

Psychopathy, addictions and female gender: Comparative study using the Psychopathy Checklist Revised and the Comprehensive Assessment of Psychopathic Personality

Psicopatía y adicciones en mujeres: Estudio comparativo utilizando el Psychopathy Checklist Revised y el Comprehensive Assessment of Psychopathic Personality

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Abstract

Traditionally, psychopathy research has focused on assessing men with the Psychopathy Checklist Revised (PCL-R). Research on women with other assessment tools is scarce. The objective of this study is to evaluate psychopathy, using various tools, in a sample with both women and men. The study involved 204 inmates (mean age (DS) = 40.93 (11.8)), 28 women (13.7%), in the Pereiro de Aguiar penitentiary (Ourense). Sociodemographic, substance use, and criminal variables were collected, and all were evaluated with the following tools: PCL-R, Comprehensive Assessment of Psychopathic Personality (CAPP), and the International Personality Disorder Examination. In this sample, when assessed with the PCL-R, males obtained significantly higher scores on facet 4, which measures antisocial behaviour. Women obtained significantly higher scores on the Self domain in the CAPP, measuring narcissism. No symptom or item was able to clearly discriminate psychopathic women from psychopathic men in a Support Vector Machine model. The construct of psychopathy is similar for women and men in this representative penitentiary sample. Women showed higher scores for narcissism and men for antisociality. It is better to combine the PCL-R with another tool such as the CAPP to assess these psychopathological differences. No symptom or item has a score that can be recommended as a method for discriminating psychopathic women from psychopathic men.

Keywords: Psychopathy; women; addictions; Psychopathy Checklist Revised; Comprehensive Assessment of Psychopathic Personality.

Resumen

La investigación en psicopatía se ha centrado tradicionalmente en la evaluación de varones con el Psychopathy Checklist Revised (PCL-R). La investigación en mujeres utilizando otros instrumentos de evaluación es muy escasa. El objetivo de este estudio es evaluar la psicopatía, utilizando varios instrumentos, es una muestra que incluya mujeres y varones. 204 internos (edad media (SD) = 40,93 (11,8)), 28 mujeres (13,7%), del Centro Penitenciario de Pereiro de Aguiar (Ourense) participaron en este estudio. Se recogieron variables sociodemográficas, consumo de sustancias, antecedentes delictivos y fueron evaluados con los siguientes instrumentos: PCL-R, Comprehensive Assessment of Psychopathic Personality (CAPP) y el International Personality Disorder Examination. En esta muestra representativa de la población penitenciaria se observó que en el PCL-R los varones obtenían puntuaciones significativamente más elevadas en la faceta 4 que mide la conducta antisocial. Las mujeres obtuvieron puntuaciones significativamente más elevadas en el CAPP en el dominio Self, que mide la conducta narcisista. No se obtuvo ningún síntoma o ítem que permitiese discriminar claramente a las mujeres psicopáticas de los varones psicopáticos utilizando un modelo de Máquinas de Vectores Soporte. El constructo de la psicopatía es similar para las mujeres y los hombres en esta muestra. Las mujeres presentan puntuaciones más elevadas de narcisismo y los varones de antisocialidad. Para valorar mejor estas diferencias psicopatológicas es mejor combinar el PCL-R con otro instrumento como el CAPP. Ningún síntoma o ítem tiene una puntuación que pueda recomendarse como método que permita discriminar a las mujeres psicopáticas de los varones psicopáticos.

Palabras clave: Psicopatía; mujer; adicciones; Psychopathy Checklist Revised; Comprehensive Assessment of Psychopathic Personality.

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Psychopathy, or psychopathic personality disorder, is characterized by the following traits: shallow emotional response and lack of empathy, arrogant and grandiose interpersonal style, and erratic and impulsive behaviour (Blackburn, 2007; Cooke & Logan, 2015). However, there is no symptom/signal, or combination thereof, which is pathognomonic (Cooke & Logan, 2015). Despite the diagnostic difficulties inherent in the diagnosis of psychopathy through semi-structured interviews measuring the presence of certain symptoms or behaviours, numerous studies link psychopathy to a greater presence of antisocial behaviours, committing crimes, especially violent ones, and a greater tendency to recur in such behaviours and crimes (Blair & Lee, 2013; Cale, Lussier, McCuish & Corrado, 2015). This is why its assessment is essential in clinical and forensic settings when establishing follow-ups and treatment plans for patients or inmates involved in antisocial behaviour, in particular after committing violent crimes.

Although most studies on psychopathy have been on men admitted to prisons, there is no a priori reason to think that women cannot also be affected by this disorder. In fact, it is estimated that up to 17.4% of women who commit violent acts have a psychopathic disorder, compared to 31% of men (Carabellese et al., 2019; Gray & Snowden, 2016). It thus appears that this disorder, alongside other externalizing pathologies, is less frequent in women (Rial et al., 2019). On the other hand, numerous authors have shown that differences exist in the way that psychopathy manifests itself in women compared to men (Carabellese et al., 2019; Dolan & Vollm, 2009; Gray & Snowden, 2016; Guay, Knight, Ruscio & Hare, 2018; Thomson, 2017; Verona, Bresin & Patrick, 2013; Wynn, Hoiseth & Pettersen, 2012). Given that the main diagnostic tool for this disorder, the *Psychopathy Checklist Revised* (PCL-R), uses a quantitative cut-off point to determine the presence or absence of this disorder, it is not difficult to establish that men and women reach this cut-off point through qualitatively different symptom patterns; thus, the psychopathy research carried out in men should not be completely extrapolated to women. It needs to be proven through rigorous research. To date, studies indicate that women obtain lower scores on the PCL-R, especially on items related to behaviour disorders, substance use and addictions, and antisocial behaviour. In addition, the predictive power of a psychopathy diagnosis in terms of committing new crimes, especially violent ones, seems to be lower in women compared to men (Carabellese et al., 2019; Dolan & Vollm, 2009; Gray & Snowden, 2016; Guay et al., 2018; Nicholls, Ogloff, Brink & Spidel, 2005; Thomson, 2017; Verona et al., 2013; Wynn et al., 2012).

Furthermore, the PCL-R has been criticized for placing excessive emphasis on criminal behaviour (Blackburn, 2007; Cooke, Michie, Hart & Clark, 2004). This is of great

importance when assessing the presence of psychopathy in women since their crime pattern is different, with less substance use and thus a lower rate of addiction and addiction-related problems. In this pattern, as previously indicated, juvenile delinquency, revocation of probation, antisocial behaviours and violent crimes occur less frequently in women (Carabellese et al., 2019; Dolan & Vollm, 2009; Gray & Snowden, 2016; Guay et al., 2018; Nicholls et al., 2005; Thomson, 2017; Verona et al., 2013; Wynn et al., 2012). Given that all these behaviours influence the PCL-R scores, it is not difficult to understand the problem. Do women have a lower prevalence in terms of psychopathy, with a different symptomatic pattern to men? Or, conversely, is it simply a problem with the assessment instrument and its cut-off points, points that have been questioned given the cultural differences revealed (Cooke & Michie, 1999; Cooke, Michie, Hart & Clark, 2005).

One way to solve this problem is to combine the PCL-R with another assessment instrument that excludes criminal behaviour. The *Comprehensive Assessment of Psychopathic Personality* (CAPP) is the perfect tool for this assessment as it was designed to be able to assess psychopathy without assessing criminality. To date it has proven to be a valid and robust instrument in different international studies (Cooke, Hart, Logan & Michie, 2012; Florez et al., 2015; Sellbom, Cooke & Hart, 2015).

Therefore, to investigate the presence and characteristics of psychopathy in women compared to men, it would be very useful to compare the results of the PCL-R and the CAPP in a representative sample of prison inmates, with similar substance use by both sexes. This, then, is exactly what the present study sets out to test.

Material and methods

The present study was conducted at the Pereiro de Aguiar penitentiary in Ourense. All convicted inmates were offered the opportunity to participate between April 2014 and April 2016. Inclusion criteria were having served at least 6 months of the sentence in the jail and signing informed consent. Exclusion criteria were not being fluent in Spanish and having an organic (involving significant manual, visual or language difficulties) or psychiatric disease (psychotic disorders, affective disorders, anxiety disorders and dementia) that prevented the inmate from participating in the study.

Participation data were as follows: of the 330 inmates evaluated, 204 met the inclusion criteria and took part in the study. The remaining 126 did not meet the criteria for these reasons: 10 did not want to participate, 16 did not speak fluent Spanish, 32 had an organic or psychiatric illness that prevented them from participating, and 68 (53.99%) inmates had not yet served at least 6 months of their sentence in the jail. Of the 126, 11 (8.73%) were

women and the rest, 115 (91.27%), were men. The final sample is representative of the penitentiary population.

The ratio among the participants of 176 men to 28 women is quite normal given the proportion in Spanish penitentiaries of 12 men to every woman (Vicens et al., 2011).

The research was approved by the Ethics Committee of Vigo - Ourense - Pontevedra (2014/009). The study was performed according to the Declaration of Helsinki (World Medical, 2013).

All participants were assessed using the following protocol:

- *International Personality Disorder Examination* (IPDE) DSM IV version (Lenzenweger, Lane, Loranger & Kessler, 2007): Semi-structured interview aimed at diagnosing categorical personality disorders (PD) following the DSM IV model.
- *Psychopathy Checklist Revised* (PCL-R) (Hare, Clark, Grann & Thornton, 2000): This is the gold-standard instrument in the field of psychopathy assessment. Semi-structured interview, supported by the information available in the history and that provided by informants who know the subject, to measure psychopathy across the lifespan through 20 symptoms. Each symptom is scored from 0 to 2. Its use is adapted to the forensic and prison environment. Symptoms are usually grouped into a 2-factor, 4-facet structural model: factor 1, interpersonal and affective [interpersonal (facet 1), affective (facet 2)] and factor 2, social deviation [lifestyle (facet 3), antisocial behaviour (facet 4)].
- *Comprehensive Assessment of Psychopathic Personality* (CAPP) (Kreis, Cooke, Michie, Hoff & Logan, 2012): Semi-structured interview which, unlike the PCL-R, does not score crime. It assesses 33 symptoms, scored from 1 to 7, and structured in 6 dimensions: attachment, behavioural, cognitive, dominance, emotional, and self. Symptoms are assessed over a 6- to 12-month period. In addition to the interview, all available information is collected using the history and informants who have known the inmate for at least 6 months.
- "Ad hoc" protocol of sociodemographic variables and those relating to substance use and prison: gender, age, nationality, years of education completed, marital status, total jail time in months, type and number of crimes committed, type, age of onset and lifetime consumption and number of addictive substances other than nicotine, including those prescribed as treatment (methadone, buprenorphine, benzodiazepines), separating alcohol use from alcohol abuse.

G. Flórez assessed all the participants using IPDE, PCL-R and CAPP in a blinded fashion with regard to the results of the sociodemographic and prison variables.

Data analysis

All statistical analysis was performed using R software, version 3.4.3. A correlation matrix was computed with the total PCL-R scores, its factors and facets, and with the total scores and the CAPP domains. It covered the entire sample and was calculated separately for women and men.

Study variables are described by means and standard deviations for continuous variables, and by number of occurrences and percentages for categorical variables. With continuous variables, the Mann-Whitney test was used when comparing two non-normally distributed groups. For categorical variables, comparisons were made using the Chi-square test, or Fisher's exact test in those cases where the theoretical frequencies were lower than 5. The Pearson correlation coefficient was used as a method for measuring the strength of linear association between continuous variables and multiple linear and logistic regression models in order to detect possible multivariate relationships. The logistic regression models used gender as the dependent variable. The goodness of fit of the models obtained was verified using the Hosmer and Lemeshow test. The presence of multicollinearity problems between predictors was ruled out before inclusion in the logistic regression models.

Finally, a support vector machines model was applied with the aim of creating, in a computationally efficient way, hyperplanes capable of performing separations in spaces characterised by a large number of dimensions. We applied this model with the aim of determining whether it is possible to differentiate between men and women based on results obtained with the CAPP and PCL-R instruments. In those cases where the data are not linearly separable, a problem posed by this sample, they can be cast into a higher-dimensional space where it is possible to make a linear separation. Another possible strategy is to accept that there will be data that cannot be correctly classified and to try to correctly classify the greatest amount of information by minimizing its loss function. A combination of both techniques was used in this study.

A value of $p < 0.05$ was considered significant.

Results

Table 1 shows the distribution of variables and the prevalence of PD according to the IPDE by gender.

It can be seen in Table 1 that both groups were similar, since statistically significant differences were only found in the following variables: the men had spent more time in jails, had consumed and abused more alcohol, so they had a higher percentage of convictions for driving under the influence of alcohol, and had also used more cannabis; men had received more diagnoses of antisocial personality disorder (APD), while women had been diagnosed with the following PDs more often: borderline, narcissistic, histrionic, and dependent.

Table 1. Sociodemographic and prison variables of the sample, together with prevalence of Personality Disorders according to IPDE, by gender.

| Variables | Women (28) | | Men (176) | | p | |
|---|---------------|---------|---------------|---------|---------------------------------|----------|
| Age [mean (SD)] | 40.89 (11.16) | | 40.97 (11.20) | | t=0.03 | p=0.97 |
| Nationality | | | | | | |
| Spanish | 22 | 78.57% | 157 | 89.20% | X ² =1.64 p=0.199 | |
| Other | 6 | 21.43% | 19 | 10.80% | | |
| Education: years completed [median, (SD)] | | | | | | |
| Lower | 8.75 | (2.15) | 8.84 | (1.95) | t=0.20 | p=0.84 |
| Higher | 0.21 | (0.69) | 0.24 | (0.88) | t=0.17 | p=0.86 |
| Marital status | | | | | | |
| Married | 5 | 17.86% | 28 | 15.91% | X ² =0.067 p=0.79 | |
| Remarried | 2 | 7.14% | 14 | 7.95% | | |
| Widow(er) | 1 | 3.57% | 0 | 0.00% | X ² =3.83 p=0.05 | p=0.1373 |
| Separated | 6 | 21.43% | 17 | 9.66% | | |
| Divorced | 5 | 17.86% | 33 | 18.75% | X ² =0.01 | p=0.91 |
| Single | 9 | 32.14% | 84 | 47.73% | X ² =2.36 | p=0.12 |
| Total months in jail [mean (SD)] | 45.61 | (43.27) | 79.77 | (87.46) | t=3.25 | p<0.01 |

Note. SD: Standard deviation; IPDE: International Personality Disorder Examination.

Table 2. Correlation matrix for PCL-R (total, factors and facets) and CAPP (total and domains) for the total sample, women (bold) and men (italics).

| | PCLR total | PCLR F1 | PCLR F2 | PCLR f1 | PCLR f2 | PCLR f3 | PCLR f4 | CAPP A | CAPP B | CAPP C | CAPP D | CAPP E | CAPP S | CAPP total |
|-------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------|
| PCLR total | 1.00 | | | | | | | | | | | | | |
| PCLR F1 | 0.83 0.69 0.85 | 1.00 | | | | | | | | | | | | |
| PCLR F2 | 0.86 0.78 0.88 | 0.46 0.11 0.53 | 1.00 | | | | | | | | | | | |
| PCLR f1 | 0.76 0.70 0.77 | 0.90 0.94 0.89 | 0.43 0.17 0.49 | 1.00 | | | | | | | | | | |
| PCLR f2 | 0.73 0.58 0.74 | 0.89 0.93 0.89 | 0.39 0.02 0.55 | 0.59 0.75 0.58 | 1.00 | | | | | | | | | |
| PCLR f3 | 0.83 0.84 0.83 | 0.47 0.26 0.51 | 0.93 0.95 0.93 | 0.47 0.32 0.50 | 0.37 0.16 0.40 | 1.00 | | | | | | | | |
| PCLR f4 | 0.72 0.50 0.76 | 0.36 0.17 0.44 | 0.88 0.86 0.89 | 0.29 0.12 0.37 | 0.35 0.20 0.42 | 0.64 0.66 0.65 | 1.00 | | | | | | | |
| CAPP A | 0.60 0.57 0.60 | 0.64 0.65 0.64 | 0.41 0.27 0.44 | 0.45 0.48 0.44 | 0.70 0.75 0.69 | 0.33 0.26 0.34 | 0.43 0.22 0.47 | 1.00 | | | | | | |
| CAPP B | 0.62 0.51 0.63 | 0.41 0.05 0.45 | 0.65 0.68 0.66 | 0.37 0.04 0.41 | 0.36 0.05 0.40 | 0.60 0.63 0.60 | 0.57 0.60 0.59 | 0.55 0.32 0.57 | 1.00 | | | | | |
| CAPP C | 0.58 0.39 0.61 | 0.49 0.22 0.51 | 0.52 0.41 0.55 | 0.37 0.21 0.39 | 0.50 0.21 0.53 | 0.46 0.41 0.48 | 0.48 0.32 0.52 | 0.70 0.29 0.74 | 0.75 0.70 0.75 | 1.00 | | | | |
| CAPP D | 0.68 0.33 0.72 | 0.72 0.64 0.74 | 0.46 0.03 0.54 | 0.62 0.57 0.62 | 0.67 0.63 0.68 | 0.41 0.004 0.47 | 0.42 0.14 0.51 | 0.80 0.56 0.82 | 0.63 0.30 0.65 | 0.78 0.33 0.81 | 1.00 | | | |
| CAPP E | 0.64 0.26 0.68 | 0.61 0.43 0.63 | 0.50 0.05 0.57 | 0.43 0.32 0.44 | 0.65 0.49 0.67 | 0.43 0.11 0.49 | 0.48 0.07 0.55 | 0.79 0.52 0.82 | 0.61 0.36 0.63 | 0.78 0.25 0.80 | 0.91 0.75 0.92 | 1.00 | | |
| CAPP S | 0.62 0.48 0.65 | 0.67 0.70 0.67 | 0.41 0.13 0.48 | 0.64 0.66 0.64 | 0.55 0.66 0.55 | 0.37 0.20 0.41 | 0.37 0.01 0.47 | 0.68 0.60 0.70 | 0.59 0.21 0.63 | 0.67 0.23 0.70 | 0.84 0.72 0.85 | 0.73 0.43 0.75 | 1.00 | |
| CAPP total | 0.71 0.59 0.74 | 0.69 0.64 0.70 | 0.55 0.33 0.61 | 0.57 0.55 0.58 | 0.65 0.65 0.66 | 0.49 0.37 0.53 | 0.51 0.20 0.58 | 0.84 0.74 0.86 | 0.78 0.64 0.80 | 0.87 0.61 0.89 | 0.96 0.86 0.96 | 0.91 0.72 0.92 | 0.88 0.78 0.89 | 1.00 |

Note. PCLR: Psychopathy Checklist Revised; PCLR: F1: factor 1; F2: factor 2; f1: facet 1 (interpersonal); f2: facet 2 (affective); f3: facet 3 (lifestyle); f4: facet 4 (antisocial behaviour); CAPP: Comprehensive Assessment of Psychopathic Personality CAPP: A: attachment; B: behavioural; C: cognitive; D: dominance; E: emotional; S: Self. Underlined: negative score.

The correlation matrix (Table 2) should be analyzed from the perspective of the patterns arising in each group when comparing the results, rather than from the point of view of mere scores; since the group of women is much smaller their scores are lower due to a range restriction effect. This table shows how the correlation patterns of the total sample are maintained when the sample is separated

into men and women. While the PCL-R facets making up the factors correlate strongly with each other (facets 1 and 2, versus 3 and 4), the correlation with the facets of the other factor is weak. In women, the high correlation between facets 1 and 2 stands out. As expected, facet 1 (interpersonal) achieves the best correlation scores with the CAPP domains of Dominance and Self, and its weakest correlations

Table 3. *Univariate comparison between women and men on CAPP items, including domains and total score.*

| | Women mean (SD) | Men mean (SD) | F | P |
|--|-----------------|---------------|-------|-------------|
| Attachment 18 detached | 2.89 (1.61) | 2.61 (1.77) | 0.61 | 0.43 |
| Attachment 8 uncommitted | 3.14 (1.55) | 2.56 (1.59) | 3.17 | 0.01 |
| Attachment 25 unempathic | 2.03 (1.66) | 2.00 (1.72) | 0.01 | 0.93 |
| Attachment 24 uncaring | 2.17 (1.56) | 2.26 (1.66) | 0.06 | 0.80 |
| Behavioural 3 lacks perseverance | 1.75 (1.64) | 1.88 (1.85) | 0.12 | 0.72 |
| Behavioural 26 unreliable | 2.57 (1.55) | 2.32 (1.87) | 0.44 | 0.50 |
| Behavioural 15 reckless | 2.71 (1.58) | 2.51 (1.70) | 0.35 | 0.55 |
| Behavioural 6 restless | 2.60 (1.39) | 2.02 (1.75) | 2.75 | 0.09 |
| Behavioural 17 disruptive | 2.32 (1.44) | 1.87 (1.65) | 1.82 | 0.17 |
| Behavioural 32 aggressive | 1.57 (1.20) | 1.61 (1.59) | 0.02 | 0.89 |
| Cognitive 19 suspicious | 3.60 (1.59) | 3.11 (1.77) | 1.92 | 0.16 |
| Cognitive 28 lacks concentration | 1.75 (1.71) | 1.34 (1.60) | 1.51 | 0.22 |
| Cognitive 7 intolerant | 1.85 (1.38) | 1.40 (1.55) | 2.13 | 0.14 |
| Cognitive 27 inflexible | 2.17 (1.67) | 1.97 (1.51) | 0.44 | 0.51 |
| Cognitive 29 lacks planfulness | 2.57 (1.79) | 2.07 (1.92) | 1.64 | 0.20 |
| Dominance 11 antagonistic | 1.32 (1.15) | 1.26 (1.44) | 0.04 | 0.83 |
| Dominance 12 domineering | 2.14 (1.75) | 1.69 (1.63) | 1.75 | 0.18 |
| Dominance 10 deceitful | 2.89 (1.52) | 2.44 (1.71) | 1.72 | 0.19 |
| Dominance 9 manipulative | 3.14 (1.64) | 2.55 (1.63) | 3.16 | 0.07 |
| Dominance 23 insincere | 3.35 (1.33) | 2.68 (1.67) | 4.15 | 0.04 |
| Dominance 30 garrulous | 2.71 (1.65) | 2.01 (1.58) | 4.69 | 0.03 |
| Emotional 5 lacks anxiety | 3.42 (1.39) | 2.67 (1.63) | 5.3 | 0.02 |
| Emotional 33 lacks pleasure | 1.39 (1.06) | 1.59 (1.61) | 0.42 | 0.51 |
| Emotional 4 lacks emotional depth | 1.53 (1.29) | 1.86 (1.72) | 0.92 | 0.33 |
| Emotional 31 lacks emotional stability | 3.10 (1.25) | 1.90 (1.74) | 12.22 | 0.01 |
| Emotional 16 lacks remorse | 4.17 (1.27) | 3.31 (1.69) | 6.68 | 0.01 |
| Self 20 self-centred | 3.64 (1.63) | 2.76 (1.99) | 4.85 | 0.02 |
| Self 14 self-aggrandising | 2.53 (1.77) | 1.79 (1.73) | 4.36 | 0.03 |
| Self 1 sense of uniqueness | 3.03 (1.79) | 2.22 (1.84) | 4.72 | 0.03 |
| Self 13 sense of entitlement | 2.67 (1.72) | 2.02 (1.66) | 3.64 | 0.05 |
| Self 22 sense of invulnerability | 3.10 (1.66) | 1.78 (1.67) | 15.08 | 0.01 |
| Self 2 self-justifying | 3.89 (1.47) | 3.29 (1.64) | 3.29 | 0.07 |
| Self 21 unstable self concept | 2.00 (1.74) | 1.18 (1.60) | 6.02 | 0.01 |
| CAPP Attachment | 10.25 (5.22) | 9.44 (5.87) | 0.46 | 0.49 |
| CAPP Behavioural | 13.54 (6.75) | 12.23 (8.50) | 0.6 | 0.44 |
| CAPP Cognitive | 11.96 (4.19) | 9.90 (5.99) | 3.05 | 0.08 |
| CAPP Dominance | 29.21 (8.56) | 24.00 (13.07) | 4.15 | 0.04 |
| CAPP Emotional | 13.64 (2.88) | 11.35 (6.22) | 3.64 | 0.05 |
| CAPP Self | 20.89 (7.21) | 15.08 (9.26) | 10.03 | 0.01 |
| CAPP total | 99.50 (25.80) | 82.03 (43.62) | 4.24 | 0.04 |

Note. CAPP: Comprehensive Assessment of Psychopathic Personality. Bold: statistically significant results; SD: Standard deviation.

are with Behavioural and Cognitive for both groups. With regard to facet 2 (affective), and also for both groups, the scores indicate a better correlation with Attachment, Dominance, Emotional and Self, and the lowest was again with Behavioural and Cognitive. In this group of correlations, the relationship in the group of women between facet 2 of the PCL-R and the Attachment and Self domains of the CAPP stands out. For facet 3 (lifestyle), a strong correlation with the Behavioural dimension is observed in both groups, another somewhat less intense with Cognitive, and weak correlations with the rest of the CAPP dimensions. The same pattern is observed for facet 4 (antisocial behaviour). With regard to the CAPP dimensions, Attachment correlates strongly in both groups with Dominance, Emotional and Self. Behavioural and Cognitive correlate well with each other in both groups, and in men, but not in women, they correlate well with the other dimensions. Dominance stands out as the fundamental dimension for understanding the concept of CAPP psychopathy; it is the central dimension, the one that best correlates with all the

others in both groups. While Emotional and Self correlate well in men with all dimensions, their correlations in women with Behavioural and Cognitive lose potency.

Table 3 shows that at the level of univariate analysis, significant differences between men and women in the CAPP are fundamentally found in the dimensions of Dominance (total score and items 23 and 30), Emotional (items 5, 31 and 16), and especially Self (total score and items 20, 14, 1, 22, 2 and 21). A significant difference was also found in item 8, Attachment. All these significant differences indicate higher scores for women.

Table 4 indicates that the significant differences between men and women in the PCL-R at the level of univariate analysis are fundamentally found in impulsivity (items 10 and 11) and antisocial behaviour (facet 4); the scores in this case are significantly higher for men. Women scored significantly higher on one item, 17, which measures short-term marital relationships.

Overall, at the level of univariate analysis, the CAPP is seen to have greater capacity to distinguish between wom-

Table 4. Univariate comparison between women and men on PCL-R items, including factors, facets, and total score.

| | Women mean (SD) | Men mean (SD) | F | P |
|--|-----------------|---------------|------|-------------|
| PCL-R 1 glibness / superficial charm | 1.00 (0.98) | 0.71 (0.86) | 2.59 | 0.10 |
| PCL-R 2 grandiose sense of self-worth | 0.92 (0.90) | 0.73 (0.90) | 1.06 | 0.30 |
| PCL-R 3 needs stimulation / easily bored | 1.21 (0.95) | 1.31 (0.92) | 0.30 | 0.58 |
| PCL-R 4 pathological lying | 0.92 (0.94) | 0.86 (0.94) | 0.10 | 0.75 |
| PCL-R 5 deceitful / manipulative | 1.53 (0.69) | 1.47 (0.83) | 0.15 | 0.70 |
| PCL-R 6 lacks sense of remorse or guilt | 1.67 (0.72) | 1.57 (0.75) | 0.47 | 0.49 |
| PCL-R 7 shallow affect | 0.60 (0.83) | 0.72 (0.89) | 0.45 | 0.50 |
| PCL-R 8 callous / lacks empathy | 0.75 (0.88) | 0.86 (0.89) | 0.39 | 0.53 |
| PCL-R 9 parasitic lifestyle | 1.21 (0.95) | 0.97 (0.94) | 1.50 | 0.22 |
| PCL-R 10 poor behavioural self-control | 1.28 (0.89) | 1.66 (0.68) | 6.68 | 0.01 |
| PCL-R 11 sexual promiscuity | 0.92 (1.01) | 0.73 (0.94) | 1.01 | 0.31 |
| PCL-R 12 behavioural problems in childhood | 0.60 (0.91) | 0.64 (0.91) | 0.04 | 0.85 |
| PCL-R 13 lacks realistic long-term goals | 0.96 (0.99) | 0.92 (0.97) | 0.04 | 0.84 |
| PCL-R 14 impulsiveness | 1.32 (0.83) | 1.68 (0.65) | 6.58 | 0.01 |
| PCL-R 15 irresponsibility | 1.60 (0.73) | 1.72 (0.64) | 0.73 | 0.39 |
| PCL-R 16 unable to take responsibility for actions | 1.82 (0.47) | 1.58 (0.75) | 2.60 | 0.10 |
| PCL-R 17 frequent short-term marital relationships | 0.53 (0.88) | 0.22 (0.56) | 6.23 | 0.01 |
| PCL-R 18 juvenile delinquency | 0.10 (0.41) | 0.37 (0.75) | 3.37 | 0.06 |
| PCL-R 19 revocation of parole | 0.28 (0.71) | 0.54 (0.87) | 2.23 | 0.13 |
| PCL-R 20 criminal versatility | 0.10 (0.41) | 0.32 (0.71) | 2.46 | 0.11 |
| factor 1 | 9.25 (4.55) | 8.54 (4.65) | 0.57 | 0.45 |
| factor 2 | 8.71 (5.24) | 10.17 (5.05) | 2 | 0.15 |
| facet 1 interpersonal | 4.39 (2.60) | 3.79 (2.64) | 1.26 | 0.26 |
| facet 2 affective | 4.85 (2.27) | 4.75 (2.59) | 0.04 | 0.83 |
| facet 3 lifestyle | 6.32 (3.58) | 6.62 (3.08) | 0.22 | 0.63 |
| facet 4 antisocial behaviour | 2.39 (2.14) | 3.55 (2.46) | 5.51 | 0.02 |
| Total | 19.32 (8.38) | 19.60 (9.07) | 0.02 | 0.87 |

Note. SD: Standard deviation; PCL-R: Psychopathy Checklist Revised. Bold: statistically significant results.

en and men compared to the PCL-R. This is already evident in the total scores, where the CAPP shows a significant difference in favour of women that does not exist in the PCL-R.

Eleven women (39.28%) scored 25 or more in the PCL-R, exceeding the European cut-off point, compared to 69 men (39.20%). The univariate comparison in this group of inmates yielded the following significant differences in favour of men, with the exception of item 17: poor behavioural self-control (item 10) ($W = 436.5$, $p = 0.036$), irresponsibility (item 14) ($W = 465$, $p < 0.01$), frequent short-term marital relationships (item 17) ($W = 226.5$, $p = 0.01$), juvenile delinquency (item 18) ($W = 507.5$, $p = 0.037$), revocation of probation (item 19) ($W = 508.5$, $p = 0.03$), factor 2 ($W = 541$, $p = 0.02$), facet 4 ($W = 554$, $p = 0.01$); and in the CAPP: no emotional depth (emotional 4) ($W = 549$, $p = 0.01$), higher for women in this case.

The results of the logistic regression are presented in Table 5. This table shows that only the variables PCL-R facet 4 and CAPP Self are statistically significant, while the variables CAPP Dominance and CAPP Emotional present p values below 0.25. The result yielded by the Homer and Lemeshow test of the goodness-of-fit of the proposed model shows that the obtained model fits reality.

Table 5. Logistic regression with sex of the individual as dependent variable, using PCL-R facets and the CAPP domains.

| Variables | B | SE | OR (IC 95%) | gl | p |
|------------------|-------|------|-------------------|----|-----------------|
| PCLR-Facet 1 | -0.01 | 0.15 | 0.99 (0.74; 1.34) | 1 | 0.98 |
| PCLR-Facet 2 | 0.11 | 0.15 | 1.12 (0.82; 1.52) | 1 | 0.45 |
| PCLR-Facet 3 | -0.03 | 0.11 | 0.96 (0.77; 1.19) | 1 | 0.72 |
| PCLR-Facet 4 | 0.53 | 0.16 | 1.69 (1.22; 2.35) | 1 | <0.01 |
| CAPP-Attachment | 0.06 | 0.07 | 1.06 (0.92; 1.22) | 1 | 0.35 |
| CAPP-Behavioural | -0.02 | 0.04 | 0.97 (0.88; 1.07) | 1 | 0.61 |
| CAPP-Cognitive | -0.05 | 0.07 | 0.94 (0.81; 1.09) | 1 | 0.42 |
| CAPP-Dominance | 0.07 | 0.06 | 1.08 (0.94; 1.23) | 1 | 0.24 |
| CAPP-Emotional | -0.10 | 0.08 | 0.90 (0.75; 1.07) | 1 | 0.24 |
| CAPP-Self | -0.12 | 0.04 | 0.87 (0.79; 0.96) | 1 | <0.01 |

Note. PCLR: Psychopathy Checklist Revised; CAPP: Comprehensive Assessment of Psychopathic Personality; SE: Standard error; OR: Odds Ratio; CI: Confidence interval; df: Degrees of freedom.

Table 6 presents the results obtained from the repetition of the logistic regression model using as variables only PCL-R facet 4, CAPP Dominance, CAPP Emotional and CAPP Self, i.e., the variables that with p values below 0.25 in the original model. From the results obtained, it can be clearly observed how only the two variables identified as such in the first model continue to be significant. The Homer and Lemeshow test result also allows us to affirm that the model conforms to reality.

Table 6. Logistic regression model including the PCL-R and CAPP variables obtaining p -values below 0.2 in the global model.

| Variables | B | SE | OR (IC 95%) | gl | p-value |
|----------------|-------|------|-------------------|----|-----------------|
| PCLR-Facet 4 | 0.42 | 0.12 | 1.52 (1.20; 1.93) | 1 | <0.01 |
| CAPP-Dominance | 0.08 | 0.05 | 1.09 (0.97; 1.22) | 1 | 0.11 |
| CAPP-Emotional | -0.08 | 0.06 | 0.91 (0.80; 1.04) | 1 | 0.18 |
| CAPP-Self | -0.12 | 0.04 | 0.87 (0.80; 0.95) | 1 | <0.01 |

Note. PCLR: Psychopathy Checklist Revised; CAPP: Comprehensive Assessment of Psychopathic Personality; SE: Standard error; OR: Odds Ratio; CI: Confidence interval; df: Degrees of freedom.

To discover whether it is possible to differentiate between men and women based on the results obtained in the CAPP and PCL-R tests, models based on Support Vector Machines were subsequently applied. Firstly, a model was formed using the data corresponding to all the available individuals as information for its training, with all CAPP and PCL-R variables as input variables, and sex as output variables. The model obtained specificity and sensitivity values of 100%.

However, this result does not show that the Support Vector Machines model has any predictive capacity, simply that it is capable of correctly classifying the entire data set once 100% of the information is known. To reveal the predictive capacity of the model, and therefore to know whether it is possible to discriminate between men and women from the results in the CAPP and PCL-R tests, the data set is divided randomly into training and validation samples. Each of the training samples is made up of 66.66% of the available information, and the validation samples comprise the remaining 33.34%. Thus, of the total of 204 individuals who underwent both the CAPP and the PCL-R tests, 117 men and 20 women were random-

ly chosen for each training set. For each of the available kernels, the training and validation process was repeated 10,000 times. In the case of the linear kernel, the mean value obtained for sensitivity was 0% and 50% for specificity; for the polynomial kernel of grade 7 (the best of all grades), the sensitivity value was 22.22 % and specificity 35.59%; for the sigmoidal kernel the sensitivity value was 0% and specificity 47.46%, while, finally, for the radial kernel, the mean sensitivity value was 0% and specificity 50%. The confusion matrix for the grade 7 polynomial kernel indicated the following degrees of real prediction: Men - Men [44.45 (44.37 - 44.52)], Men - Women [6.35 (6.32 - 6.38)], Women - Men [14.55 (14.47; 14.62)] and Women - Women [2.64 (2.61, 2.67)].

These results indicate that, based on the CAPP and PCL-R variables, it is very difficult for the Support Vector Machine model to distinguish women, a minority group, from men in this sample.

Discussion

The social and demographic variables analyzed indicate that neither group, women or men, presents significant differences that could function as confounding variables for the subsequent analysis. The differences regarding the consumption of toxins are balanced. The use of alcohol and cannabis, greater in men, is very common throughout the sample. In this sample, alcohol is linked only weakly to antisocial behaviours and psychopathy, whereas the opposite is true of cannabis. Moreover, there are no significant differences with respect to the substances most linked to criminal behaviour, morphic derivatives and stimulants such as cocaine and amphetamines. Finally, the difference between women and men in terms of PD has been already described in previous studies (Carabellese et al., 2019; Dolan & Vollm, 2009; Gray & Snowden, 2016; Guay et al., 2018; Nicholls et al., 2005; Thomson, 2017; Verona et al., 2013; Wynn et al., 2012). Men present a higher incidence of APD, the PD most related to criminal behaviour, while women presented a higher incidence of disorders related to the absence of empathy and to arrogant and grandiose interpersonal styles, that is, narcissistic, borderline, and histrionic. Dependent PD, also more prevalent in women, is not very frequent in the sample. It should be remembered that, despite these significant differences in the prevalence of personality disorders, there are none linked to the commission of crimes.

The correlation matrix shows a very similar development in terms of PCL-R and CAPP scores in both groups. The correlations between PCL-R factors and facets and CAPP dimensions present a very similar distribution and grouping. In women, the high correlation between PCL-R facet 2 and the CAPP's Attachment and Self domains stands out. In men, on the other hand, the Behavioural and Cognitive

CAPP dimensions correlate more strongly with the other dimensions of the same instrument.

The multivariate analysis extends previous findings in showing that the CAPP, especially its Emotional, Dominance and Self dimensions, makes it possible to differentiate men from women, with the latter obtaining significantly higher scores. The PCL-R, for its part, allows discrimination between genders fundamentally through facet 4, anti-social behaviour, which is significantly higher in men, as reported in previous studies (Carabellese et al., 2019; Dolan & Vollm, 2009; Gray & Snowden, 2016; Guay et al., 2018; Nicholls et al., 2005; Thomson, 2017; Verona et al., 2013; Wynn et al., 2012). The results of the PCL-R are consistent with previous research, but those of the CAPP, which are more innovative, indicate that the assessment of psychopathy in women would be undervalued were the PCL-R not completed with this other instrument, more sensitive in its assessment of the psychopathology of personality. The fact that there are no significant differences in the prevalence of violent crime, nor in the percentage of men and women exceeding the European cut-off point for psychopathy in the PCL-R (a score of 25 or higher) reinforces the importance of these findings.

The univariate analysis of inmates with a PCL-R score of 25 or above provides another finding of great interest. Facet 4 again exhibits a significant difference between women and men, with the latter scoring higher. This difference indicates the importance of the facet in the PCL-R scores in the male sample. To enter the psychopathy range, men need high scores in this facet, while women, compared to men, achieve psychopathic level scores in a more balanced way across facets. In other words, to be considered psychopathic from the PCL-R point of view, men usually have to be highly antisocial but women do not. Unfortunately, the PCL-R cut-off point cannot be extrapolated to the CAPP, and the CAPP does not have its own cut-off points. For this reason, we cannot firmly state that the CAPP dimensions do not show significant differences between more psychopathic women and men, but that they simply do not show them when a cut-off point of 25 is used in the PCL-R. It is essential in PDs of a dimensional and non-categorical nature to avoid confusing a cut-off point with a diagnosis.

Logistic regression confirms that facet 4 of the PCL-R in men and the Self domain of the CAPP in women are the variables which, at the level of facets and domains, most discriminate between genders. Once again, the importance of combining the assessment of the PCL-R with that of the CAPP can be appreciated.

The question arises of how to interpret the inability of the Support Vector Machine Model to discriminate between men and women. One possibility could be that the sample of women was insufficient; another alternative is that the significant variables indicated so far did not have enough power to meet this last requirement level. This lat-

ter hypothesis would point to the impossibility of creating a predictive model to differentiate women from men using the PCL-R together with the CAPP in assessing psychopathy. In other words, we could not show clinical and forensic staff that facet 4 of the PCL-R, based on a certain score, allows males to be detected in a sample, or conversely, females using the Self domain of the CAPP. This does not invalidate the results obtained previously in univariate analysis and logistic regression. It is not surprising that there is no variable in the CAPP or the PCL-R that, based on its score, allows women to be differentiated from men; after all, previous research has not established that there is a symptom, signal, behaviour or crime that cannot be present in its maximum intensity in both women and men.

This study has limitations. It was previously mentioned that the number of women in this sample is representative but small. To achieve greater statistical power, it would be necessary to increase the number of women in the sample. This poses a problem because ensuring that the sample is not one of convenience and remains representative of the Spanish prison population means that the number of men included would also have to increase proportionally, thus complicating the study and making it more expensive. Secondly, although the researchers aimed to keep the results of the psychopathy assessment instruments blinded from the PDs of the rest of the socio-demographic, consumption and crime variables, given that the PCL-R, CAPP and IPDE require an interview to be carried out, it is possible that some of the inmates would involuntarily break the blind during the interviews.

In conclusion, this study shows that there are significant differences between women and men when the same instruments are applied in the assessment of psychopathy and both groups are balanced regarding substance use. Women present more psychopathology of the personality than men, especially with regard to the self, and to a lesser extent emotional disturbances and dominance. Therefore, in this sample, narcissistic, borderline and histrionic PDs are more frequently present in women. It is essential to remember that the CAPP is the instrument that captures this difference clearly, not the PCL-R. In contrast, men have a higher prevalence of antisocial behaviours compared to women, and are therefore diagnosed more often with APD. Again, it is essential to indicate that in this case the difference is detected with the PCL-R and not with the CAPP. Given the above, it is necessary to remind clinical and forensic staff that in order to capture these gender differences clearly when assessing psychopathy, they must combine the instruments, since the use of only the PCL-R would involve losing the ability to capture part of the psychopathological differences that exist between women and men. Despite these differences, the construct of psychopathy is very similar in both genders, with no symptom or item that clearly discriminates between women and men.

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Conflict of interests

The authors declare no conflict of interest in relation to the conduct of this study.

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