3%). The majority of participants had a high school education (70%), followed by those with a bachelor (21%), masters (6.5%) or more advanced/other degree (2.5%).

Sample 5. This community sample (N = 495; 49% males) was described in van Dongen et al., (2017). Mean age was 27.70 (SD = 13.09). Participants were primarily European (95.2%) or from Central/South America (2%), Middle East/Africa (1.7%), or Asia (1.1%).

Sample 6. This European offender sample (N = 150; 100% males) is part of an on-going larger study described initially in research by Gray and colleagues (2019). The male offenders, approximate mean age of 45, were primarily White (76%) or Black (5%) British citizens versus mixed or other race/ethnicities (19%). In terms of education, 40% had achieved General Certificate of Education (GCE) Ordinary Level, 7.1% achieved A-levels, 1.4% formal degree, 8.6% some other form of certificate through prison, and 42% had no formal certificate. The majority of the sample (80%) was either single or separated/divorced. Based on index offenses, the sample evidenced a range of criminal offenses including, murder, attempted murder, rape, wounding, grievous bodily harm, robbery, and other offenses.

External Correlates. Samples 1-3 also contained a number of well-validated external correlates that have been used in previous research. Positive and negative affect were assessed with the PANAS (Watson et al., 1988). The Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) assessed alcohol use. The Trauma History Questionnaire (THQ; Green, 1996) assessed trauma experiences. General personality was assessed via the IPIP-NEO 120 (Maples et al., 2014). Antisociality was assessed via the Crime and Analogous Behavior scale (CAB; Miller & Lynam, 2003) or the SRP-SF antisocial facet (Paulhus, Neumann, Hare, 2017).

Data Analytic Plan. Latent variable modeling (EFA/CFA) was carried out via Mplus (Muthén & Muthén, 2013), using robust weighted least squares estimation (WLSMV) given the ordinal TriPM items. First, in sample 1, a three-factor TriPM model with all 58 items was tested via CFA. Items were specified to load directly onto their respective factor, and the factors were allowed to freely correlate. Sample 1 was also used to run separate CFAs for each TriPM domain (Boldness, Meanness, Disinhibition) to test if they were indeed unidimensional. Anticipating poor fit for the three-factor model, and the single factor CFAs, sample 1 was used to follow-up with separate item-based EFAs for each TriPM domain with geomin (oblique) rotation, a preferred and the standard Mplus approach for arriving at clean factor structure solutions (Schmitt & Sass, 2011). The goal of the three EFAs was to identify items that evidenced substantial parametric information versus those with little information, similar to what Patrick et al. (2013) did in their ESI research. Since factor loadings are comparable to IRT alpha (discrimination) parameters (Reise, 1999), we identified items with large factor loadings and dropped items with subpar loadings (i.e., only 16% or less of item variance accounted for), and/or substantial cross-loadings onto other factors which significantly hamper interpretation of factors (Reise et al., 2010). The EFAs were evaluated via standard model fit indices provided by Mplus. The viability of the EFA results were checked via CFAs for each TriPM domain, using sample 1, and without the poor performing items, specifying a model that corresponded to the best EFA solution. We also employed exploratory structural equation modeling (ESEM), a hybrid of EFA and CFA, to test whether the best fitting ESEM solution using all 58-items corresponded with the aggregate total of factors extracted from the separate EFAs.

Next, an omnibus item-level CFA was specified with all identified emergent factors extracted from EFAs. The empirically derived omnibus model was then tested with the replication samples (#'s 2-6). For our penultimate CFAs, separate models were specified to examine how Patrick's (2010) original three TriPM factors versus the new factors derived from our EFA/CFA analyses were associated with the external correlates (samples 1-3). In this way, we examined the advantages of modeling the multidimensionality within the original TriPM domains. Differences between latent correlations were tested via Steiger's method (1980).

Finally, supplementary CFAs were tested to gauge the viability of potential alternative TriPM models. Somma et al. (2018) only examined separate bifactor models for each TriPM scale, and so we examined a full 58-item bifactor model. All items we set to load on a general factor and items also loaded onto their respective TriPM specific (or group) subfactor, with the general and specific factors set to be orthogonal. In addition, we used a formal modeling approach to address potentially unique TriPM item covariances. Somma et al. (2018) used correlated residual errors to accommodate "commonalities in substantive content and in *keying* and wording of items" (p. 23). Following the approach of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) we controlled for the potential effect of the 17 reverse-coded TriPM items through a latent method factor. This factor represented common method variance and was orthogonal to the three common TriPM trait factors. [1]

To assess model fit a two-index strategy was adopted (Hu & Bentler, 1999), using the incremental Comparative Fit Index (CFI) and the absolute Root Mean Square Error of Approximation (RMSEA) index. We relied on the traditional CFI $\geq$ .90 and RMSEA $\leq$ .08 as indicative of acceptable model fit to avoid falsely rejecting viable latent variable models, since model complexity increases the difficulty of achieving conventional fit (West, Taylor, & Wu, 2012). In terms of comparing models, we did not rely on the traditional approach of using differences in X^2 since large N's can produce significant X^2 values even when the discrepancies between two models are trivial (West et al., 2012). West et al. suggest using guidelines laid out by Cheung and Rensvold (2002) to assess statistical differences in model fit. If the incremental change in the comparative fit index (ΔCFI) between one model and a nested, more-constrained, model is $\leq$.01, then the two models do not differ in statistical fit. Lastly, Hedge's g was used to assess how offenders differed from non-offenders (aggregated sample) with respect to models.

[1] Note that we also re-tested the originally proposed three-factor model without the poor performing items. Results continued to show poor fit for this model. See Table 1, Reduced item set supplementary (CFA), 3-factor Omnibus.

Results

Descriptive statistics are displayed in Supplementary Table S1. The TriPM scale scores are presented in mean item scale format to show average trait endorsement. Consistent with other community studies, endorsement levels were at the low end of the psychopathic spectrum. Since coefficient alpha is not an indicator of scale unidimensionality (Schmitt 1996), we relied on mean inter-item correlations (MICs). Clark and Watson (1995) recommend MICs fall within .15-.50. The Boldness and Disinhibition scales manifested relatively low scale homogeneity, particularly for the three European samples.

Original item set: TriPM three- and single-factor CFA results. Modeling results are displayed in Table 1. As predicted, using the full 58 items and proposed item-to-factor specifications, model fit for the three-factor TriPM did not reach acceptable fit for both indices (see Table 1, 3-factor Omnibus). The same results were found with the replication samples (CFI's = .72-.75; RMSEA's = .06-.07). Similar to Somma et al. (2018), there were a number of items with poor factor loadings (e.g., Boldness items 4, 47; Meanness, 2, 17; Disinhibition, 3, 27). See also mean item loading range in Table 1. The overall mean factor loading indicated that less than half of the item variance was accounted for by the latent factors (i.e., $.65^2 = 42\%$), indicating that the items provide low-moderate psychometric information. As displayed in Table 1, the single factor CFAs for the Boldness and Meanness factors also demonstrated poor fit. The Disinhibition factor did show acceptable model fit, however, the mean item loading indicated this factor was not able to account for the majority of item variance (i.e., 42%).

Initial EFA and revised TriPM CFA results. As shown in Table 1, using Sample 1, we found three factors could be extracted from the Boldness items, with the solution providing acceptable fit and factors reflecting Leadership, Stress Immunity, and Positive Self-image. The initial EFAs revealed that two factors each were evident in the Meanness and Disinhibition item sets, with each solution showing excellent fit. The Meanness factors reflected Callousness and Enjoy Hurting. The two factors extracted from the Disinhibition item set reflected Impulsivity and overt Antisociality.[2] The EFA results revealed a number of items meeting criteria for being dropped (#'s Boldness: 4, 7, 22, 25, 47; Meanness: 8, 17, 20, 39, 48, 55; Disinhibition: 9, 18, 27, 30, 37, 51, 56). These items provide little statistical information and limit the structural integrity of the TriPM item set; many were similar to those reported in Somma et al. (2018, see Table 3). As a check on the seven factor solution, an ESEM was conducted with all 58 items, which indicated a 7-factor solution produced the best fit (CFI = .97, RMSEA = .03), better than a 6-factor solution (ΔCFI = .02), and no difference from an 8-factor solution (ΔCFI = .00). Supplementary Table S2 displays the ESEM item-to-factor results which were generally in-line with the single factor EFAs, and also highlight the problematic nature of many items.

Finally, follow-up CFAs of the initial EFA results were conducted without the problematic items. These CFAs showed good fit (see Reduced item set results Table 1). The mean factor loadings indicated that the items had strong discrimination information and the new factors accounted for approximately 50% or more of item variance. Figures 1-3 display item content and standardized CFA parameters for the new seven factors.

Omnibus CFA, replication results, & group comparisons. The omnibus CFA, seven new factors in one model, sans the poor performing items, resulted in good fit for sample 1, and generally acceptable fit for the five replication samples (see Table 1, Revised item set results).[3]

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[2] The ΔCFI's (.05-.09) provided evidence for our choice of EFA solutions. For Boldness items, EFA fit for 1- and 2-factor solutions, and each 1-factor EFA solution for Meanness and Disinhibition items, were poor (CFI's = .81-.88; RMSEA's = .13-.11). Extraction of additional factors for all scales increased item cross-loadings.

[3] To allow direct comparison between the original three-factor TriPM model and the seven-factor model, we re-tested the former without the poorer performing items, since these items were omitted from the seven-factor model. As shown in Table 1, the seven-factor model outperformed the reduced item set three-factor model (i.e., ΔCFI =

Across samples, strong mean item loadings indicated this model structure resulted in items with good discrimination by degree of psychopathic propensity. As expected, scale composites that represented the seven factors versus the original three TriPM factors provided greater separation of offenders from non-offenders (See Figure 4). Hedge's g for the three-factor composites (Boldness, Meanness, Disinhibition, respectively) were, .17, .58, 1.45, and the seven factor composites (Leader, Stress-immune, Positive self-image; Callous, Enjoy hurting; Impulsivity, Antisociality, respectively) were, .01, .01, .86; .31, .79; .43, 1.90. The results show offenders are mostly strongly separated from non-offenders in terms of several of the seven-factor composites: (poor) self-image, enjoyment in hurting others, and overt antisociality.

The latent correlations among the seven TriPM factors are displayed in Table 2. Except for a few differences, there was remarkable uniformity in the pattern of correlations across samples. Notably, the three factors extracted from the Boldness items (Leadership, Stress Immunity, Positive Self-image) displayed a heterogeneous pattern of differential associations with the two factors extracted from the Meanness items (Callous, Enjoy Hurting), and similarly with the two factors extracted from the Disinhibition items (Impulsivity, Antisocial). However, the three European samples had stronger correlations between the Leader and Enjoy Hurting factors, compared to the U.S. samples, and also had positive associations between the Leader and Impulsivity factors, suggest potential cultural differences with respect to the Leader factor.

External correlate CFAs. Using samples 1-3, CFAs were specified to examine the correlations between the external correlates and the respective TriPM original three- and new seven-factors. Tables 3-5 present these correlation results.[4] Comparisons of how the new seven

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.14). Similar results were found with the single TriPM scales, dropping the poor performing items, compared to multi-dimensional scales (ΔCFI's = .04-.12).

[4] Note the same substantive pattern of correlations were found when the three-factor model without the poor items was examined with the external correlates

factors were associated with the external correlates revealed that the majority were statistically different. Interpretation of these results our provided in the Discussion, though we note here the significant number of heterogenous correlations between the new seven factors and all of the external correlates, raising concerns about the structural validity of the original TriPM scales.

Supplementary CFAs. When testing a 58-item bifactor model, it achieved acceptable fit, but a problem with this model, among others (see below), is that it results in poor item discrimination parameters (see low mean loadings in Table 1), with some items loading negatively on the general factor. We re-tested the bifactor model, after dropping the poor performing items, and as before the model fit adequately but not as well as the seven-factor model (ΔCFI = .02). Also, the model with a method factor to address reverse keyed items resulted in poor model fit (CFI = .77; RMSEA = .08), indicating that problems with the original three-factor model is not due to unique item covariances involving item keying, as suggested by Somma et al. (2018). Lastly, we tested if the new seven factors might serve as indicators for higher-order Boldness, Meanness, and Disinhibited factors. This model resulted in poorer model fit (CFI = .84; RMSEA = .07), indicating that the seven correlated (first-order) factors model is the better model (ΔCFI = .08) and that these seven factors do not serve as respective indicators for three higher-order TriPM factors.

Discussion

The triarchic perspective and the TriPM have become increasing popular in recent years (see Sleep et al., 2019 for a review), although some concerns have been raised (Gatner, Douglas, & Hart, 2016; Shou et al. 2017; Sörman et al., 2016). Also, traits tied to the triarchic perspective have been added as features of a psychopathy specifier in the DSM-5, though not without critique (Miller et al., 2018). Surprisingly, research on the structure of the TriPM has been relatively absent, though previous research has raised questions regarding TriPM scale validity (Shou et al., 2017; Sleep et al., 2019). The current results raise significant concerns that the TriPM may not accord sufficiently with the triarchic conceptual model of psychopathy.

There is now a “prominent focus on analyses of internal structure of measures in the psychopathy literature” (Somma et al., 2018, p. 3). Structural equation modeling identifies items with strong discrimination parameters (loadings), similar to IRT (Reise, 1999), but also can provide multidimensional statistical representations of the conceptual psychopathy models that assessments are designed to tap (Collison et al., 2016; Hare & Neumann, 2008), potentially offering models that generalize across community and offender samples (Neumann et al., 2015; Neumann & Pardini, 2014). Our current modeling results reveal that the triarchic domains cannot be represented via an item-level three-factor model, given each TriPM scale is clearly multidimensional, consistent with other research (Shou et al., 2017; Somma et al., 2018).

Conceptual models ultimately must have some form of measurement to conduct scientific research, and it is not unreasonable to ask that such measures demonstrate internal construct validity (e.g., latent structural models) in-line with their larger conceptual model (Strauss & Smith, 2009). If it is possible to represent proposed concepts within a statistically rigorous modeling framework, then it is provides far more support for the scientific endeavor. Take for example latent variable modeling research uncovering the larger conceptual model of psychopathology (Kotov et al., 2017). The TriPM conceptual model has considerable appeal among some investigators, perhaps in part due to its parsimony, but there are 58 items used to measure this simplified conceptual model. We believe it is critical to conduct item-level analyses to test whether there is any support at the structural level for the ideas offered at the conceptual level. The history of the FFM is a good example regarding the use of analytic strategies (factor analysis) to empirically articulate the lexical Big Five (Dingman, 1997; John et al., 1988). In similar fashion, Hare (2003) provided the leading-edge effort to articulate much of Cleckley's conceptual model of psychopathy via the PCL-R family of instruments which are supported by a rigorous generalizable statistical model (Hare & Neumann, 2008; Neumann et al., 2015).

Although there was not support for a triarchic model, there was consistent support for a seven-factor model across six different samples. The current results showed the seven-factor model has strong item parameters, and thus offers an empirical basis to accurately differentiate individuals with varying degrees of psychopathic propensity. The seven factors are significantly correlated, though not at a level suggestive of factor redundancy.[5] Relatedly, we showed that composites representing the seven factors discriminated offenders from non-offenders in terms of (low) Positive self-image, while the original Boldness scale missed this. Similarly, offenders differed far more from the non-offenders in terms of Enjoy Hurting others rather than the original Meanness scale. Also, offenders were notably more Antisocial than non-offenders, and the two groups differed less in Impulsivity, which the Disinhibition scale misrepresented.

The current results also provide evidence of significant differential associations across the seven factors and an array of relevant external correlates, raising further questions about the original TriPM domains (Tables 3-5). We anticipated finding such evidence, given the diversity of TriPM item content and the exposition by Smith et al. (2009) on the problems of multidimensional single scale scores. Among the three factors that emerged from the TriPM Boldness scale (Leader, Stress Immune, Positive Self), 84% of the correlations with the external correlates were statistically different, and similarly 92% and 96%, respectively, differed among

[5] Although we found support for a 7-factor model, there may be other viable solutions for the TriPM as well. In other research, Collison, Miller, and Lynam (2019), despite using a different methodological approach and model estimation procedure than the current study, found that 5-7 factors could be extracted from the TriPM and TriPM-alternative scales.

the factors that emerged from the Meanness (Callous, Enjoy Hurting) and Disinhibition (Impulsivity, Antisociality) scales. These results suggest that the three original TriPM scales are misrepresenting important sources of covariation, and therefore, the triarchic model is mis-specified (i.e., does not accurately account for the structure of TriPM item covariance).

The modeling results and the differential correlations uncovered have substantive relevance for understanding of the nature of psychopathy. In particular, the three new factors derived from the Boldness item set evidenced divergent correlations with the other four new factors. Given this pattern of associations, along with heterogeneous associations with the external correlates, it appears that the original Boldness factor is not sufficiently structurally coherent, in-line with previous modeling of FD (Neumann et al., 2013b). The three factors that emerged from the Boldness items displayed divergent associations with external correlates, whereas the TriPM Boldness scale was essentially uncorrelated with a variety of constructs traditionally associated with psychopathic personality (e.g., substance use, antisocial behaviors). More generally, the most heterogeneous set of associations occurred with the Leader, Stress Immune, and Positive Self factors. These three 'bold' factors displayed a diversity of positive and negative correlations, as well as correlations differing significantly in strength, with the external correlates, indicating that the original TriPM Boldness scale may have limited theoretical and clinical utility (Smith et al., 2009). These results are consistent with findings demonstrating divergent relationships between the scales of the DSM-5 psychopathy specifier (i.e., FD/Bold) with external correlates (Miller et al., 2018).

The factors that emerged from the Boldness items were associated with high extraversion and positive affect and low neuroticism, a pattern associated with positive adjustment (Marcus et al., 2013; Miller & Lynam, 2012). In contrast, the Callous, Enjoy Hurting, Impulsivity, and

Antisocial factors were all uniformly associated with low levels of agreeableness and conscientiousness, increased substance use, diverse antisocial behaviors, and high negative affect, in-line with results of other structural psychopathy models (Marcus et al., 2013; Miller & Lynam, 2012; Neumann & Hare, 2008).

The Enjoy Hurting and Callous factors showed notable differences in their associations with most external correlates, particularly with antisocial behavior. Such divergent associations may provide a lead in furthering research on the affective/interpersonal disturbances in psychopathy. In particular, the Enjoy Hurting factor may be interpreted with respect to previous (Neumann et al., 2007) and recent (Viding & McCrory, 2019) research highlighting atypical affiliation in psychopathy. Also, the Enjoy Hurting and overt Antisociality factors were more strongly correlated with one another than with their other factor from the same domain. For example, in Sample 1, Enjoy Hurting and Antisociality correlated more highly (r = .80) than did Enjoy Hurting with Callousness (r =.57) and Antisociality with Impulsivity (r = .67). The association between the Enjoy Hurting and Antisocial factors accords well with studies that find both affective and antisocial psychopathy factors are strong predictors of violence (Krstic et al., 2017), and that these psychopathic domains both load onto a common genetic factor (Viding, Frick, & Plomin, 2007). The Enjoy Hurting-Antisocial association is also consistent with research suggesting psychopathic propensities are linked with enjoyment of negative social interactions (Foulkes et al., 2014a, 2014b), as well as contemptuousness (Garofalo et al., 2018).

The links between the original TriPM Disinhibition scale and the external correlates reflecting various antisocial behaviors can be better understood in the context of the scale being composed of items that form distinct Impulsivity and Antisociality factors. Unsurprisingly, the latter factor was more robustly associated with a variety of antisocial tendencies compared to the

Impulsivity factor. As such, use of the TriPM Disinhibition scale can create ambiguity regarding the link between 'disinhibition' and antisocial behavior.

Consistent with other TriPM item-level modeling research (Shou et al., 2017), we identified a number of items with poor model parameters, though we did not find as many problematic items as reported in Latzman et al. (2018) or Somma et al., (2018). The presence of poor performing items is not specific to the TriPM given such items are often found when item-level modeling is carried out (Walton, Roberts, Krueger, Blonigen, & Hicks, 2008; Ray et al., 2016). Certainly, it is important to identify good fitting models, without use of correlated errors, or poor performing items, to precisely identify individuals with psychopathic propensities.

Although our initial model analyses did involve working from within a three-factor framework to uncover evidence of multidimensional TriPM scales, it is critical to highlight that the seven new factors are *not* lower-order indictors for three higher-order TriPM domains, given that a hierarchical model did not fit the data adequately, along with pervasive differential correlations among the seven first-order factors with the external correlates. Moreover, when moving out of the three-factor framework and allowing items to load across factors (i.e., ESEM), the results were in-line with the seven-factor CFA results. The results also indicated a bifactor model could not account for the TriPM items as well as a seven-factor model. The bifactor model is easy to fit, since it requires many estimated parameters, but nevertheless, there are problem with it, such as suboptimal discrimination parameters, modeling embedded implausible response patterns (Reise et al., 2016), doubts about accurate representation of underlying neurobiological processes (Bonifay et al., 2017), and limits in deriving manifest variable scale composites (Hare, Neumann, & Mokros, 2018). In light of these alternative model limitations, our results support use of the seven first-order factors as a guide for forming new composites with the TriPM items.[6]

Statistical models based on items from reliable and valid measures cannot be equated with the larger construct they are designed to represent (Hare & Neumann, 2008). Nevertheless, such models provide a basis for establishing a measure's internal construct validity (Smith et al., 2009; Strauss & Smith, 2009), and a viable statistical representation of the conceptual model (Hoyle, 2012), which can then be tested across cultures (Neumann, Schmitt, Carter, Embley, & Hare, 2012), and offender vs. non-offender samples (Neumann et al., 2015). At the most practical level, modeling items reveals how they perform as indicators of their respective factors, as well as how the items can be used to form coherent (measured) scale composites.

Conclusions and limitations. The current results provide evidence for a seven-factor model that replicated across samples. The results did not support a three-factor triarchic model, though some of the seven factors that emerged have parallels with other structural psychopathy models (Collison et al., 2016; Neumann et al., 2015). The current results are limited to countries from North America or Europe. Also, most of our samples were community-based but the results did generalize to an offender sample. Finally, the primary CFA approach used in this study was selected to help identify unidimensional and unambiguous factors, which has worked well in other psychopathy research (Seara-Cardoso, Queirós, Fernandes, Coutinho, & Neumann, 2019). As an alternative, investigators could use an ESEM approach and allow item cross-loadings, but

[6] In supplementary analyses we also assessed the influence of reverse keyed items. We modeled a factor that captured common method variance, but this model resulted in poor fit. Ray et al. (2016) did IRT analysis of ICU items and showed positively and negatively keyed items differ in terms of parametric information. A recent comparative IRT study by Tsang, Salekin, Coffey, and Cox (2018) echoed the Ray et al. results. Zhang, Noor, and Savalei (2016) demonstrated that presentation of all-positively worded items differed from a partially reverse worded version of a questionnaire and strongly cautioned against use of reverse keyed items.

this then results in shared items across scales and creates ambiguities in terms of their associations with external correlates. Despite these limitations, the findings of the current study have implications for measures anchored in the theoretical framework of the TriPM. We acknowledge the TriPM was not originally created to index a structural model and do not confuse our analyses of the TriPM with the theoretical constructs. The current results, as well as analytic results of various triarchic derivatives (Collison et al., 2019), indicate that triarchic items or scales do not adhere to a triarchic model. Creation of a unique item set with clear conceptual basis in the triarchic theory and sound psychometric properties may be a viable path forward for researchers interested in this framework. However, the seven-factor structure that emerged from the TriPM item set also provides a nuanced approach to assessing psychopathic personality that may advance both research and clinical interventions with the construct. Specifically, the Enjoy Hurting Others factor is not explicitly represented in current psychopathy measures and may have implications for risk assessment and differentiating variants of psychopathy (e.g., manipulative vs. aggressive subtypes; Hare et al., 2018). Additionally, the clear explication of unidimensional factors with some relevance to Boldness (Leader, Stress-immune, Positive self-image) allows researchers to conduct person-centered analyses to explore the viability of the proposed 'bold' psychopath. Use of all seven emergent factors from the current study would provide an opportunity to uncover evidence for such a profile, if one exists. Overall, it appears that continued use of the three original TriPM scales can lead to theoretical ambiguity and statistical washout effects, which will hinder our understanding of a construct associated with huge impact in mental health and criminal justice systems (Hare et al., 2018). Indeed, we believe the multidimensionality of the three original TriPM scales should provide a big caution to investigators who seek to uncover meaningful associations between the original TriPM scales and critical external correlates, as well as the genetic basis of psychopathic features. Furthermore, the seven factors that emerged from the current study can be used to integrate the TriPM item set more closely to existing measures of psychopathy (e.g., callousness & overt antisociality). Our results comparing offenders and non-offenders suggest that poor self-image, enjoyment in hurting others, and overt antisociality may be a viable profile for understanding individuals with psychopathic features. In contrast, our results revealed little differentiation between offenders and non-offenders in terms of stress immunity and leadership capacities. These latter results raise questions about the utility of such 'adaptive' features and whether they reflect any aspect of psychopathic personality. Taken together, our overall findings are in alignment with a statement by Crego and Widiger (2015), "It should go without saying that what makes a personality disorder a disorder is the presence of maladjustment, not superior adjustment" (p. 672). Enjoyment in hurting others, combined with overt antisociality, is most definitely pathological given what we consider ourselves to be, a social species.

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Table 1. *Confirmatory & exploratory factor analysis results*

TriPM Model	CFI	RMSEA	90% CI	WLSMV-X^2(dfs)	*M* loading (range)
Original item set (CFA)					
3-factor Omnibus	.76	.08	.08-.08	11639.65 (1592)	.65 (.13, .86)
1-general/3-specific*	.90	.05	.04-.05	5402.59 (1534)	g: .42 (-.22, .82) s: .45 (-.03, .80)
1-factor Bold items	.81	.13	.12-.13	2783.99 (152)	.59 (.20, .78)
1-factor Mean items	.88	.12	.14-.12	2416 (152)	.70 (.46, .83)
1-factor Disinhib. items	.92	.08	.07-.08	1303.13 (170)	.65 (.42, .80)
Original item set (EFA)					
3-factor Bold items	.93	.08	.07-.08	1070.12 (117)	.67 (.42, .91)
2-factor Mean items	.97	.06	.05-.06	721.61 (134)	.76 (.61, .88)
2-factor Disinhibit items	.96	.05	.05-.06	687.33 (151)	.67 (.50, .91)
7-factor TriPM 58-items	.97	.03	.02-.03	2606.78 (1268)	.58 (-.33, .89)
Reduced item set (CFA)					
3-factor Bold items	.93	.08	.08-.09	763.68 (74)	.71 (.52, .84)
2-factor Mean items	.97	.07	.06-.07	440.55 (64)	.78 (.63, .89)
2-factor Disinhib. items	.96	.05	.05-.06	318.70 (64)	.70 (.50, .82)
7-factor Omnibus (s1)	.92	.04	.04-.05	2847.71 (719)	.73 (.42, .89)
7-factor Omnibus (s2)	.90	.06	.04-.06	2094.89 (719)	.70 (.16, .93)
7-factor Omnibus (s3)	.90	.06	.04-.05	2078.54 (719)	.70 (.16, .92)
7-factor Omnibus (s4)	.86	.04	.04-.05	1799.45 (719)	.65 (.26, .91)
7-factor Omnibus (s5)	.86	.05	.05-.06	1771.09 (719)	.67 (.44, .89)
7-factor Omnibus (s6)	.90	.06	.05-.06	1059.90 (719)	.70 (.40, .92)
Reduced item set supplementary (CFA)*					
3-factor Omnibus	.78	.09	.09-.10	6823.64 (737)	.66 (.35, .87)
1-general/3-specific*	.90	.06	.05-.06	3310.98 (697)	g: .40 (-.24, .83) s: .46 (.03, .83)
1-factor Bold items	.81	.15	.15-.16	2011.18 (77)	.62 (.44, .79)
1-factor Mean items	.86	.16	.15-.16	1772.63 (65)	.72 (.56, .84)
1-factor Disinhib. items	.88	.10	.09-.11	741.41 (65)	.64 (.44, .78)

*Bi-factor model: 1 general (g) factor, all items loading, 3 specific (s) factors (bold, mean, disinhibition) represented by their respective items. General is orthogonal to specific factors.
**All supplementary CFAs were run using Sample 1 to be consistent with our initial reduced item set analyses and to allow direct model comparisons within sample.

Table 2. *Latent Correlations among Emergent TriPM factors*

	1.	2.	3.	4.	5.	6.	7.
Sample 1 (N = 1064)							
Boldness							
1. Leader	-						
2. Positive Self	.59	-					
3. Stress Immune	.61	.66	-				
Meanness							
4. Callous	-.05*ns*	-.32	.11	-			
5. Enjoy Hurting	.27	-.22	.23	.57	-		
Disinhibition							
6. Impulsive	-.12	-.67	-.35	.32	.55	-	
7. Antisocial	.11	-.35	.01*ns*	.43	.80	.67	-
Sample 2 (N = 603)							
	1.	2.	3.	4.	5.	6.	7.
Boldness							
1. Leader	-						
2. Positive Self	.54	-					
3. Stress Immune	.58	.67	-				
Meanness							
4. Callous	-.03*ns*	-.26	.17	-			
5. Enjoy Hurting	.20	-.37	.23	.61	-		
Disinhibition							
6. Impulsive	-.17	-.73	-.40	.28	.55	-	
7. Antisocial	.02*ns*	-.47	-.02*ns*	.38	.75	.70	-
Sample 3 (N = 591)							
	1.	2.	3.	4.	5.	6.	7.
Boldness							
1. Leader	-						
2. Positive Self	.53	-					
3. Stress Immune	.57	.66	-				
Meanness							
4. Callous	-.03*ns*	-.25	.18	-			
5. Enjoy Hurting	.21	-.37	.25	.62	-		
Disinhibition							
6. Impulsive	-.16	-.74	-.40	.27	.54	-	
7. Antisocial	.02*ns*	-.48	-.01*ns*	.38	.75	.69	-

Sample 4 (N = 511)							
	1.	2.	3.	4.	5.	6.	7.
Boldness							
1. Leader	-						
2. Positive Self	.34	-					
3. Stress Immune	.48	.65	-				
Meanness							
4. Callous	.12	-.29	.29	-			
5. Enjoy Hurting	.54	-.26	.37	.65	-		
Disinhibition							
6. Impulsive	.26	-.64	-.12	.37	.70	-	
7. Antisocial	.18	-.35	.05*ns*	.41	.75	.54	-
Sample 5 (N = 495)							
	1.	2.	3.	4.	5.	6.	7.
Boldness							
1. Leader	-						
2. Positive Self	.49	-					
3. Stress Immune	.57	.54	-				
Meanness							
4. Callous	.02*ns*	-.31	.19	-			
5. Enjoy Hurting	.41	-.30	.33	.42	-		
Disinhibition							
6. Impulsive	.21	-.54	-.21	.13	.71	-	
7. Antisocial	.14	-.48	.08*ns*	.41	.76	.65	-
Sample 6 (N = 150)							
	1.	2.	3.	4.	5.	6.	7.
Boldness							
1. Leader	-						
2. Positive Self	.47	-					
3. Stress Immune	.59	.61	-				
Meanness							
4. Callous	.34	*-.13ns*	.50	-			
5. Enjoy Hurting	.56	*-.15ns*	.51	.70	-		
Disinhibition							
6. Impulsive	.18	-.64	*-.02ns*	.56	.69	-	
7. Antisocial	.18	*-.11ns*	*.03ns*	.32	.64	.58	-

Note: All correlations are significant at $p < .05$ unless otherwise noted.

Table 3. *Correlations Among Latent TriPM Factors and External Correlates in Sample 1 (N = 1064)*

	Original TriPM Factor	**Revised TriPM Subfactors**		
	Boldness	*Leader*	*Stress-Immunity*	*Positive Self-image*
AUDIT	.05	.13[a]	.01[b]	-.11[c]
THQ	-.01	.06[a]	.02[a]	-.12[b]
PANAS-Positive	.54	.42[a]	.38[a]	.65[b]
PANAS-Negative	-.46	-.18[a]	-.42[b]	-.61[c]
SRP-ANT	.09	.16[a]	.20[a]	-.21[b]
	Meanness		*Callousness*	*Enjoy Hurting*
AUDIT	.27		.13[a]	.33[b]
THQ	-.03		-.06[a]	-.02[a]
PANAS-Positive	-.23		-.34[a]	-.05[b]
PANAS-Negative	.16		.10[a]	.17[b]
SRP-ANT	.65		.39[a]	.72[b]
	Disinhibition		*Impulsivity*	*Antisociality*
AUDIT	.39		.30[a]	.40[b]
THQ	.13		.15[a]	.08[b]
PANAS-Positive	-.28		-.40[a]	-.12[b]
PANAS-Negative	.42		.50[a]	.27[b]
SRP-ANT	.70		.38[a]	.83[b]

Note: AUDIT= Alcohol Use Disorders Identification Test; THQ=Trauma History Questionnaire; PANAS=Positive and Negative Affective Schedule; SRP-ANT=Self-report Psychopathy Scale-Antisocial Subscale; Mismatching superscripts indicate that the correlations between the latent factors and the outcome variable are significantly different from one another at $p<.05$. All individual correlations were significant (*p's* < .05 - .001), except those below $r = .08$.

Table 4. *Correlations Among Latent TriPM Factors and External Correlates in Sample 2 (N = 603)*

	Original TriPM Factor	**Revised TriPM Subfactors**		
	Boldness	*Leader*	*Stress-Immunity*	*Positive Self-image*
Neuroticism	-.74	-.39[a]	-.72[b]	-.85[c]
Extraversion	.77	.72[a]	.58[b]	.67[c]
Openness	.11	.13[a]	.06[b]	.05[b]
Agreeableness	-.04	-.18[a]	-.14[a]	.26[c]
Conscientiousness	.48	.31[a]	.32[a]	.64[c]
	Meanness		*Callousness*	*Enjoy Hurting*
Neuroticism	.19		.09[a]	.22[b]
Extraversion	-.13		-.23[a]	.07[b]
Openness	-.26		-.27[a]	-.11[b]
Agreeableness	-.80		-.73[a]	-.71[a]
Conscientiousness	-.41		-.29[a]	-.44[b]
	Disinhibition		*Impulsivity*	*Antisociality*
Neuroticism	.59		.75[a]	.41[b]
Extraversion	-.21		-.30[a]	-.11[b]
Openness	.05		.08[a]	.02[b]
Agreeableness	-.50		-.38[a]	-.54[b]
Conscientiousness	-.73		-.78[a]	-.59[b]

Note: FFM domains were assessed using the IPIP-NEO-120; mismatching superscripts indicate that the correlations between the latent factors and the outcome variable are significantly different from one another at $p<.05$. All individual correlations were significant (p's < .05 - .001), except those below $r = .09$

Table 5. *Correlations Among Latent TriPM Factors and External Correlates in Sample 3 (N = 591)*

	Original TriPM Factor	**Revised TriPM Subfactors**		
	Boldness	*Leader*	*Stress-Immunity*	*Positive Self-image*
CAB-SU	.04	.01[a]	.15[b]	-.06[c]
CAB-ASB	.09	.13[a]	.24[b]	-.13[c]
CAB-IPV	-.09	.01[a]	-.08[b]	-.17[c]
	Meanness		*Callousness*	*Enjoy Hurting*
CAB-SU	.07		-.03[a]	.16[b]
CAB-ASB	.33		.16[a]	.43[b]
CAB-IPV	.09		.02[a]	.11[b]
	Disinhibition		*Impulsivity*	*Antisociality*
CAB-SU	.32		.27[a]	.37[b]
CAB-ASB	.48		.33[a]	.53[b]
CAB-IPV	.32		.33[a]	.29[a]

Note: CAB-SU=Crime and Analogous Behaviors-Substance Use scale; CAB-ASB=Crime and Analogous Behaviors-Antisocial Behavior scale; CAB-IPV=Crime and Analogous Behaviors-Intimate Partner Violence scale; mismatching superscripts indicate that the correlations between the latent factors and the outcome variable are significantly different from one another at $p<.05$. All individual correlations were significant (p's < .05 - .001), except those below $r = .11$

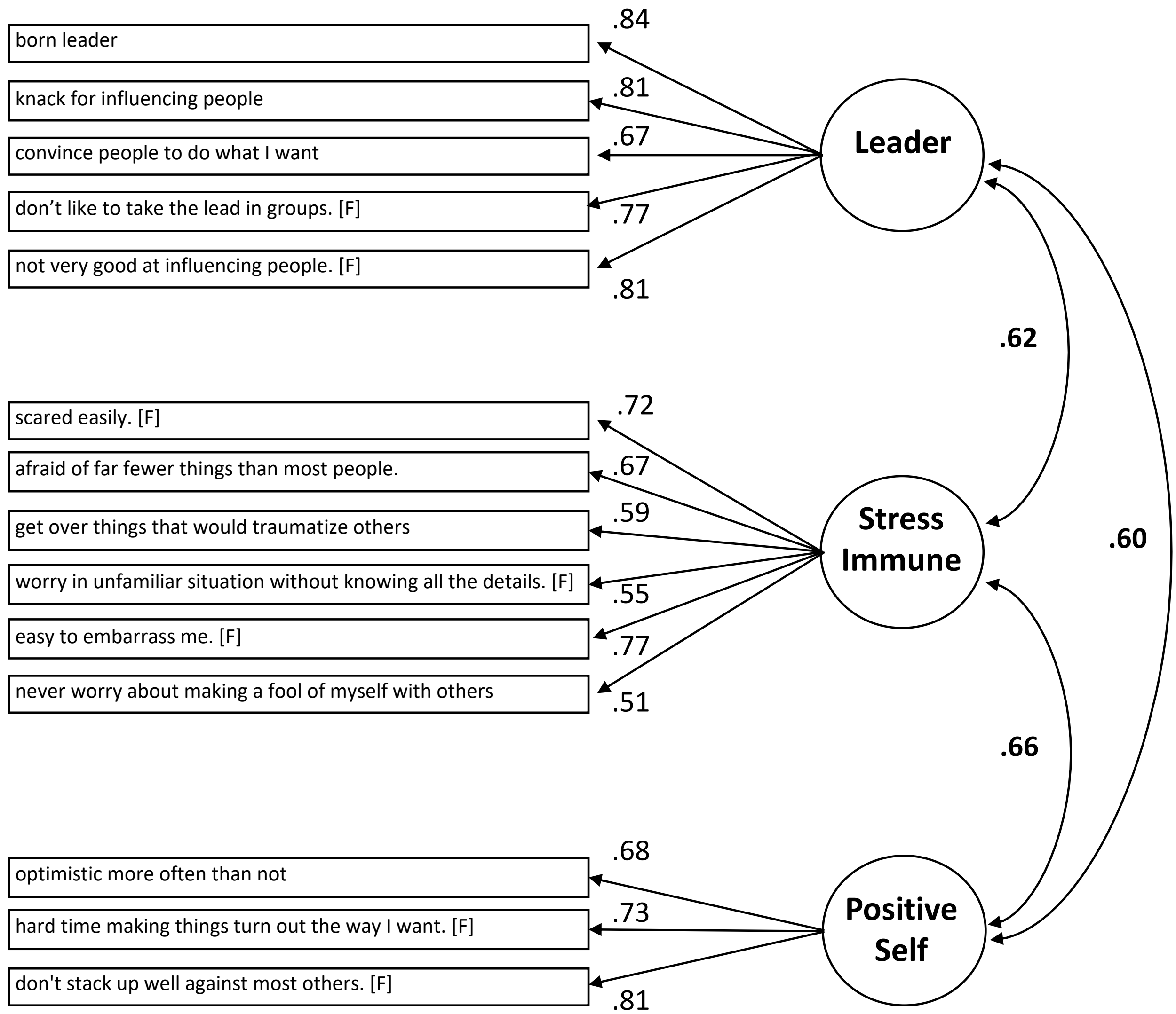


Figure 1. Boldness items: Three-factor model (Standardized parameters)

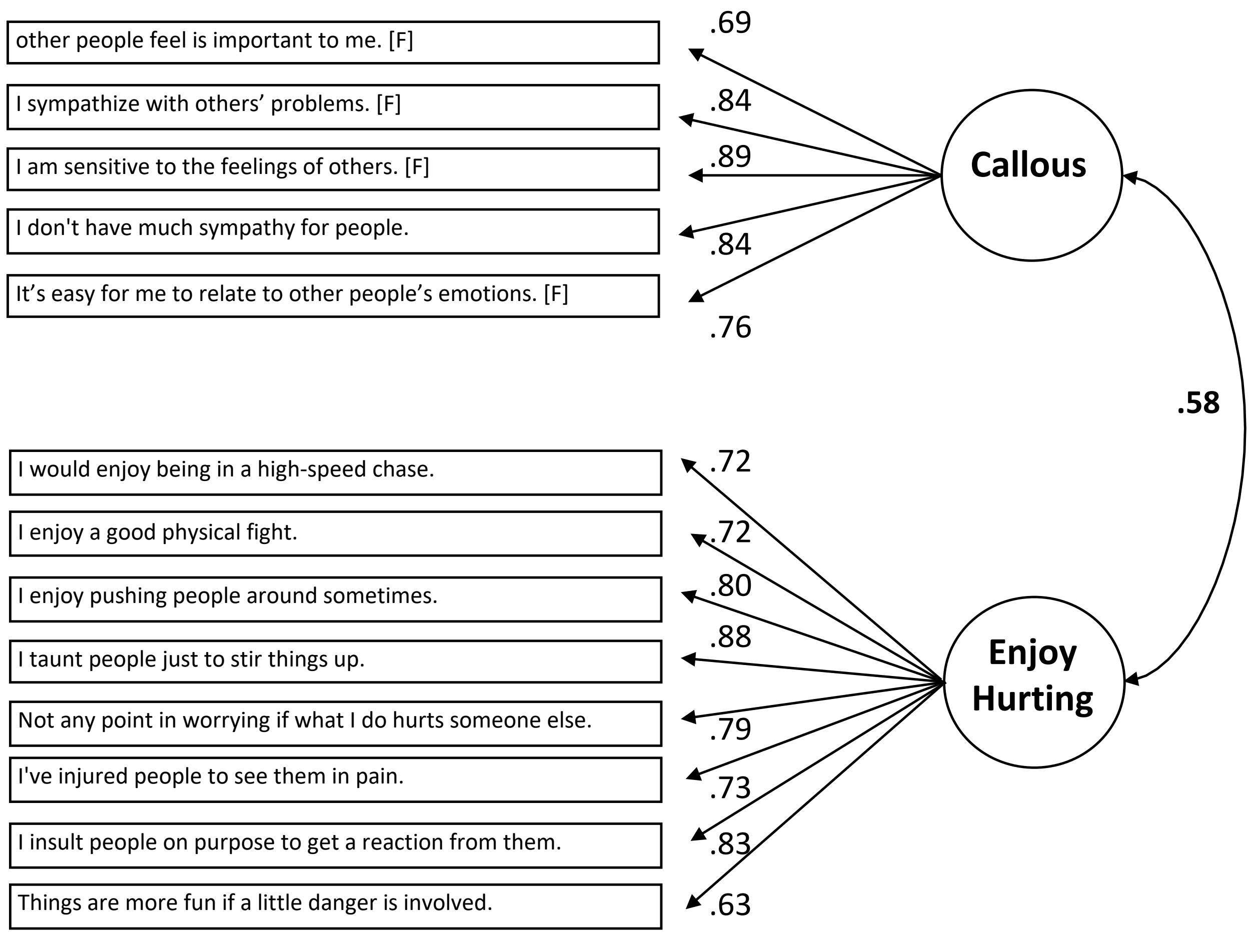


Figure 2. Meanness items: Two-factor model (Standardized parameters)

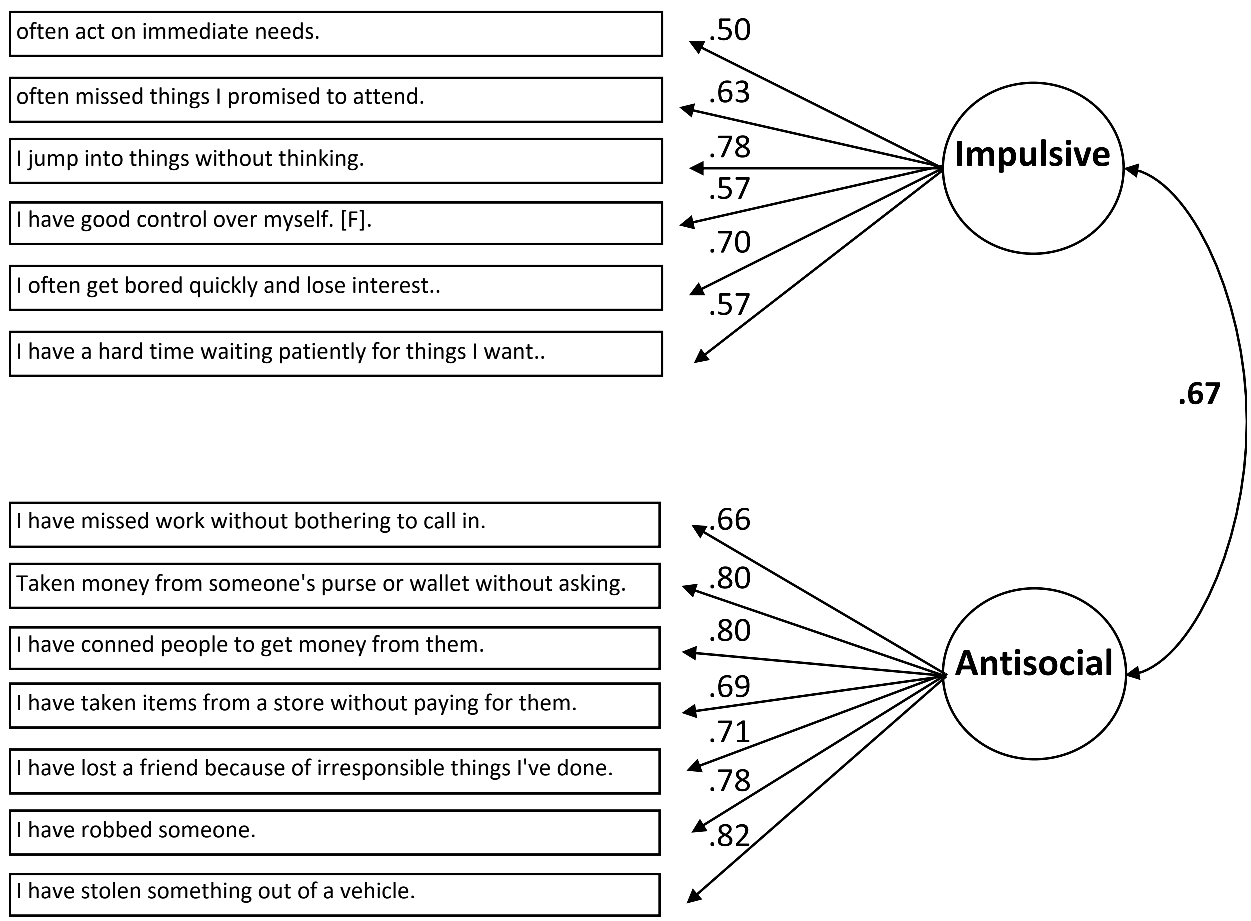
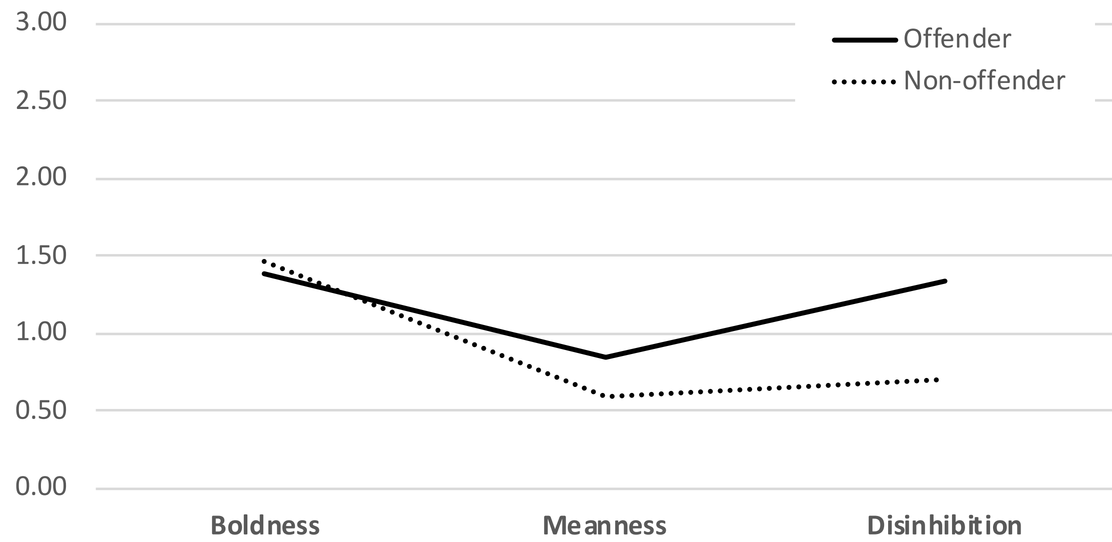
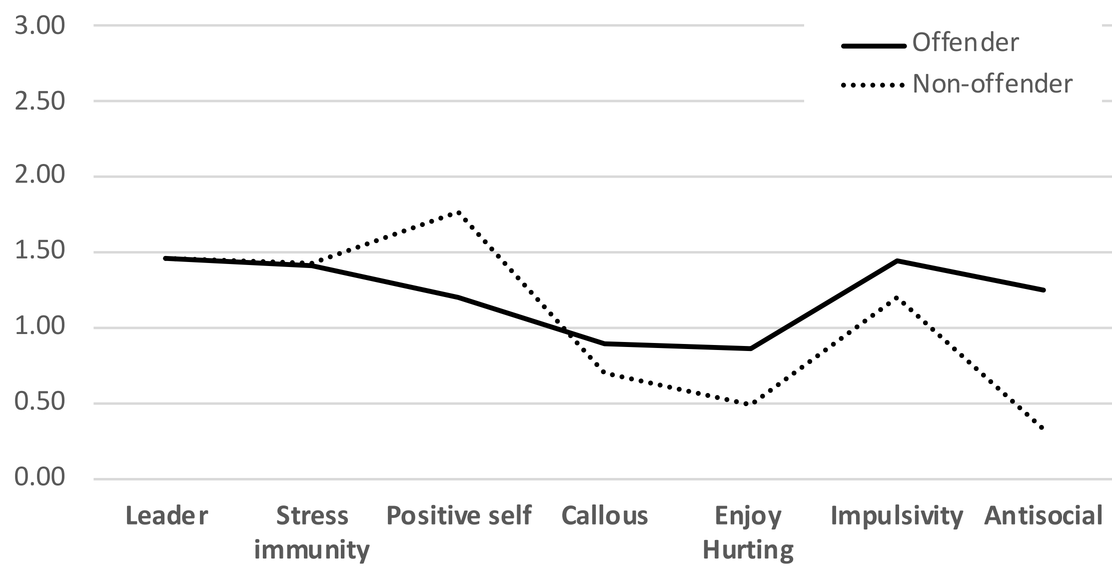


Figure 3. Disinhibition items: Two-factor model (Standardized parameters)

Figure 4

Discrimination between offender and Non-offender cases via three- versus seven-factor model





Note. Hedge's g for the three-factor composites (Boldness, Meanness, Disinhibition, respectively) were, .17, .58, 1.45, and seven factor composites (Leader, Stress-immune, Positive self-image; Callous, Enjoyment in hurting; Impulsivity, Antisociality, respectively) were, .01, .01, .86; .31, .79; .43, 1.90.

Supplementary Material

Table S1

Sample Descriptive Statistics

	Mean	*Std. Dev.*	*α*	*MIC*
Sample 1 (N = 1064)				
Boldness	1.49	0.49	0.87	0.27
Meanness	0.59	0.48	0.90	0.33
Disinhibition	0.74	0.50	0.88	0.28
Emergent factors				
Leader	1.51	0.76	0.83	0.50
Stress Immune	1.42	0.66	0.75	0.33
Positive Self	2.02	0.75	0.72	0.46
Callous	0.69	0.65	0.85	0.53
Enjoy Hurting	0.46	0.54	0.84	0.41
Impulsive	1.20	0.61	0.74	0.32
Antisocial	0.42	0.55	0.77	0.34
Sample 2 (N = 603)				
	Mean	*Std. Dev.*	*α*	*MIC*
Boldness	1.53	0.51	0.87	0.26
Meanness	0.58	0.45	0.89	0.32
Disinhibition	0.76	0.45	0.87	0.26
Emergent factors				
Leader	1.51	0.73	0.84	0.51
Stress Immune	1.42	0.62	0.72	0.30
Positive Self	1.99	0.74	0.73	0.49
Callous	0.74	0.65	0.87	0.57
Enjoy Hurting	0.43	0.47	0.79	0.33
Impulsive	1.25	0.54	0.68	0.25
Antisocial	0.39	0.48	0.74	0.30
Sample 3 (N = 591)				
	Mean	*Std. Dev.*	*α*	*MIC*
Boldness	1.52	0.51	0.87	0.25
Meanness	0.59	0.45	0.89	0.33
Disinhibition	0.76	0.45	0.86	0.26
Emergent factors				
Leader	1.51	0.73	0.84	0.50
Stress Immune	1.42	0.62	0.73	0.31
Positive Self	1.99	0.74	0.74	0.48
Callous	0.75	0.65	0.82	0.54
Enjoy Hurting	0.43	0.47	0.80	0.34
Impulsive	1.24	0.54	0.68	0.26
Antisocial	0.38	0.48	0.74	0.30

Sample 4 (N = 511)				
	Mean	*Std. Dev.*	*α*	*MIC*
Boldness	1.44	0.44	0.82	0.20
Meanness	0.57	0.40	0.86	0.27
Disinhibition	0.68	0.34	0.80	0.19
Emergent factors				
Leader	1.37	0.66	0.79	0.43
Stress Immune	1.34	0.58	0.70	0.28
Positive Self	1.91	0.57	0.45	0.21
Callous	0.61	0.49	0.65	0.30
Enjoy Hurting	0.52	0.50	0.81	0.35
Impulsive	1.29	0.49	0.60	0.20
Antisocial	0.23	0.35	0.63	0.24
Sample 5 (N = 465)				
	Mean	*Std. Dev.*	*α*	*MIC*
Boldness	1.37	0.44	0.82	0.20
Meanness	0.63	0.40	0.83	0.22
Disinhibition	0.56	0.39	0.85	0.23
Emergent factors				
Leader	1.41	0.63	0.79	0.42
Stress Immune	1.50	0.60	0.73	0.31
Positive Self	0.93	0.57	0.47	0.23
Callous	0.71	0.55	0.69	0.32
Enjoy Hurting	0.57	0.51	0.79	0.34
Impulsive	1.00	0.56	0.70	0.28
Antisocial	0.23	0.39	0.69	0.28
Sample 6 (N = 150)				
	Mean	*Std. Dev.*	*α*	*MIC*
Boldness	1.45	0.46	0.80	0.17
Meanness	0.73	0.56	0.91	0.36
Disinhibition	1.32	0.65	0.88	0.26
Emergent factors				
Leader	1.27	0.74	0.82	0.47
Stress Immune	1.50	0.55	0.55	0.25
Positive Self	1.77	0.57	0.50	0.23
Callous	0.77	0.64	0.79	0.44
Enjoy Hurting	0.68	0.64	0.83	0.38
Impulsive	1.26	0.62	0.71	0.28
Antisocial	1.33	0.96	0.84	0.43

Note: TriPM means are presented in mean item format (i.e., sum scale total / number of scale items) to provide average endorsement level for scale items. TriPM items are scaled from 0 (false) – 3 (true); Std. Dev. = Standard Deviation; α = Cronbach's alpha; MIC=mean inter-item correlation

Supplementary Material

Table S2. *Seven factor exploratory structural equation modeling (ESEM) results*

Boldness items	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**
1	**.48**	.11	.03	-.33	.00	-.23	.04
4*	.34	-.01	.14	-.06	-.19	.26	.03
7*	.63	.07	.02	-.14	.22	-.26	-.03
10	**.76**	-.01	.32	-.15	-.07	.01	-.03
13	.13	**.71**	.20	-.09	.02	.02	-.27
16	**.32**	.29	-.17	-.03	-.10	-.39	.04
19	.02	**.80**	-.03	-.02	.27	.01	.11
22*	.46	.28	.08	-.12	.22	-.14	-.11
25*	.24	.41	.01	-.12	-.13	-.13	-.01
28	**.73**	-.01	-.07	.09	**.31**	.15	.04
32	**.57**	.05	-.08	.06	**.38**	.04	.04
35	**.53**	.12	.01	.04	-.22	.01	-.01
38	.06	**.62**	.06	.07	.21	-.04	.18
41	.12	**.68**	.04	-.01	-.20	.06	-.28
44	**.50**	.30	-.16	.18	-.03	-.03	-.04
47*	.45	.07	.18	.06	**-.34**	.35	-.02
50	**.35**	.38	-.25	-.06	-.05	-.21	-.03
54	**.47**	.02	.02	.03	.13	.01	-.04
57	-.01	**.88**	-.20	.04	.00	-.03	.12
Meanness items							
2	.08	.00	.03	**.71**	.01	-.01	-.01
6	.38	.01	**.42**	.04	-.05	.38	-.08
8*	-.05	.04	.27	.46	.23	.08	-.07
11	.04	.00	-.01	**.84**	-.04	.02	.00
14	.28	.03	**.48**	.12	.01	.24	-.07
17*	-.02	.19	.11	.23	.26	.34	-.03
20*	.10	-.02	.50	.58	.13	-.13	.03
23	-.10	.23	**.71**	.14	.02	.05	-.07
26	-.12	.21	**.71**	.17	.05	.09	.03
29	.06	.03	**.63**	.30	-.04	.00	-.01
33	.00	.07	.02	**.86**	-.13	.03	.02
36	.02	-.05	.30	**.69**	.14	-.01	.01
39*	-.10	.00	.23	.36	-.19	.02	.24
40	-.03	.03	**.77**	.01	-.11	-.05	.18
42	-.14	.25	**.64**	.20	.14	.08	.02
45	.49	-.06	**.23**	.02	-.01	.49	.03
48*	-.01	-.03	.66	.31	-.06	-.01	.07
52	-.01	-.03	.05	**.73**	-.15	.04	-.04
55*	.09	-.10	.49	.55	-.02	-.14	.08
Disinhibition items							
3	-.04	.10	-.14	-.05	.05	**.54**	.06
5	-.12	.05	-.01	.03	-.04	**.42**	.36
9*	.08	.01	.29	-.10	.01	.54	.23
12	.07	-.02	.21	.03	.01	.24	**.39**
15	.12	-.01	.20	-.15	-.03	**.74**	.02
18*	-.10	.00	.07	.01	.06	.21	.46
21	-.30	-.03	-.07	.12	-.29	**.48**	.15
24	-.01	.06	.40	-.02	.12	.04	**.53**
27*	-.19	-.02	.25	-.05	.27	.29	-.03
30*	-.10	.05	-.01	.14	-.20	.34	.44
31	-.16	-.03	.02	.11	.12	**.58**	.02
34	-.01	.12	.50	.04	-.01	.08	**.41**
37*	.04	-.03	.32	-.05	.03	.55	.10
43	.02	-.02	.24	-.01	.21	.09	**.51**
46	-.22	.03	-.07	-.01	.17	**.57**	-.01
49	.03	-.01	.30	-.03	-.02	.31	**.31**
51*	-.05	.04	.43	-.01	-.11	.36	.27
53	.11	-.06	.66	-.02	-.09	-.03	**.36**
56*	.04	-.08	.15	-.01	.01	.42	.41
58	.09	-.02	.58	-.01	.00	-.03	**.47**

Note. Bolded items & loadings for 7-factor model. * = items omitted from 7-factor model. Bordered cells reflect item cross-loadings