

Psychopathy, borderline personality disorder, and emotional processing in incarcerated
women

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Abstract

15

16 One or two sentences providing a **basic introduction** to the field, comprehensible to a
17 scientist in any discipline. Two to three sentences of **more detailed background**,
18 comprehensible to scientists in related disciplines. One sentence clearly stating the **general**
19 **problem** being addressed by this particular study. One sentence summarizing the main
20 result (with the words “**here we show**” or their equivalent). Two or three sentences
21 explaining what the **main result** reveals in direct comparison to what was thought to be
22 the case previously, or how the main result adds to previous knowledge. One or two
23 sentences to put the results into a more **general context**. Two or three sentences to
24 provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

25

Keywords: keywords

26

Word count: X

Psychopathy, borderline personality disorder, and emotional processing in incarcerated women

Introduction

Psychopathy as a construct has undergone detailed iterations to annotate its numerous idiosyncrasies. Around 1.2% of American men and 0.5% of American women are believed to possess clinically significant levels of psychopathic traits (Barbara Burton & Fabian M. Saleh, 2020). While persistent antisocial conduct is commonly present, psychopathy is also uniquely characterized by absences – notably a deficiency in emotional reaction and a lack of empathy or remorse (De Brito et al., 2021; Sellbom & Drislane, 2021). It spans race, gender, socioeconomic status, and culture, and further possesses a kaleidoscope of consequences – from disturbed well-being to increased involvement in the criminal justice system. While it is believed to be present in around 1% of the general population, an estimated 15-25% of those incarcerated are likely to fall somewhere on the psychopathy spectrum (Barbara Burton & Fabian M. Saleh, 2020).

A discrimination in subtypes of psychopathy was pioneered by Karpman (1941), who proposed the existence of two groups: primary and secondary. Primary psychopaths are exceedingly low in anxiety and predisposed to be antisocial, whereas secondary psychopaths become callous and high in anxiety as a response to various vulnerabilities in the environment (Sellbom & Drislane, 2021). The most widely investigated measure of psychopathy to-date originates in Cleckley's (1976) conception of psychopathy. The framework is divided into interpersonal-affective – or Factor 1 – traits and lifestyle-antisocial – or Factor 2 – traits. Factor 1 traits include superficial charm, a grandiose sense of self-worth, and lack of empathy or remorse; Factor 2 traits are characterized by early behavioral problems and delinquency, as well as impulsivity and a proneness to boredom (De Brito et al., 2021). These factors are distinct (Hunt, Bornovalova, & Patrick, 2015) but not mutually exclusive; persons demonstrating high

interactions of Factor 1 and Factor 2 traits are considered high in psychopathic tendencies, and diluted exhibitions in one or the other consequentially fall lower on the spectrum (Verona, Sprague, & Javdani, 2012). The Psychopathy Checklist—Revised (PCL—R; Hare, 2003) borne from this composition, and it is the chief measure of psychopathy that will be utilized in the present study.

Discrepancies in our understanding of psychopathy as it pertains to women sparked interest in this discourse, namely a murky association with previously correlated externalizing disorders – such as antisocial personality disorder and narcissistic personality disorder (De Vogel & Lancel, 2016; Rutherford, Alterman, Cacciola, & McKay, 1998) – and the tendency for women to score lower than men across rating scales (Newhill, Vaughn, & DeLisi, 2010; Spormann, Mokros, & Schneider, 2023). While Cleckley’s criteria, are often considered immune to gender stereotypes, these divergences highlighted the possibility that researchers were examining the wrong traits, or perhaps searching for misrepresentative correlates (Vitale & Newman, 2001).

Recent studies examining gender differences have found women with psychopathy to possess less overall deficits in emotional processing, as well as show less physical violence while exhibiting heightened manipulative and self-destructive behaviors, possibly from learning how to compensate through socialization (for a review, see Efferson & Glenn, 2018); they are also more often diagnosed with borderline personality disorder compared to men with psychopathy (De Vogel & Lancel, 2016). Borderline personality disorder (BPD) is characterized by unstable and explosive emotional patterns. Those diagnosed with BPD often struggle to both maintain relationships and inhibit chaotic impulses (Clarkin & Posner, 2005). It is estimated that 1.4% of the adult U.S. population is eligible for BPD diagnosis; nearly 75% of those diagnosed are women (National Institute of Mental Health, 2023). Zlotnick, Rothschild, and Zimmerman (2002) found BPD-diagnosed women were more likely than BPD-diagnosed men to meet criteria for internalizing and impulse-defined comorbidities – such as eating disorder, panic disorder, and major depressive disorder.

These correlations paint an image of high levels of inner distress in the wake of negative affect for women with BPD, which may have interesting connotations for how it relates to coexisting conditions that also impact emotional regulation, such as psychopathy.

Alexithymia is a syndrome marked by hindrances in experiencing, identifying, and expressing emotions. Like psychopathy, the construct is multifaceted and possesses both cognitive and affective components (Goerlich, 2018). Decreased emotional awareness may thwart social development, making alexithymia highly pertinent to both daily functioning and the onset of psychiatric disorders. As traits of both psychopathy and BPD evidently alter emotional regulation and processing, it is likely associations would be found between its diagnosis and the presence of alexithymia. Ridings and Lutz-Zois (2014) suggested BPD may act as a mediator in the association between secondary psychopathy and alexithymia. A {-Burghart and Mier (2022)} meta-analysis by Burghart and Mier elicited positive associations between psychopathy and alexithymia, as well its sub-components – difficulty describing feelings, difficulty identifying feelings, and externally-oriented thinking. Examining gender as a moderator, they found the association between psychopathy and overall alexithymia to be stronger in women compared to men.

It is unclear how thoroughly these findings might translate onto clinical or special populations. Special populations are useful for research as they can provide valuable insight along the margins of spectra that may be overlooked. We now stand at an intersection of extremities, as this study aims to clarify how the interaction between psychopathy and borderline personality disorder may impact one's ability to experience, identify, or express emotions when impairments are more clinically severe.

Present Aims

Stimulating research continues to emerge regarding the relationship between psychopathy and BPD, as well as emotional dysregulation and BPD. However, the impact

BPD and psychopathy may have on women with respect to their ability to experience, identify, or express emotions is at present underexplored. Further, special populations are often underrepresented in research and thus critical to mapping out the spectrum of impact. A primary aim of the present study is to delineate the clinical presentation of psychopathy in incarcerated women as it intersects with borderline personality disorder and alexithymia. Poor empathy and emotional dysregulation render psychopathy a prevalent risk factor for severe and chronic violence. While criminality is not a certainty, understanding how the condition hardens along this lineage could have meaningful benefits in the clinical sphere and thus guide necessary treatment to lower both violent onset and recidivism rates. Treatment is especially pertinent for those in vulnerable populations who may be limited in access.

Contrary to male psychopathy, female psychopathy has been shown to possess a much stronger association with tendencies of borderline personality disorder (Sprague, Javdani, Sadeh, Newman, & Verona, 2012). It is hypothesized that borderline personality disorder will mediate the relationship between psychopathy and alexithymia (see below graphic, no clue how to reference right now). The literature has made abundantly clear the manifold expressions of psychopathy; as such, it is important this diversity is accounted for in our research. Results are likely to have implications for both forensic practice and neuroscientific theory.

Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

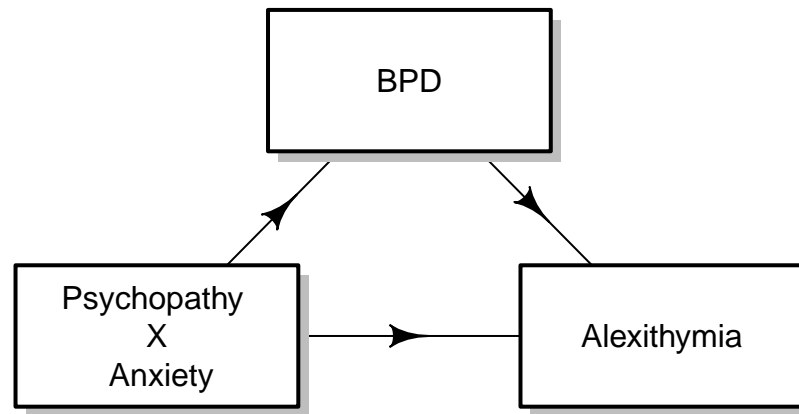


Figure 1

(#fig:simple plot of mediation relationship)

Participants

Measures

- make sure to note here why interaction

Procedure

Of the 156 total participants, 52 participants failed to complete one or more of the four assessments. Due to the nature of the variables, it was determined most ethical to simply remove participants who were missing data for any of the required assessments. A total of 104 participants remained for further analysis.

Data analysis

We used R (Version 4.3.2; R Core Team, 2023) and the R-packages *diagram* (Version 1.6.5; Soetaert, 2020), *dplyr* (Version 1.1.4; Wickham, François, Henry, Müller, & Vaughan, 2023), *forcats* (Version 1.0.0; Wickham, 2023a), *ggformula* (Version 0.12.0; Kaplan & Pruim, 2023), *ggplot2* (Version 3.4.4; Wickham, 2016), *ggsci* (Version 3.0.0; Xiao, 2023), *kableExtra* (Version 1.4.0; Zhu, 2024), *lattice* (Version 0.21.9; Sarkar, 2008), *lubridate* (Version 1.9.3; Grolemund & Wickham, 2011), *MASS* (Version 7.3.60; Venables & Ripley, 2002), *Matrix* (Version 1.6.1.1; Bates, Maechler, & Jagan, 2023), *mediation* (Imai, Keele, & Tingley, 2010; Imai, Keele, Tingley, & Yamamoto, 2011; Imai, Keele, & Yamamoto, 2010; Imai & Yamamoto, 2013; Version 4.5.0; Tingley, Yamamoto, Hirose, Keele, & Imai, 2014), *mosaic* (Version 1.9.0; Pruim, Kaplan, & Horton, 2017; Pruim, Kaplan, & Horton, 2023), *mosaicData* (Version 0.20.4; Pruim et al., 2023), *mvtnorm* (Version 1.2.4; Genz & Bretz, 2009), *papaja* (Version 0.1.2; Aust & Barth, 2023), *plot.matrix* (Version 1.6.2; Klinke, 2022), *psych* (Version 2.4.1; William Revelle, 2024), *purrr* (Version 1.0.2; Wickham & Henry, 2023), *readr* (Version 2.1.4; Wickham, Hester, & Bryan, 2023), *readxl* (Version 1.4.3; Wickham & Bryan, 2023), *sandwich* (Zeileis, 2004, 2006; Version 3.1.0; Zeileis, Köll, & Graham, 2020), *shape* (Version 1.4.6; Soetaert, 2021), *stargazer* (Version 5.2.3; Hlavac, 2022), *stringr* (Version 1.5.1; Wickham, 2023b), *tibble* (Version 3.2.1; Müller & Wickham, 2023), *tidyr* (Version 1.3.0; Wickham, Vaughan, & Girlich, 2023), *tidyverse* (Version 2.0.0; Wickham et al., 2019), and *tinylabels* (Version 0.2.4; Barth, 2023) for all our analyses.

Results

Descriptive statistics for the assessments of interest can be seen in Table 1.

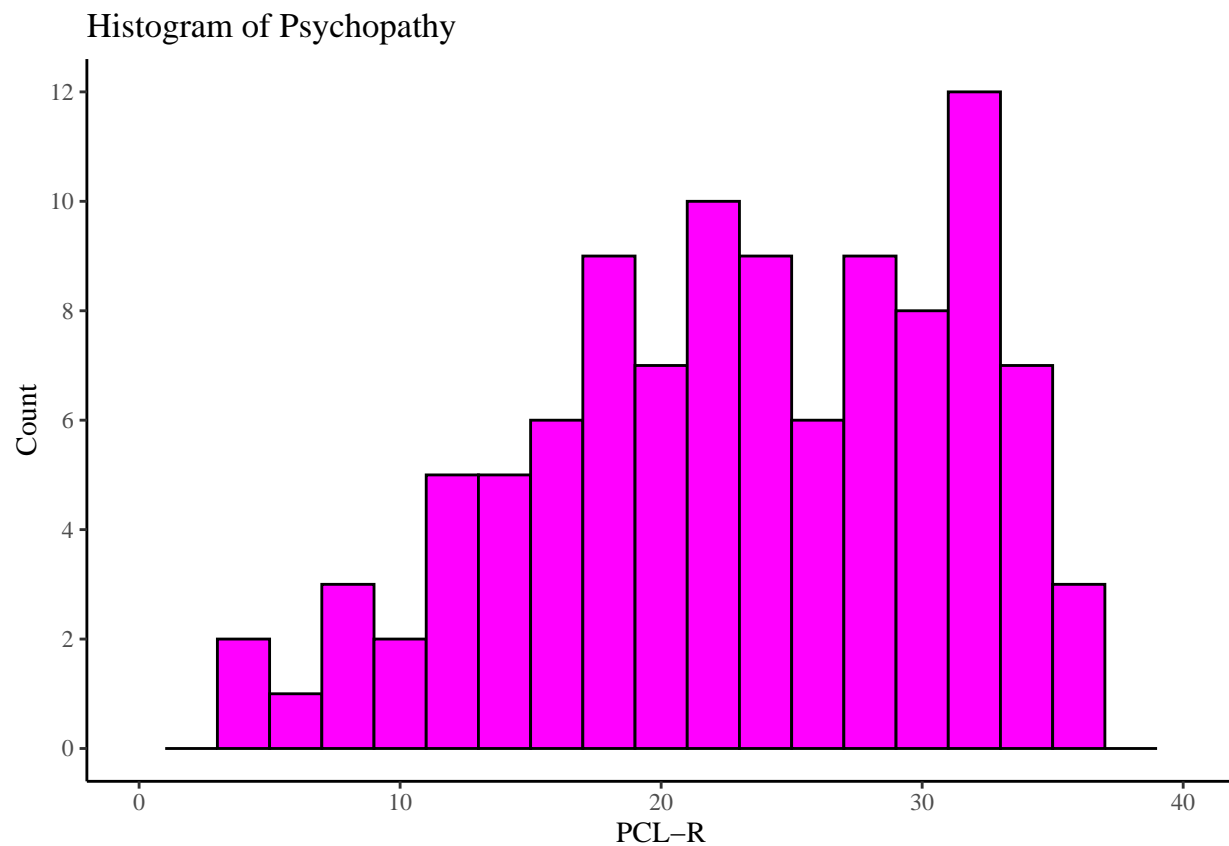
```
## Warning: Removed 2 rows containing missing values (‘geom_bar()’).
```

As seen in Figure 2, our distribution of PCL–R scores is left-skewed, with more participants falling on the higher end of the spectrum. This is ?consistent? with past

Table 1

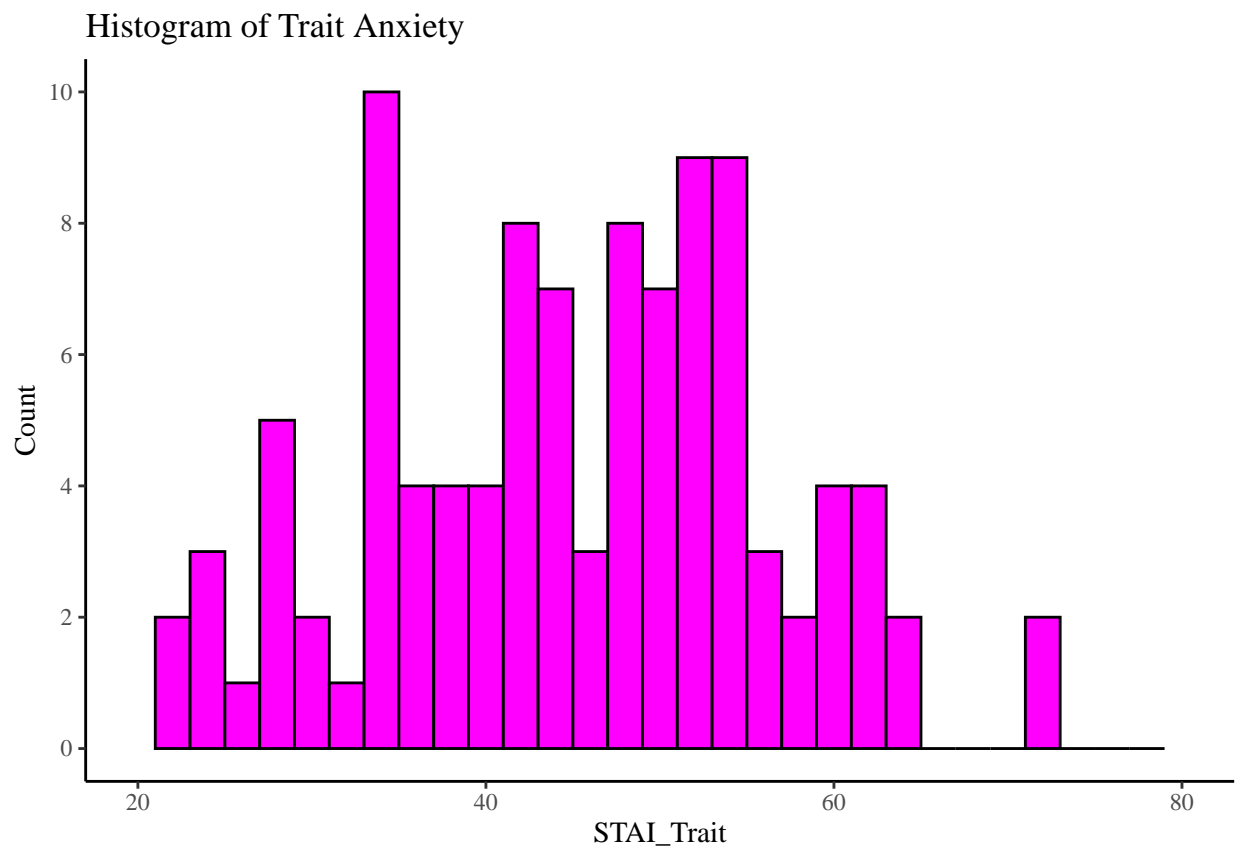
Summary Table

Statistic	N	Mean	St. Dev.	Min	Max
PAIBOR_Total_Score	104	36.750	11.738	11	58
PCLR_Total_Score_Prorated	104	23.476	8.070	4.400	37.000
TAS_Total_Score	104	49.702	13.852	20	82
STAI_Trait_Anxiety	104	45.558	11.213	23	72

*Figure 2.* Histogram of score distribution on the PCL-R.

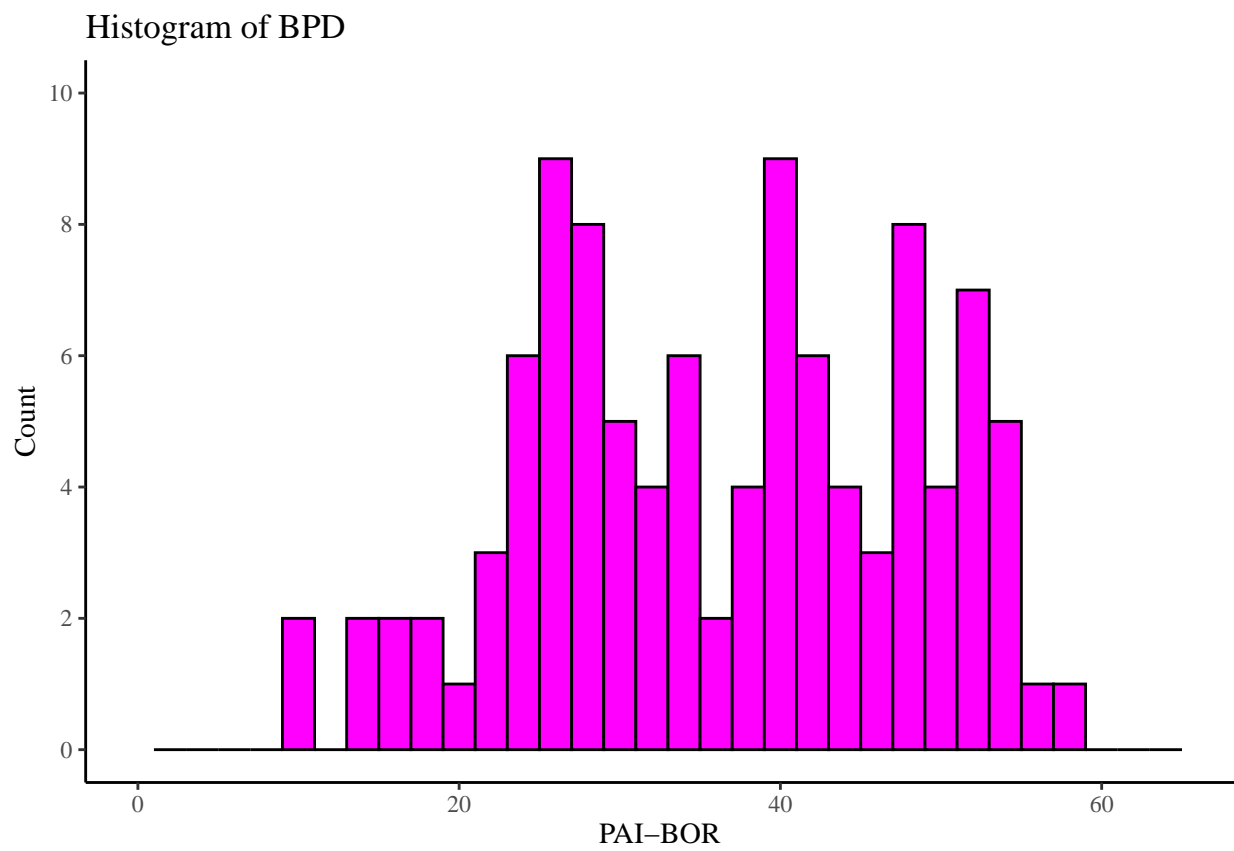
160 studies conducted with incarcerated populations (probably Decety). Other score
161 assessment distributions can be found in the appendix.

162 ## Warning: Removed 2 rows containing missing values ('geom_bar()').



163

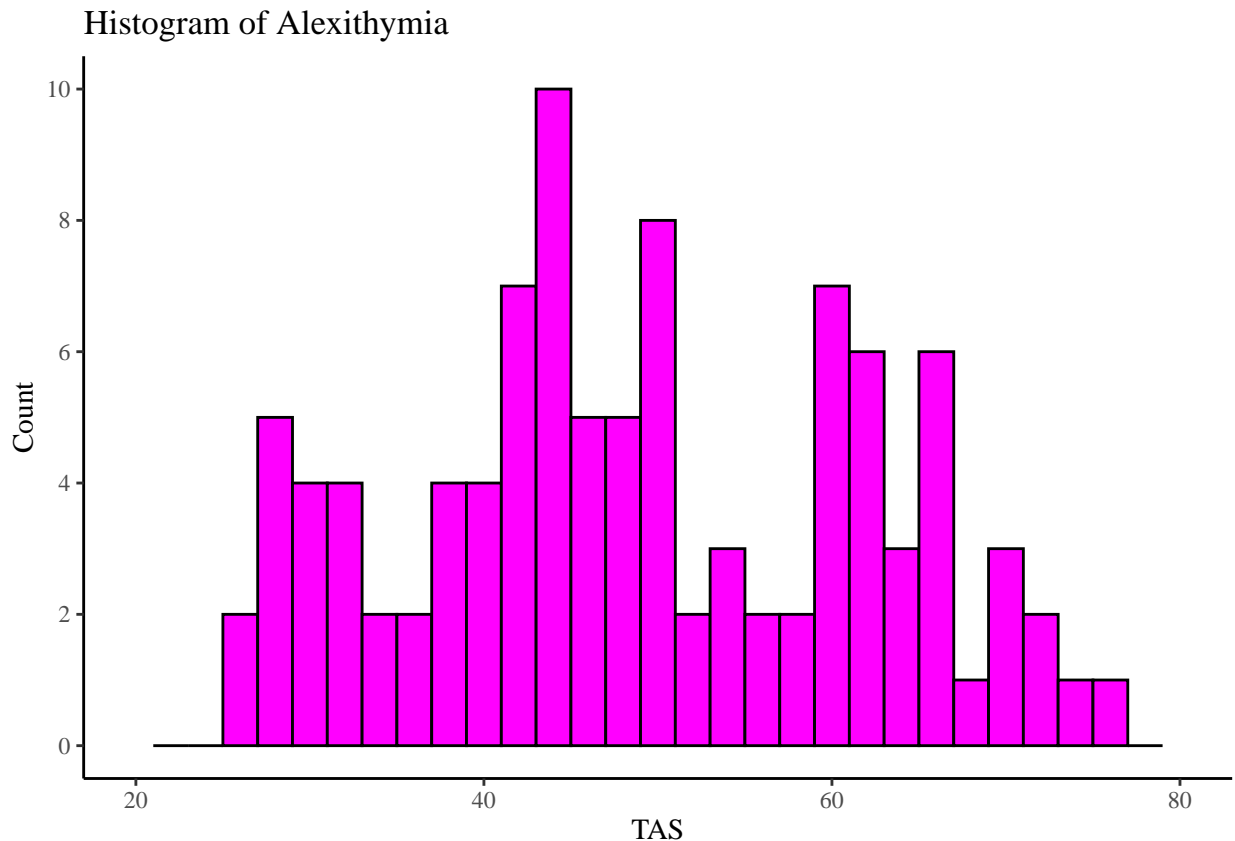
164 ## Warning: Removed 1 rows containing missing values ('geom_bar()').



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166 `## Warning: Removed 1 rows containing non-finite values ('stat_bin()').`

167 `## Warning: Removed 2 rows containing missing values ('geom_bar()').`



168

169 The mean PCL-R score is 23.48.

170 The mean PAI-BOR score is 36.75.

171 The mean TAS score is 49.70.

172 Figure 3 shows a moderate correlation of 0.37 between PsychopathyXAnxiety and
 173 Alexithymia. ...

174 Figure 4 shows a moderate to strong correlation of 0.66 between
 175 PsychopathyXAnxiety and BPD. ...

176 All assessment scores (including the interactive term) were standardized. Mediation
 177 analyses with bootstrapping were conducted to test the primary hypothesis. Unlike other
 178 methods, bootstrapping is not limited by the assumption of normality. The interaction
 179 term of PCL-R Total Score and STAI Trait Anxiety was entered as the predictor, and
 180 PAI-BOR Total Score was entered as the mediating term. Total Score on the TAS was our

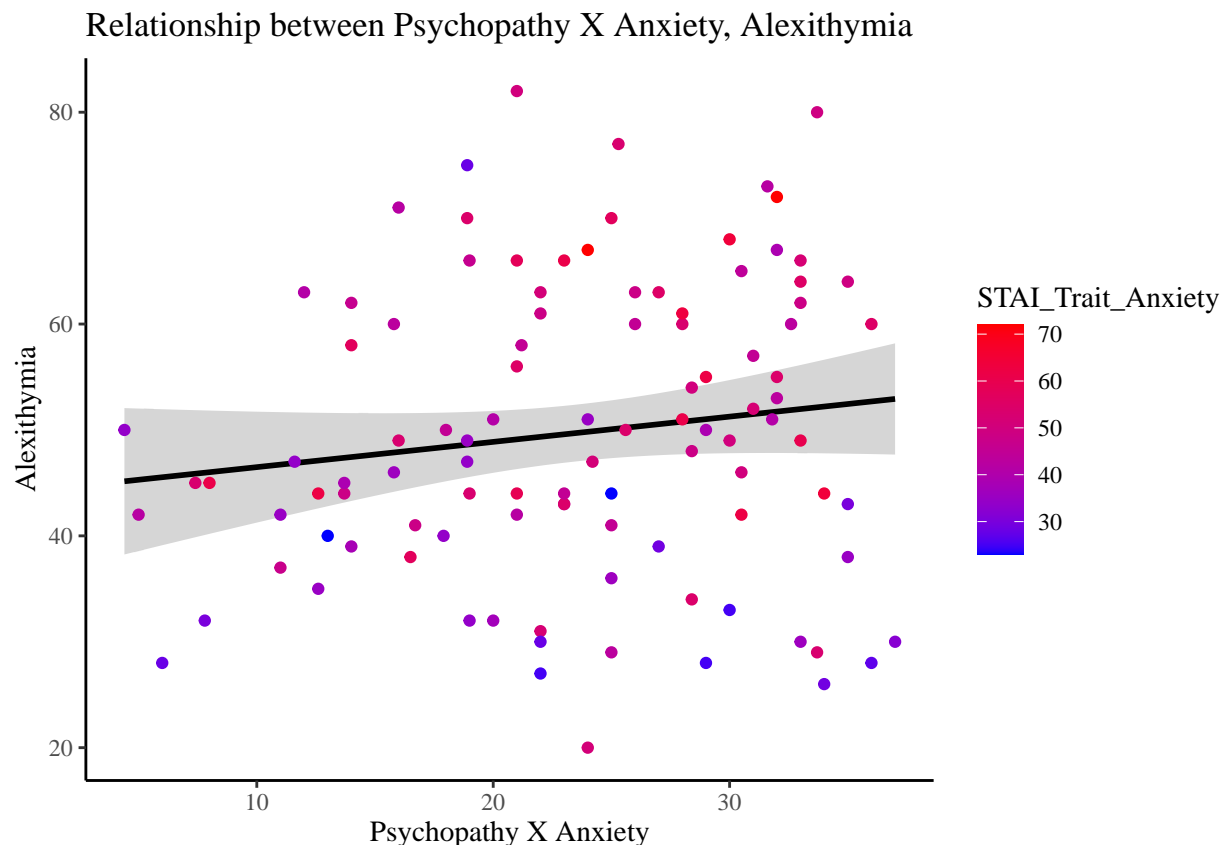


Figure 3. Scatterplot demonstrating relationship between the interactive term of psychopathy and trait anxiety with alexithymia in our sample of incarcerated women.

outcome variable. A significant Average Causal Mediation Effect (ACME) would demonstrate support of our hypothesis. Summary tables (figure out how to include this info) show that the ACME is significant and the Average Direct Effect (ADE) disappears. This implies full causal mediation by BPD on the relationship between PsychopathyXAnxiety and Alexithymia.

In order to run a mediation analysis, one must ensure significant relationships exist between predictor and outcome, predictor and mediator, and mediator and outcome. Results for these preliminary analyses can be seen in Table 2.

There is a significant relationship between predictor and outcome ($p = .$). However, this effect goes away when adding BPD as a mediator ($p = .$). This suggests that the

Table 2

Preliminary Regression Results

	<i>Dependent variable:</i>		
	P-O Path	P-M Path	M-O Path
	(1)	(2)	(3)
PsychopathyXAnxiety	0.373*** (0.092)	0.660*** (0.074)	
BPD			0.471*** (0.087)
Constant	−0.000 (0.091)	−0.000 (0.074)	−0.000 (0.087)
Observations	104	104	104
R ²	0.139	0.436	0.222
Adjusted R ²	0.131	0.431	0.214
Residual Std. Error (df = 102)	0.932	0.755	0.887
F Statistic (df = 1; 102)	16.501***	78.905***	29.024***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 3

Simple Linear Regression Results

	<i>Dependent variable:</i>			
	TAS Total	Factor 1	Factor 2	Factor 3
	(1)	(2)	(3)	(4)
PsychopathyXAnxiety	0.373*** (0.092)	0.418*** (0.090)	0.291*** (0.095)	0.197** (0.097)
Constant	-0.000 (0.091)	-0.000 (0.090)	-0.000 (0.094)	0.000 (0.097)
Observations	104	104	104	104
R ²	0.139	0.174	0.085	0.039
Adjusted R ²	0.131	0.166	0.076	0.030
Residual Std. Error (df = 102)	0.932	0.913	0.961	0.985
F Statistic (df = 1; 102)	16.501***	21.551***	9.463***	4.140**

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 4

Multiple Linear Regression Results

	<i>Dependent variable:</i>			
	TAS Total	Factor 1	Factor 2	Factor 3
	(1)	(2)	(3)	(4)
PsychopathyXAnxiety	0.111 (0.116)	0.096 (0.110)	0.036 (0.121)	0.154 (0.130)
BPD	0.398*** (0.116)	0.487*** (0.110)	0.386*** (0.121)	0.066 (0.130)
Constant	-0.000 (0.087)	-0.000 (0.082)	-0.000 (0.090)	0.000 (0.097)
Observations	104	104	104	104
R ²	0.228	0.308	0.169	0.041
Adjusted R ²	0.213	0.294	0.153	0.022
Residual Std. Error (df = 101)	0.887	0.840	0.921	0.989
F Statistic (df = 2; 101)	14.949***	22.477***	10.273***	2.182

Note:

*p<0.1; **p<0.05; ***p<0.01

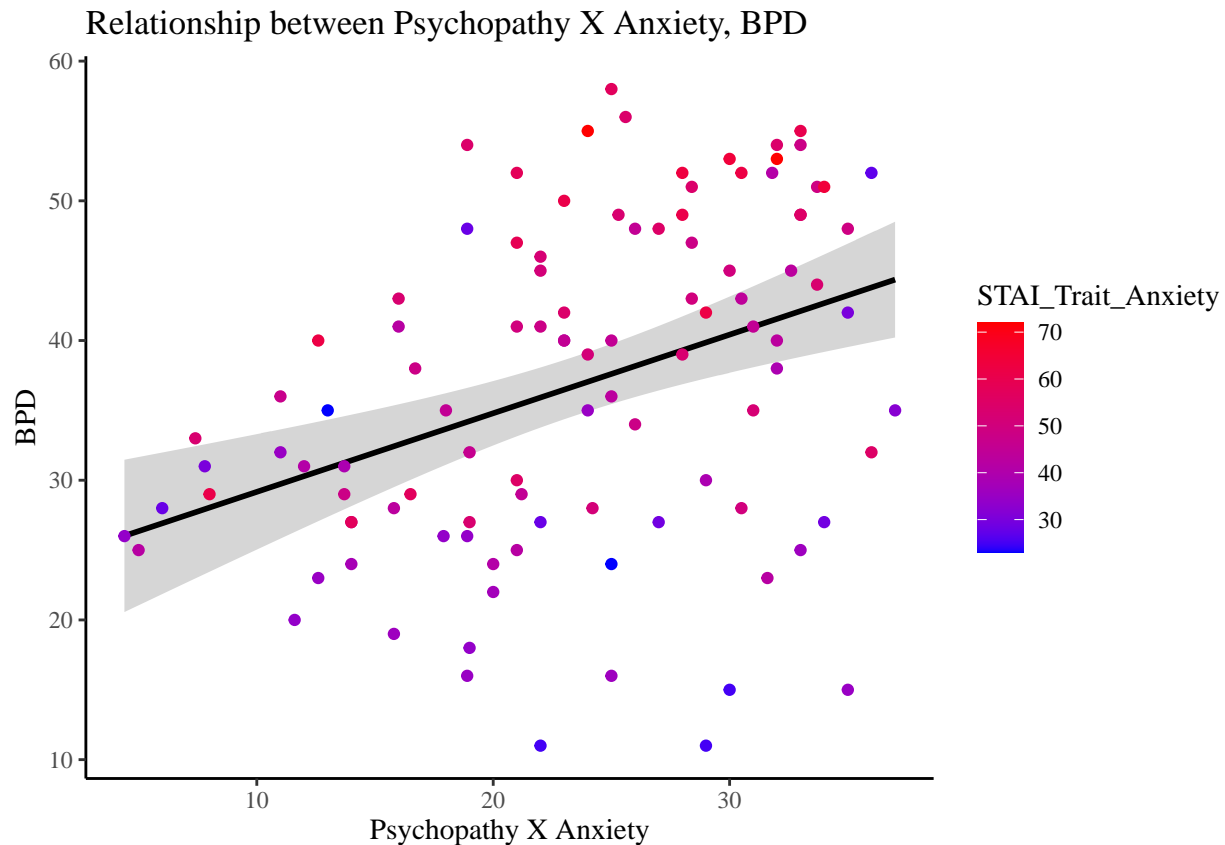


Figure 4. Scatterplot demonstrating relationship between the interactive term of psychopathy and trait anxiety with borderline personality disorder in our sample of incarcerated women.

presence of BPD acts as a mechanism through which the predictor influences the outcome. The significant, full mediation effect we observed suggests that a portion of the total effect of the predictor on the outcome is explained by the mediator ($p =$).

Three subfactors defined in the TAS are believed to compose alexithymia: difficulty identifying feelings (Factor 1), difficulty describing feelings (Factor 2), and externally-oriented thinking (Factor 3). As we collected subfactor scores for every participant, an exploratory analysis could be conducted to get a sense of what specific parts of emotional processing psychopathy and BPD may be impacting. We found that, replacing the total TAS score for Factor 1 and Factor 2, the significant mediation effect

remained in tact. However, designating Factor 3 as an outcome left us with an insignificant model. The change in significant effect when replacing for specific factors of TAS suggests the mediation effect may depend on specific aspects or dimensions of alexithymia. It is critical these results are analyzed with caution as no hypotheses regarding TAS subfactors were determined a priori and the theoretical lineage is at present quite limited.

Discussion

It is possible that BPD symptoms uniquely impact certain dimensions of the outcome variable. When considering what each of the three factors represent, it may be plausible that BPD would affect factors 1 and 2 – addressing emotional comprehension and recognition – and not 3, as BPD may be more closely associated with internalizing features. More research that addresses the role of BPD on externally-oriented thinking is required here to draw firmer conclusions.

It is without a doubt that the relationship between psychopathy, anxiety, BPD, and alexithymia is multifaceted and complex. Our results should be further interpreted with caution and a unique sample such as this one may lead to skewed distributions.

Additional factors and moderators warrant further exploration. Other relevant comorbidities – such as PTSD – may influence the heterogeneous mediation pathway seen here in a way that could explain the nuanced relationships further. Further, it would certainly be worthwhile to break down BPD further to understand what specific mechanisms of this disorder might be at play in this relationship. We did not have sufficient data to conduct a factor analysis, but it may be useful as the personality disorder can be diagnosed in 256 unique ways, according to the DSM-V.

The heterogeneity of this mediation effect is certainly cause for future research. This information can guide the development of targeted interventions or strategies based on specific factors that are most influenced by the mediation process. This changes in

225 significance emphasize the need for careful and nuanced interpretation, taking into account
226 the specific characteristics and dynamics at play for each factor within the composite
227 variables.

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