

Refining the relationship between psychopathy, aggression, and rule-breaking by gender: A comparison of the Triarchic and Septarchic models of Psychopathy.

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Abstract

Previous research has established relationships between the Triarchic model of psychopathy, defined by the TriPM, and aggression. However, recent research has suggested that the TriPM may be better conceptualised as having seven factors (the septarchic model). In a community sample ($N = 404$), we analysed measures of aggression and rule-breaking against the TriPM at the three-factor and seven-factor levels, differentiating by gender. Consistent with the septarchic conceptualisation, some factors under each of the three TriPM domains showed different relationships to aggression. For instance, the septarchic subscale of 'Enjoy Hurting' associated with all measures of aggression while 'Callous' had no or weak relationships. The 'Antisocial' scale was associated with proactive aggression (but not reactive aggression) while the 'Impulsive' scale showed the opposite pattern. Few gender differences emerged in the relationships between psychopathy and gender. Overall, the septarchic model revealed relationships between psychopathy and aggression that are not apparent from the triarchic model and thus, may allow a more refined picture of aggression and psychopathy.

Keywords: psychopathy, aggression, triarchic, septarchic, men, women, SEM, CFA

Highlights

- Unique relationships emerged between 7-factor psychopathy subscales and aggression
- Enjoy hurting associated with all types of aggression
- No or weak associations were found between callous and aggression
- There were few gender differences related to psychopathy

1. Introduction

The triarchic model of psychopathy (TriPM; Patrick et al. 2009) defines psychopathy as comprising three domains; Boldness, Meanness and Disinhibition. Boldness represents an ability to bounce-back following adversity, calmness under pressure, and high self-confidence. Meanness reflects cruelty, disdain, and a lack of empathy. Disinhibition represents impulsivity, a failure to plan, and focussing on immediate gratification.

However, recent analysis of the TriPM has suggested that more factors may be apparent (Collison et al. 2021). In factor analysis undertaken by Roy et al. (2020), a seven-factor model emerged. Boldness comprised of three scales: ‘leader’, relating to influencing and taking charge, ‘stress immunity’, representing a lack of fear and an ability to bounce back, and ‘positive self’, comprising optimism and self-confidence. Tri-PM Meanness consisted of two factors: ‘callous’, representing a lack of empathy and sensitivity towards others, and ‘enjoy hurting’, reflecting active aggression and cruel behaviours. Disinhibition also had two factors: ‘impulsive’, comprising impatience, a lack of planning and instant gratification, and ‘antisocial’, covering conning, theft, and irresponsibility.

If Roy et al.’s (2020) model is correct, it may have implications for previously identified relationships between particular TriPM domains, and aggressive and rule-breaking behaviours, characteristic of the disorder (Patrick et al., 2009). Meanness and Disinhibition scores have consistently emerged as predictors of general, reactive/impulsive, and social aggression (Donnellan & Burt, 2016; Gray et al., 2019). Both have also been associated with premeditated aggression, and Disinhibition with impulsive aggression (Fernandez et al., 2019; Gray et al., 2019). Contrastingly, Boldness appears protective for social aggression (Donnellan & Burt, 2016) and hostility (Fernandez et al., 2019), but may have unique associations with proactive aggression (Gray et al., 2019). Given Roy et al.’s proposed

model, some of these associations may be driven by particular septarchic subscales, or the subscales may have different external correlates than those identified in the literature. For example, ‘Callous’ and ‘Enjoy Hurting’ might associate differently with different forms of aggression despite being grouped under ‘Meanness’ in the TriPM. Hence, the associations that measures of aggression and rule-breaking behaviours have with both the TriPM and its septarchic version require exploration.

The role of gender in the expression of psychopathy has attracted increasing interest (e.g., Gray & Snowden, 2016; Moffett et al., 2020). However, many studies report findings for mixed-gender samples without taking account of possible gender differences in the relationships between psychopathy and aggression (Donnellan & Burt, 2016; Fernandez et al., 2019). Where gender-specific analyses for aggressive behaviour have been undertaken, they suggest that men are more physically aggressive while women are more socially and verbally aggressive (Smith et al., 2020; Wynn et al., 2012). As this research area has received relatively little attention, the associations between the septarchic model of psychopathy and its behavioural correlates should be explored, alongside investigating whether gender differences exist in these associations.

To address these research gaps and further examine the validity of the septarchic psychopathy model, the present study aimed to: (1) replicate the triarchic and septarchic factor structures in the study sample, (2) examine whether there is measurement equivalence between genders in the two conceptualisations of psychopathy, (3) assess the relationships between the scales of psychopathy and measures of aggression for both the three- and seven-factor models, (4) examine possible gender differences in these relationships.

2. Material and Methods

2.1 Participants

An opportunistic, community-based, sample was recruited using social media. It was advertised as suitable for ages 18-50. Participants who were not first language English speakers were excluded due to reading fluency required for the measures.

In total, 708 participants were recruited. Those who did not complete all questionnaires ($n = 287$) or who failed any of the attention checks ($n = 17$) were excluded, leaving a remaining sample of $N = 404$ (258 female). The sample size for both genders approached or exceeded that required for point of stability for correlational analysis (Schönbrodt & Perugini, 2013).

The sample had a mean age of 29.50 ($SD = 9.11$). Participants were White (87.4%), Asian or Asian British (5.2%), mixed ethnicity (2.5%) and Black or Black British (1.5%). 43.3% of the sample held an undergraduate degree, 23.5% held postgraduate qualifications and 24.3% held O-Levels, A-Levels or equivalent qualifications.

XXXXX University College of Human and Health Sciences granted ethical approval for the study. Testing took place between June and August 2020. Community participants could enter a draw to win one of fifty £20 shopping vouchers.

2.2 Materials

2.2.1 Triarchic Psychopathy Measure

The TriPM (Patrick, 2010) comprises 58 items across three domains: Boldness (19 items), Meanness (19 items) and Disinhibition (20 items). Participants respond to questions on a 4-point Likert scale (1 = *true*, 2 = *mostly true*, 3 = *mostly false*, 4 = *false*), each scored from 0 – 3. Higher domain scores indicate greater levels of that psychopathy facet.

2.2.2 Reactive and Proactive Aggression

The Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006) consists

of 23 questions, 12 comprising the proactive aggression scale, and 11 the reactive aggression scale. Participants indicate on a three-point Likert scale (0 = *never*, 1 = *sometimes*, 2 = *often*) how frequently they undertake various forms of aggressive behaviour.

2.2.3 Physical Aggression, Social Aggression and Rule Breaking

The 32-item Subtypes of Antisocial Behaviour questionnaire (STAB; Burt & Donnellan, 2009) indexes physical aggression (10 items), social aggression (11 items), and rule-breaking (11 items). It uses a five-point Likert scale (1 = *never*, 2 = *hardly ever*, 3 = *sometimes*, 4 = *frequently*, 5 = *nearly all the time*) to capture how often respondents engaged in certain aggressive or rule-breaking behaviours in the past year.

Each measure included an attention check question, to allow removal of careless responders.

2.3 Procedure

The study was delivered online with Gorilla Experiment Builder (www.gorilla.sc; Anwyl-Irvine et al., 2019). Participants were given study information on-screen and informed of their right to withdraw from the research throughout the study without justification. Demographic data was collected, participants provided information related to an experimental task (not reported here) and completed the TriPM, the RPQ and the STAB. They were debriefed on-screen and thanked for participating.

2.4 Data Analysis

TriPM scores were converted to septarchic scores (see Roy et al., 2020). Missing questionnaire items were prorated using completed subscale scores where less than 25% responses were missing. As with Roy et al., latent variable modelling (CFA) tested the data fit to the three-factor and seven-factor models. Diagonally weighted least squares estimation was used given the ordinal nature of the questionnaire data (Li, 2016). Acceptable model fit

was judged by a Comparative Fit Index (CFI) of $\geq .90$ and an absolute Root Mean Square Error of Approximation (RMSEA) index of $\leq .08$.

To test for measurement equivalence between genders, multi-group measurement invariance testing was applied using the methods suggested by Van de Schoot et al. (2012).

The relationship between the two psychopathy models and aggression was assessed using two methods: simple zero-order correlations and structural equation models (SEM). All analyses were completed in R using lavaan (Rosseel, 2012).

Possible gender differences in the relationship between psychopathy and aggression were tested by profile agreement using the intraclass coefficient correlation (double entry) (McCrae, 2008). Individual correlations were compared by Fisher's r to Z transformations.

3. Results

Descriptive statistics and scale reliability analyses are provided in the supplemental materials (Table S1).

3.1 Replicating the three- and seven-factor models

Confirmatory factor analyses (CFA) were completed for both psychopathy models (Table 1). The three-factor CFA provided only a partial fit; the RSMEA reached acceptable levels, but the TLI and CFI showed a poor fit. Items on two of the factors demonstrated poor loading, including Boldness items 4 and 47, Meanness items 14 and 39, partly consistent with Roy et al.'s (2020) findings.

The seven-factor CFA produced an acceptable fit for all fit indices aside from the TLI. The incremental change in CFI from the three to the seven-factor model was greater than .01 suggesting that the seven-factor model was an improvement in fit.

3.2 Gender invariance in the three- and seven-factor models

Table 1 also displays the fit indices for both psychopathy models, separately for men and women. The results between genders were similar. The seven-factor model produced significantly better fits than the three-factor model. The similarity of fits for both models, across genders, suggests a degree of configural invariance (van de Schoot et al., 2012).

To further test the invariance, the data were fit with a model allowing all parameters to be estimated separately by gender. Metric invariance was tested by constraining the factor loadings equally across the groups. For the three-factor model the reduction in fit was significant ($\Delta\chi^2 = 76.19$, $df = 55$, $p = .031$) demonstrating a lack of metric invariance (Table 2). Contrastingly, in the seven-factor model, the test indicated metric invariance between genders ($\Delta\chi^2 = 44.55$, $df = 33$, $p = .086$). Therefore, scalar invariance was tested for the seven-factor model. However, this yielded a significant reduction in fit from the metric model ($\Delta\chi^2 = 73.68$, $df = 33$, $p < .001$). The analysis identified several parameters which should be released to establish partial metric invariance: items 44 (Stress Immune), 14, 40 and 45 (Enjoy Hurting), 15 and 46 (Impulsive), and 24, 34, 43 and 58 (Antisocial). The study did not aim to refine the model, therefore subsequent models were not generated.

3.3 Associations between the three- and seven-factor models and rule-breaking and aggression

Next, the relationship of each psychopathy model to different types of aggression and rule-breaking was examined. Firstly, we used structural equation models (SEM). However, this analysis produces estimates of path weights based on the scale once the variance shared with the other scales is removed. Hence, these ‘residualised’ scales are not the same as the original construct measured by the TriPM, leading to problems in interpretation (Lynam et al., 2006). Therefore, the zero-order coefficients are also reported as recommended by Lynam et al. As these analyses produced a large number of correlations and path weights, we

adopted a conservative criterion ($\alpha = .001$) for significance.

Results are shown in Tables 3 and 4. For the three-factor model the results were similar across all the aggression measures. Boldness was not significantly related to any of the measures, while both Meanness and Disinhibition were positively related to aggression often with 'large' effect sizes. The only exception was the rule-breaking scale of the STAB; while Meanness and Disinhibition were positively related at the zero-level correlation, in the SEM, Meanness no longer predicted rule-breaking while the association with the Disinhibition increased.

For the seven-factor model, several interesting results emerged. Firstly, for those scales underneath Boldness, Positive-self was negatively associated with measures of aggression, with those for Reactive, Physical and Social Aggression being significant (though some of these effects were not present in the SEM). The Stress Immune scale did not show any zero-order correlations with the measures of aggression. However, in the SEM it was negatively related to Social Aggression. The Leader scale was positively, though weakly, associated with Proactive Aggression.

Both the Callous and Enjoy Hurting subscales underneath TriPM Meanness were positively associated with the measures of aggression although the effect sizes for the Callous scale were smaller than those for the Enjoy Hurting scale (where there were medium and large effect sizes). In the SEM the Callous scale was unrelated to any aggression measures.

For the Impulsive and Antisocial scales under TriPM Disinhibition, the zero-order correlations with aggression were significant and positive for both scales with medium effect sizes. However, in the SEM some differences arose. The Impulsive scale was no longer predictive of Proactive Aggression (while still being predictive of Reactive Aggression), while the Antisocial scale was no longer predictive of Reactive Aggression or Physical

Aggression (while remaining predictive of Proactive Aggression).

3.4 Gender differences in the associations between the three- and seven-factor psychopathy model and rule-breaking and aggression

The data were analysed as in section 3.3 but with separate analyses for men and women (Tables 3 and 4).

To examine if the relationship between psychopathy and aggression was the same or different for men and women, two analyses were performed. The first looked at overall ‘profile agreement’. Here, the levels of zero-order correlations between the measures of psychopathy and the measures of aggression were compared for men and women. The intraclass correlation with double entry (ICC_{DE}) was used as the measure of profile agreement with a score $> .70$ indicating that the profiles were similar (McCrae, 2008). The analysis was also repeated using the path weight from the SEM for each of the models. The second analysis compared the magnitude for each correlation (or path weight in SEM) for men and women between the measures of psychopathy and the measures of aggression. As this involved a large number of tests, we adopted a conservative alpha level for significance ($\alpha = .001$).

The ICC_{DE} for the three-factor model for the zero-order correlations ($ICC = .86$) and path weightings ($ICC = .81$) suggested high similarity in the pattern of results between men and women. The comparison of the correlation coefficients showed only one significant result. Boldness was negatively related to Physical Aggression for women but was positively related for men. The comparison of the path weighting showed only one significant result. Disinhibition had a higher path weighting for Proactive Aggression in men than in women.

The ICC_{DE} for the seven-factor model for the zero-order correlations ($ICC = .83$) and path weightings ($ICC = .73$) suggested high similarity in the pattern of results between men

and women. The comparison of the correlation coefficients showed only two significant results. The Stress Immune scale was negatively related to Physical Aggression for women but positively related for men. The Positive Self scale was negatively related to Physical Aggression for women, but not for men. The comparison of the path weighting showed no significant results.

4. Discussion

4.1 Three-factor model

For the overall sample, the three-factor model showed only a partial fit to the data in the CFA (the RMSEA was acceptable whereas the CFI was poor). This corresponds with some previous research (Roy et al., 2020), but not all (Paiva et al., 2020). Consistent with other findings (Donnellan & Burt, 2016; Gray et al. 2019; Paiva et al., 2020), Meanness and Disinhibition both related to all forms of aggression measured. They also related to rule-breaking in the zero-order correlations, but Meanness was not associated with rule-breaking in the SEM, probably due to its shared variance with Disinhibition. Interestingly, Boldness did not show significant relationships with any of the aggression measures or rule-breaking. This differs to previous studies finding positive associations between Boldness and proactive or premeditated forms of aggression (Gray et al., 2019; Paiva et al., 2020) but none, or even negative associations, with reactive or impulsive aggression (Gray et al., 2019; Paiva et al., 2020).

The three-factor model also showed only partial fit when the data were split by gender, though the fits were similar in both genders suggesting some configural invariance. However, this model did not show metric invariance across the genders which can be interpreted as there being different path loadings between the items and scale between men and women. The relationship of the factors to aggression and rule-breaking appeared highly

similar for both genders. The only notable exception was for Boldness which was positively related to Physical Aggression for men but negatively related for women. This difference may explain why Boldness was not significantly related to aggression for the whole sample.

Overall, these findings appear largely consistent with the previous literature on the relationships between the TriPM and aggression.

4.2 Seven-factor model

The seven-factor model provided a good fit to the data and was significantly better than the three-factor model, replicating Roy et al.'s (2020) findings. This was found for men and women when analysed separately. There was also metric invariance between genders indicating that the path loadings between items and scales was similar across genders. However, there was scalar invariance indicating that the intercepts differed between genders. Such a difference needs consideration if the data were to show differences in how the scales of psychopathy were related to aggression as they are not invariant for men and women.

The major aim of this study was to examine whether the different subscales of psychopathy as defined by the seven-factor model had different relationships to aggression. This was the case. For instance, while Boldness showed no relationship to aggression, the Positive-Self scale was negatively related to several forms of aggression, while the Leader scale was positively related to proactive aggression.

The two seven-factor scales underneath Meanness also showed different relationships to aggression. The Enjoy Hurting scale showed strong relationships to all forms of aggression. However, the Callous scale showed weaker relationships for the zero-order correlations and was not significant in the SEM.

Finally, while Disinhibition was associated with all forms of aggression, more nuanced results emerged with the seven-factor model. The Antisocial scale was more related

to Proactive aggression, while the Impulsive scale was more related to Reactive aggression. In the SEM, only the Antisocial scale related to Proactive aggression, and only the Impulsive scale related to Reactive aggression. Therefore, the seven-factor model appears to provide a more refined view of which of the many psychopathic traits are driving aggressive and rule-breaking behaviours.

4.3 Gender Differences in the Relationship between Psychopathy and Aggression

Overall, little difference emerged in the relationship between psychopathy and aggression between genders. However, a conservative alpha (.001) was used to minimise Type I errors, possibly increasing Type II errors. The most salient difference was in the relationship between Physical Aggression and Boldness, which was negative for women but positive for men. This finding also emerged in the seven-factor model as all three scales (Leader, Stress Immune, and Positive Self) showed gender differences (the latter two significant). Hence, men appear to be more aggressive if they see themselves as leaders. This may relate to other results in the domain of self-esteem where self-esteem related to perceived rank predicts aggression in young men but not young women (Canning et al., 2017).

4.4 Implications

In this study the seven-factor model has revealed relationships between particular psychopathy traits and aggression that are not apparent from the triarchic model. Further research would benefit from validating these findings in other community samples and exploring whether similar results emerge in forensic populations. If they do, particular traits could be therapeutically targeted to reduce aggression and associated recidivism in offending populations.

Notably, this study highlights sadistic tendencies as a target area for efforts to reduce

aggression. In the realm of dark personality research, psychopathy and sadism are two of four distinct aversive constructs comprising the *Dark Tetrad*, alongside narcissism and Machiavellianism (Paulhus, 2015). While callousness is a shared attribute, an appetite for cruelty is particular to sadism (Paulhus, 2015). Our findings highlight the substantial contribution of such appetitive cruelty in perpetuating acts of aggression, captured in part here by the septarchic Enjoy Hurting subscale; it was significantly related to all types of aggression, for men, women, and all participants together. Moreover, of the significant subscales for proactive and physical aggression, Enjoy Hurting was most strongly related for both. While cruel behaviours feature in the constellation of psychopathy traits, recent work suggests that sadism and psychopathy appear to be related, but separate, constructs (O’Connell & Marcus, 2019). Therefore, further research may wish to consider whether the relationship between Enjoy Hurting and aggression reflects sadism and the appetitive cruelty particular to the construct, or a feature of psychopathy.

4.5 Limitations

The main limitation of this study was the use of self-report measures. The difficulties of measuring psychopathy via self-report have been well-rehearsed but allow for gathering large amounts of data in community samples. As measuring aggression is also challenging, it would be interesting to use behavioural measures of aggression in relation to the TriPM. The second limitation was the use of a community sample. While the TriPM was designed for such samples, the same relationships may not appear in forensic samples where the overall levels of psychopathy, and aggression, are expected to be much higher.

4.5 Conclusions

The septarchic model of the TriPM shows that the original three factors are not unidimensional, and the data is better modelled with seven-factors. The data presented here

illustrates that these seven-factors show different relationships to aggression than the three-factor model, hence supporting the validity of using the seven-factor model. The seven-factor model also highlights particular traits to target in order to reduce aggression in offending populations.

References

- Anwyl-Irvine, A., Massonnié, J., Flitton, A., Kirkham, N., & Evershed, J. K. (2019). Gorilla in our Midst: An online behavioral experiment builder. *Behavior Research Methods*, 52, 388–407. <https://doi.org/10.3758/s13428-019-01237-x>
- Burt, S. A., & Donnellan, M. B. (2009). Development and validation of the subtypes of Antisocial Behavior Questionnaire. *Aggressive Behavior*, 35, 376-398. <https://doi.org/10.1002/ab.20314>
- Canning, A., Andrew, E., Murphy, R., Walker, J. S., & Snowden, R. J. (2017). Gender differences in the relationship between self-esteem and aggression in young people leaving care. *Violence and Gender*, 4(2), 49-54. <https://doi.org/10.1089/vio.2017.0002>
- Collison, K., Miller, J., & Lynam, D. (2021). Examining the factor structure and validity of the Triarchic Model of Psychopathy across measures. *Personality Disorders: Theory, Research, and Treatment*, 12 (2), 115-126. <https://doi.org/10.1037/per0000394>.
- Donnellan, M. B., & Burt, S. A. (2016). A further evaluation of the triarchic conceptualization of psychopathy in college students. *J Psychopathol Behav Assess*, 38, 172-182. <https://doi.org/10.1007/s10862-015-9512-z>
- Fernandez, D., Zabala, M. C., Ros, L., Martinez, M., Martinez, A., Latorre, J. M., & Ricarte, J. J. (2019). Testing the properties of the triarchic model of psychopathy in a community sample: Self-reported trait aggression and drug consumption associations.

Scandinavian Journal of Psychology, 60, 377–385. <https://doi.org/10.1111/sjop.12542>

Gray, N. S., Blumenthal, S., Shuker, R., Wood, H., Fonagy, P., & Snowden, R. J. (2019). The triarchic model of psychopathy and antisocial behavior: Results from an offender population with personality disorder. *Journal of Interpersonal Violence*, <https://doi.org/10.1177/0886260519853404>

Gray, N. S., & Snowden, R. J. (2016). Psychopathy in women: Prediction of criminality and violence in UK and USA psychiatric patients resident in the community. *Psychiatry Research*, 237, 339-343, <https://doi.org/10.1016/j.psychres.2016.01.014>

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods* 48, 936–949. <https://doi.org/10.3758/s13428-015-0619-7>

Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling: Cautionary tales from aggression and psychopathy. *Assessment*, 13(3), 328-341, <https://doi.org/10.1177/1073191106290562>.

McCrae, R. R. (2008). A note on some measures of profile agreement. *Journal of Personality Assessment*, 90(2), 105-109, <https://doi.org/10.1080/00223890701845104>

Moffett, S., Javdani, S., Miglin, R., & Sadeh, N. (2020). Examining latent profiles of psychopathy in a mixed-gender sample of juvenile detainees. *Personality Disorders: Theory, Research, and Treatment*, 11(4), 290.

O'Connell, D., & Marcus, D. K. (2019). A meta-analysis of the association between psychopathy and sadism in forensic samples. *Aggression and violent behavior*, 46, 109-115.

Paiva, T. O., Pasion, R., Patrick, C. J., Moreira, D., Almeida, P. R., & Barbosa, F. (2020). Further evaluation of the Triarchic Psychopathy Measure: Evidence from community

adult and prisoner samples from Portugal. *Psychological Assessment*, 32(3),
<https://doi.org/10.1037/per0000370>

Paulhus, D. L. (2014). Toward a taxonomy of dark personalities. *Current Directions in Psychological Science*, 23(6), 421-426.

Patrick, C. J. (2010). Triarchic psychopathy measure (TriPM). In PhenX (Ed.), Toolkit Online assessment catalog.

Patrick, C. J., Fowles, D. C., & Krueger, R. F. (2009). Triarchic conceptualization of psychopathy: Developmental origins of disinhibition, boldness, and meanness. *Development and Psychopathology*, 21, 913–938, <https://doi.org/10.1017/S0954579409000492>

Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., Stouthamer-Loeber, M., & Liu, J. (2006). The Reactive–Proactive Aggression Questionnaire: Differential correlates of reactive and proactive aggression in adolescent Boys. *Aggressive Behavior*, 32, 159-171., <https://doi.org/10.1002/ab.201115>

Rosseel, Y. (2012). ‘lavaan: An R Package for Structural Equation Modeling.’ *Journal of Statistical Software*, 48(2), 1–36. <https://www.jstatsoft.org/v48/i02/>.

Roy, S., Vize, C., Uzieblo, K., van Dongen, J. D. M., Miller, J., Lynam, D., Brazil, I., Yoon, D., Mokros, A., Gray, N. S., Snowden, R., & Neumann, C. S. (2020). Triarchic or septarchic?—Uncovering the Triarchic Psychopathy Measure’s (TriPM) structure. *Personality Disorders: Theory, Research, and Treatment*, 12(1), 1–15,
<https://doi.org/10.1037/per0000392>

Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize?. *Journal of Research in Personality*, 47(5), 609-612,
<https://doi.org/10.1016/j.jrp.2013.05.009>

Smith, J. M., Gacono, C. B., & Cunliffe, T. B. (2020). Female psychopathy and aggression: A study with incarcerated women and rorschach aggression scores. *Journal of Aggression, Maltreatment & Trauma*. <https://doi.org/10.1080/10926771.2020.1738614>

van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology*, 9(4), 486-492, <https://doi.org/10.1080/17405629.2012.686740>

Wynn, R., Høiseth, M. H., & Pettersen, G. (2012). Psychopathy in women: Theoretical and clinical perspectives. *International Journal of Women's Health*, 4, 257–263, <https://doi.org/10.2147/IJWH.S25518>

Table 1: Confirmatory factor analysis (CFA) results for the 3- and 7-factor models, by gender and for all participants.

Sample	Model	RMSEA [90% CI]	TLI	CFI	Δ CFI
All	3-factor	.070 [.067 - .072]	.79	.80	
	7-factor	.052 [.048 - .055]	.89	.90	.096*
Men	3-factor	.056 [.051 - .061]	.84	.85	
	7-factor	.041 [.031 - .049]	.92	.92	.076*
Women	3-factor	.069 [.066 - .072]	.79	.79	
	7-factor	.052 [.046 - .057]	.88	.89	.098*

RMSEA = Root Mean Square Error of Approximation, TLI = Tucker-Lewis Index, CFI = Comparative Fit Index, Δ CFI = change in CFI between 3- and 7-factor models. * significant Δ CFI ($p < .01$).

Table 2: Measurement invariance testing between genders

Model	Analysis Model	χ^2	df	RMSEA	TLI	CFI	<i>p</i>
3-factor	Configural invariance (A)	5856.90	3184	.065 [.062 - .067]	.80	.81	
	Metric invariance (B)	6287.16	3239	.068 [.066 - .071]	.78	.78	.031
	Scalar invariance (C)	6453.37	3294	.069 [.067 - .072]	.78	.78	< .001
7-factor	Configural invariance (D)	2102.71	1438	.048 [.043 - .052]	.89	.90	
	Metric invariance (E)	2254.71	1471	.051 [.047 - .056]	.88	.88	.086
	Scalar invariance (F)	2320.90	1504	.052 [.048 - .056]	.88	.88	<.001

χ^2 = chi-square, df = degrees of freedom, RMSEA = Root Mean Square Error of Approximation, TLI = Tucker-Lewis Index, CFI = Comparative Fit Index

Table 3: Zero-order coefficients and beta regression weights (standardised) among latent Tri-PM factors and proactive and reactive external correlates, by gender and for all participants

		Proactive Aggression						Reactive Aggression					
		Correlations (Spearman's rho)			Beta Regression Weights (Standardised)			Correlations (Spearman's rho)			Beta Regression Weights (Standardised)		
		All	Women	Men	All	Women	Men	All	Women	Men	All	Women	Men
TriPM	Boldness	.11	.03	.16	.11	.06	.14	-.09	-.16*	.03	-.10	-.14	.00
	Meanness	.47*	.42*	.52*	.20*	.26*	.15	.39*	.39*	.45*	.20	.16	.25*
	Disinhibition	.49*	.43*	.55*	.47*	.35*	.59* #	.52*	.50*	.55*	.42*	.39*	.48*
Septarchic	Leader	.15*	.10	.23*	.05	.11	-.04	.01	-.03	.14	.08	.04	.13
	Stress Immune	.11	.05	.09	.01	-.04	.07	-.06	-.16*	.05	-.15	-.14	-.07
	Positive Self	-.07	-.14	.06	-.02	-.12	.04	-.25*	-.29*	-.11	-.12	-.14	-.13
	Callous	.20*	.11	.25*	.01	-.01	.03	.15*	.09	.21*	-.01	-.04	.08
	Enjoy Hurting	.51*	.46*	.54*	.36*	.40*	.29*	.39*	.39*	.46*	.28*	.25*	.30*
	Impulsive	.36*	.35*	.37*	.09	.02	.22	.47*	.45*	.50*	.40*	.30*	.37*
	Antisocial	.43*	.40*	.47*	.36*	.26*	.45*	.33*	.33*	.37*	.11	.07	.16

* differs from zero $p < .001$

correlation or beta weight differs between genders, $p < .001$

Table 4: Zero-order coefficients and beta regression weights (standardised) among latent Tri-PM factors and physical and social aggression and rule-breaking external correlates, by gender and for all participants

		Sub Types of Antisocial Behaviour Comparison																	
		Physical Aggression						Social Aggression						Rule Breaking					
		Correlations (Spearman's rho)			Beta Regression Weights (Standardised)			Correlations (Spearman's rho)			Beta Regression Weights (Standardised)			Correlations (Spearman's rho)			Beta Regression Weights (Standardised)		
		All	Women	Men	All	Women	Men	All	Women	Men	All	Women	Men	All	Women	Men	All	Women	Men
TriPM	Boldness	.01	-.14*	.20**	-.01	-.11	.13	-.10	-.12	-.06	-.06	-.08	-.09	.04	-.06	.04	.04	.03	.13
	Meanness	.50*	.45*	.54*	.31*	.22*	.34*	.45*	.42*	.51*	.31*	.28*	.36*	.40*	.37*	.29*	.00	.10	-.10
	Disinhibition	.55*	.57*	.46*	.39*	.42*	.39*	.53*	.55*	.49*	.39*	.39*	.40*	.54*	.53*	.53*	.61*	.53*	.70*
Septarchic	Leader	.06	-.02	.20*	.02	-.01	.07	.06	.05	.17	.13	.12	.18	.01	-.06	.03	-.06	-.13	-.03
	Stress Immune	.01	-.15*	.17*#	-.14	-.18	.08	-.11	-.15	-.09	-.24*	-.28*	-.14	.11	.01	.05	.10	-.03	.16
	Positive Self	-.17*	-.26*	.02#	-.04	-.06	-.05	-.23*	-.25*	-.19*	-.07	.01	-.21	-.13	-.14	-.15	-.02	.14	-.11
	Callous	.22*	.10	.32*	.03	-.07	.16	.17*	.09	.20*	.05	.05	.09	.14	.06	.11	-.07	-.04	-.08
	Enjoy Hurting	.51*	.50*	.47*	.44*	.46*	.30*	.43*	.44*	.44*	.36*	.36*	.35*	.44*	.44*	.27*	.17	.23*	.06
	Impulsive	.48*	.48*	.46*	.26*	.18	.39*	.45*	.45*	.41*	.22*	.20*	.24*	.35*	.36*	.32*	.13	.12	.19
	Antisocial	.33*	.41*	.20*	.08	.18	.03	.40*	.38*	.42*	.21*	.24*	.19	.51*	.50*	.49*	.52*	.54*	.51*

* differs from zero $p < .001$

correlation or beta weight differs between genders, $p < .001$