Confirmatory factor analysis of the Antisocial Process Screening Device: Self-Report among incarcerated male juvenile offenders

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Abstract

The main aim of the present study was to examine the factor structure, internal consistency and some additional psychometric properties of the Antisocial Process Screening Device – Self-Report (APSD-SR) among a large forensic sample of incarcerated male juvenile offenders (N = 438). The results, based on this forensic sample, support the use of the APSD-SR in terms of its factor structure, and internal consistency despite the fact an item had to be removed from the callous-unemotional (CU) dimension. Statistically significant positive associations were found with measures of psychopathic traits, callous-unemotional traits, narcissism, and aggression, as well as negative associations with a measure of empathy. Findings provide support for the use of the APSD-SR among the incarcerated male juvenile offender population.

Keywords: Antisocial Process Screening Device – Self-Report (APSD-SR); adolescence; juvenile delinquency; psychopathic traits; validation

Over the last decades research has extended the concept of psychopathy to children and adolescents, suggesting that those with elevated psychopathic traits are a particularly important subgroup of antisocial youth who tends to engage in more severe, persistent, and aggressive types of behaviors and also shows especially poor treatment responses compared to antisocial youth with normative levels of psychopathic traits (Edens, Campbell, & Weir, 2007; Feilhauer & Cima, 2013; Frick, 2009; Frick & White, 2008; Salekin & Lynam, 2010). Therefore, psychopathic traits may have strong clinical and forensic relevance for identifying a subgroup of antisocial youth with unique etiologies and particularly severe and persistent behavior problems and delinquent behaviors.

The Antisocial Process Screening Device (APSD; Frick & Hare, 2001) is currently the most researched questionnaire measure of child and youth psychopathy (Patrick, 2010; Sharp and Kine, 2008). It was developed as a 20-item measure originally designed for children (aged 6 to 13 years), whose items are scored on a 3-point ordinal scale and were adapted to better reflect life experiences in school, peer, and family domains. In its current version, the APSD is basically a downward extension of the Psychopathy Checklist–Revised (PCL-R; Hare 1991) adult model of psychopathy, and originally it was called Psychopathy Screening Device. For example, item 12. "Feels bad or guilty" (R) from the callous-unemotional (CU) dimension relates to the PCL-R item that assesses callousness/lack of empathy; item 6. "Lies easily and skillfully" taps the pathological lying item. The APSD ratings are obtained from adults (parents or teachers) who know the youths well and are willing to collaborate.

Caputo et al. (1999) adapted an experimental self-report version of the APSD (APSD-SR) for use with older youths (aged 12 to 18 years) by creating second person stems for each item (e.g., item 6. "You lie skillfully and easily"). These authors, using a

sample of adjudicated male adolescents (*N* = 69), were able to show that APSD-SR scores distinguished violent sex offenders from non-sexual violent offenders and nonviolent offenders, and were correlated with a variety of offenses before institutionalization and with violence while incarcerated. Self-report tends to become more reliable and valid as a child enters adolescence, especially for assessing antisocial tendencies and attitudes that may not be observable to parents and other significant adult (see Frick, Barry, & Bodin, 2000). Although not originally designed specifically for use with justice-involved youths, it is particularly important to evaluate the self-report version of the APSD with this population because it has become a popular measure for assessing psychopathic features in justice-involved adolescents (Poythress, Douglas, et al., 2006).

The issue of factor structure is important due to the ongoing process of how best to define and measure psychopathy. According to Forth, Kosson, and Hare (2003), the possibility that the PCL family of instruments (e.g., PCL-R, PCL:YV, APSD) may share a similar factor structure suggests that there may be considerable continuity in the structure of psychopathy from adolescence to adulthood. Some studies using the APSD-SR have provided supporting evidence for the three-factor model. For example, Vitacco, Rogers, and Neumann (2003), using two separate samples of male and female adolescent offenders incarcerated in a maximum security facility (*n* = 78) and a local juvenile detention facility (*n* = 77), examined the factor structure of the APSD-SR and reported a very good fit for the three-factor model, but that the original two-factor model fit their data poorly. However, items 19. "Does not show emotions" and 20. "Keeps same friends" (R) failed to reach a minimum .30 loading which raised concerns about these items of the CU dimension, especially item 19. Poythress, Dembo, Wareham, and Greenbaum (2006), using a sample of 165 male and female adolescents

referred to a arbitration program for youths arrested for the first time, reported a good fit for a modified version of the three-factor model of the APSD-SR excluding items 19 and 20.

Cross-cultural research with the APSD-SR on the structural variance of youth psychopathy measures is also emerging in non-North American countries, although results regarding its factor structure are not consistent. For example, Fritz, Ruchkin, Kaposov, and Klinteberg's (2008), using a Russian youth inmate sample (N = 250) who voluntarily completed the APSD-SR, found poor fits for both the three-factor model and two-factor model; as a second option, they used a principal components analysis that offered some support for the three-factor model. Pechorro et al. (2013), using a mixed community and forensic sample of Portuguese male and female youths (N = 760) concluded that a modified two-factor structure (including items 2 and 6) provided the best option for the APSD-SR in terms of structural validity and internal consistency. Colins et al. (2014) examined the factor structure of the APSD-SR in a sample of detained Belgian female adolescents (N = 191), and found that the three-factor model and the two-factor model did not reach the criteria for acceptable fits; despite the fact the two-factor model was better in terms of fit these authors decided to use the three-factor structure in all further analysis because the developer of the APSD-SR suggested that was the factor structure of choice.

The debate to determine the most appropriate factor structure of the APSD-SR is still ongoing, and it remains unclear whether and how the findings generalize cross-culturally as most studies are based on North American samples. Some studies (e.g., Colins et al., 2014) provide stronger evidence for the presence of two main factors: the CU factor comprising items tapping interpersonal and affective dimensions of psychopathy such as lack of guilt and absence of empathy, and an impulsivity-conduct

problems (I-CP) factor containing items tapping overt behavioral manifestations of poor impulse control. Other studies (e.g., Fritz et al., 2008) provide stronger evidence for the presence of three main factors: the CU factor and two further factors, namely impulsivity, and narcissism. This leads us to conclude that further investigation is needed regarding the factor structure of the APSD-SR, particularly studies among non-North American subjects.

Another very important issue regarding the psychometric properties of the APSD-SR is the internal consistency of the CU dimension. Poythress, Douglas, et al. (2006) found that it was consistently poor across 10 studies of juvenile justice-involved youths, raising the possibility this was due to a defensive response style triggered by their involvement in the justice system; these authors suggested that investigators should exclude items 19 and 20 for purposes of assessing CU features when using the APSD-SR with justice-involved adolescents. Addressing these limitations is extremely important given the recent inclusion of CU traits as a specifier ("with Limited Prosocial Emotions") for Conduct Disorder in the Fifth Edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5; American Psychiatric Association, 2013). Given its relevance, more research is needed regarding the measurement of CU traits in samples representative forensic populations (Frick, Ray, Thornton, & Kahn, 2014a).

In terms of the concurrent validity of the APSD-SR with relevant external criteria, research typically finds that psychopathic traits in general and CU traits in particular are positively correlated with age of criminal onset, conduct disorder, aggression, and antisocial outcomes including delinquency (Ciucci, Baroncelli, Franchi, Golmaryami, & Frick, in press; Essau, Sasagawa, & Frick, 2006; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). A few studies have also examined the associations between the APSD and other

measures of CU traits and, in general, find strong convergence (Fink, Tant, Tremba, & Kiehl, 2012; Kimonis et al., 2008; Roose et al., 2010). Other relevant correlates of psychopathic traits and CU traits in particular include substance use (e.g., Hillege, Das, & de Ruiter, 2010; Poythress et al., 2006).

The APSD-SR has become a popular research instrument in studies with justice-involved youth, but more research is needed to support its increased use among this population. The main aim of this study is the analysis of the structural validity and internal consistency of the APSD-SR, giving special attention to its CU dimension, among a large sample of incarcerated male juvenile offenders. It is hypothesized that: a) some problems will be found in terms of item loadings of the three-factor structure, and also in terms of the internal consistency of the CU dimension; b) significant associations will be found with other psychopathic traits measures and related constructs (e.g., proactive aggression); and c) significant associations will be found with conduct disorder, age of criminal onset, crime seriousness, violent crimes, alcohol use, and drug use.

Method

Participants

Male inmates from the eight nation-wide juvenile detention centers managed by the Portuguese Ministry of Justice voluntarily agreed to participate in the current study (N = 438). They were all detained by the court's decision. Incarceration into juvenile detention centers is the hardest measure a Portuguese court can decide. Seven of the detention centers are considered low to medium security, and one is considered maximum security (exclusively used for youths tried as adults).

The participants (mean age = 17.15 years; *SD* = 1.76 years; range = 12 – 20 years) were mainly white Europeans (56.7%) from an urban background (93.5%). On average, participants reported their first criminal problems beginning at the age of 11.78 years-old (*SD* = 2.36), most were detained before they were 16 years old (*M* = 15.36, *SD* = 1.38), and had been convicted to an average of 25 months in detention (*M* = 25.38, *SD* = 6.97). Most of them (89.8%) were convicted of having committed serious and violent crimes (e.g., homicide, robbery, assault, rape).

Measures

The Antisocial Process Screening Device – Self-Report (APSD-SR; Frick & Hare, 2001; Caputo, Frick, & Brodsky, 1999) is a multidimensional 20-item measure designed to assess psychopathic traits in adolescents. It was modeled after the PCL-Revised (PCL-R; Hare, 2003). Each item is scored on a 3-point ordinal scale (0 = *Not at all true*, 1 = *Sometimes true*, or 2 = *Definitely true*). The total score, as well as each dimension score, is obtained by adding the respective items. Higher scores are indicative of an increased presence of psychopathic traits (Frick & Hare, 2001, p. 1). The Portuguese adaptation of the APSD-SR (Pechorro et al., 2013) was used. Internal consistency reliability statistics for the APSD-SR will be given later in this paper.

The Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002) is a 50-item self-report measure designed to assess the core personality traits of the psychopathic personality constellation in youth aged 12-years-old and up. Each item is scored on an ordinal 4-point Likert scale ranging from *Does not apply at all* to *Applies very well*. The YPI consists of 10 subscales (with 5 items each) designed in line with a three-dimensional conceptualization of the psychopathy construct, namely: the Grandiose-Manipulative dimension, the Callous-Unemotional and the Impulsive-Irresponsible dimension. Higher scores reflect an increased presence of the

characteristics associated, namely psychopathic traits. The Portuguese validation of the YPI was used (Pechorro, Andershed, Ray, Maroco, & Gonçalves, submited). The internal consistency for the current study, estimated by Cronbach's alpha, was: YPI total = .88; Grandiose-Manipulative dimension = .87; Callous-Unemotional = .71; and Impulsive-Irresponsible dimension = .79.

The Inventory of Callous-Unemotional Traits (ICU; Essau et al., 2006; Kimonis et al., 2008) is a 24-item self-report scale designed to assess callous-unemotional traits in youth derived from the callous-unemotional (CU) subscale of the Antisocial Process Screening Device (APSD; Frick & Hare 2001). Each item is scored on a four-point scale (form 0 = *Not at all true*, to 3 = *Definitely true*). The ICU provides both a total score and three subscale scores, namely: Callousness, Uncaring, and Unemotional. Scores are calculated by reverse-scoring the positively worded items and then summing the items to obtain a total score. Higher scores indicate an increased presence of CU traits. The Portuguese version of the ICU was used (Pechorro, Andershed, .Barroso, Maroco, & Gonçalves, in press). The internal consistency for the current study, estimated by Cronbach's alpha, was: ICU total = .91; Callousness dimension = .89; Uncaring dimension = .86; and Unemotional dimension = .88.

The Narcissistic Personality Inventory – 13 (NPI-13; Gentile et al., 2013) is a short form of the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) which is considered by far the most widely used measure of grandiose narcissism. The NPI-13 consists of 13 statements, among which one is considered to confirm an attitude of narcissism, and the other is not. The NPI-13 provides both a total score and three subscale scores, namely: Leadership/Authority, Grandiose Exhibitionism, and Entitlement/Exploitativeness. Higher scores indicate an increased presence of the associated characteristics. A Portuguese version of the NPI-13, especially adapted for

use with adolescents, was used (Pechorro, Gentile, Ray, Nunes, & Gonçalves, submitted). The internal consistency for the current study, estimated by Kuder-Richardson coefficient, was: NPI-13 total = .84; Leadership/Authority dimension = .77; Grandiose Exhibitionism dimension = .72; and Entitlement/Exploitativeness dimension = .62.

The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) is a 20-item self-report measure designed to assess empathy in youths. The BES was developed as a concise and coherent scale with the aim of measuring two distinct factors: affective empathy (11 items), and cognitive empathy (9 items). Each item is scored on a five-point ordinal scale (from 1 = *Strongly disagree* to 5 = *Strongly agree*). Scores are calculated by reverse-scoring the positively worded items and then summing the items to obtain the total score and the factors scores. Higher scores indicate an increased presence of the associated characteristics. The Portuguese version of the BES was used (Pechorro, Ray, Salas-Wright, Maroco, & Gonçalves, in press). The internal consistency for the current study, estimated by Cronbach's alpha, was: BES total = .91; Affective dimension = .87; and Cognitive dimension = .90.

The Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006) is a self-report measure that distinguishes between reactive and proactive aggression. The RPQ consists of 23 items rated on a 3-point ordinal scale (0 = *Never*, 1 = *Sometimes*, 2 = *Often*). A total of 11 items assess reactive aggression (e.g., "Reacted angrily when provoked by others") and 12 items assess proactive aggression (e.g., "Hurt others to win a game"). Summed scores provide a measure of reactive or proactive aggression, as well as total aggression. Higher scores indicate higher levels of aggression. The RPQ is appropriate for use with youth in late adolescence and young adults. The Portuguese version of the RPQ was used (Pechorro, Ray, Raine, Maroco, & Gonçalves, submitted).

The internal consistency for the current study, estimated by Cronbach's alpha, was: RPQ total = .93; Reactive dimension = .86; and Proactive dimension = .91.

The Sellin-Wolfgang Index of Crime Seriousness (ICS; Wolfgang et al., as cited in White et al., 1994) guided the delinquency seriousness classification of the official court reports. Level 0 consisted of no delinquency. Level 1 consisted of minor delinquency committed at home, such as stealing minor amounts of money from mother's purse. Level 2 consisted of minor delinquency outside the home including shoplifting something worth less than 5 euros, vandalism and minor fraud (e.g. not paying bus fare). Level 3 consisted of moderately serious delinquency such as any theft over 5 euros, gang fighting, carrying weapons, and joyriding. Level 4 consisted of serious delinquency such as car theft and breaking and entering. Level 5 consisted of having performed at least two of each of the behaviors in level 4.

A questionnaire was constructed to describe the socio-demographic and criminal characteristics of the participants, to offer a descriptive account of the sample, and to explore the association of some of these variables (e.g., age of onset) with APSD-SR scores. This questionnaire included variables such as participants' age, nationality, ethnic group (white Europeans vs. minorities), level of schooling completed, age of crime onset, age of first problem with the law, age of first incarceration, length of the conviction, taking of psychiatric drugs, use of physical violence in committing crimes, alcohol use, cannabis use, and cocaine/heroin use. DSM-5's Conduct Disorder (CD; American Psychiatric Association, 2013) was assessed using the official diagnostic criteria (i.e., the standard method described in the DSM-5).

Procedures

Authorization to assess youths was obtained from the General Directorate of Reintegration and Prison Services – Ministry of Justice (*Direção-Geral de Reinserção e*

Serviços Prisionais – Ministério da Justiça). The detainees were informed about the nature of the study and asked to voluntarily participate. The participation rate was approximately 90%. Motives for not participating included: refusal to participate (5%), inability to participate due to not understanding the Portuguese language (4%) and inability to participate due to security issues (1%). Participants who were unwilling or unable to collaborate were excluded. The measures were administered by means of individual face-to-face interviews in an appropriate setting by the first author of this article (which is a trained forensic psychologist and Professor of Forensic Psychology). Institutional files were also used to complement the information obtained (e.g., prior criminal activity and detentions). Some of the information (e.g., socio-demographic variables) was obtained from self-reports.

The data were analyzed using SPSS v22 (IBM SPSS, 2013) and EQS 6.2 (Bentler & Wu, 2008). The factor structure of the Portuguese language version of the APSD-SR was assessed with Confirmatory Factor Analysis (CFA) performed in EQS 6.2 (Bentler & Wu, 2008; Byrne, 2006). Goodness of fit indices were calculated, including Satorra-Bentler chi-square/degrees of freedom, comparative fit index (CFI), incremental fit index (IFI), and root mean square error of approximation (RMSEA). A chi-square/degrees of freedom value < 5 is considered adequate, ≤ 2 is considered good and values = 1 are considered very good (Maroco, 2014; West, Taylor, & Wu, 2012). A CFI $\geq .90$ and RMSEA $\leq .10$ indicate adequate fit, whereas a CFI $\geq .95$ and RMSEA $\leq .06$ indicate good model fit (Byrne, 2006). The incremental fit index, also known as Bollen's IFI, is relatively insensitive to sample size; values that exceed .90 are regarded as acceptable. In terms of the Akaike Information Criterion (AIC), which measures the expected discrepancy between the true model and the hypothesized model, the model with the smallest AIC should be selected (West et al., 2012).

The CFA was performed on the original scale items and only items with standardized loading above .30 were retained (Nunnally & Bernstein, 1994). Polychoric correlations with robust methodologies were used to perform the CFA on the ordinal items and modification indices were considered (Byrne, 2006). Pearson correlations were used to analyze associations between scale variables, Spearman correlations were used with ordinal variables, and point-bisserial correlations were used to analyze associations between nominal dichotomous variables and scale variables (Leech, Barrett, & Morgan, 2015).

Results

Our first step in examining the psychometric properties of the Portuguese version of the APSD-SR among incarcerated male juvenile delinquents was to attempt to replicate, by means of CFA using the ML method, the different factor structures proposed for this instrument. In Table 1 are shown the goodness of fit indices we obtained regarding the different models. The single-factor first-order model did not fit the data well, and we must mention that the S-Bχ^2/df index was never below the more recommended level of 2 in any of the models, including the three-factor first order inter-correlated modified model which had the lowest AIC. We were able to find the strongest support in terms of goodness-of-fit indices for the three-factor first order inter-correlated modified robust structure not including items 20, 2 and 6. It is worth pointing out that item 20 did not reach a minimum .30 loading, and that items 2 and 6 were not originally included in the three-factor structure (see Frick & Hare, 2001; see also Table 2).

Table 1

Goodness of fit indexes for the different ML models of the APSD-SR

APSD-SR	S-Bχ^2 / df	IFI	CFI	RMSEA (90% CI)	AIC
1-factor †	4.43	.85	.85	.09(.08-.10)	412.99
2-factor (Frick et al.) ††	2.33	.94	.94	.06(.05-.06)	44.03
2-factor (i20 exc)	2.32	.95	.95	.06(.05-.06)	38.01
2-factor (i2 & i6 inc) ††	2.58	.93	.93	.06(.05-.07)	98.49
3-factor (manual) ††	2.23	.94	.94	.05(.05-.06)	30.21
3-factor (i20 exc)	2.21	.95	.95	.05(.04-.06)	24.05
3-factor (i19 & i20 exc)	2.41	.95	.95	.06(.05-.07)	41.65

Note. APSD-SR = Antisocial Process Screening Device – Self-Report; S-Bχ^2 = Satorra-Bentler chi-square; df = degrees of freedom; IFI = Incremental Fit Index; CFI = Comparative Fit Index; RMSEA (90% CI) = Root Mean Square Error of Approximation (90% Confidence Interval); AIC = Akaike Information Criterion; ML = Maximum Likelihood; 2-factor (Frick et al.)* = 2-factor (Frick, Bodin, & Barry, 2000); 2-factor (i20 exc) = 2-factor with item 20 excluded; 2-factor (i2 & i6 inc)* = 2-factor with items 2 and 6 included; 3-factor (i20 exc) = 3-factor with item 20 excluded; 3-factor (i19 & i20 exc) = 3-factor with items 19 and 20 excluded

† = items 7, 19, and 20 did not reach a .30 loading; †† = item 20 did not reach a .30 loading

Table 2 displays the item loadings for the three-factor first order inter-correlated modified robust structure without items 2, 6, and 20 with the ML robust method. While this model is not entirely consistent with prior research in not including item 20 in the CU dimension because it did not reach the minimum acceptable level of loading (i.e., .30), it can be gleaned from the table that the loadings of the items are very similar with factors identified in prior research (Frick & Hare, 2001).

Table 2

Item loadings for the confirmatory 3-factor first order inter-correlated modified robust structure without items 2, 6, and 20

APSD-SR items	Factor 1	Factor 2	Factor 3
1. Blames others for mistakes	.53		
2. Engages in illegal activities	--	--	--
3. Concerned about schoolwork (R)			.60
4. Acts without thinking	.48		
5. Shallow emotions		.39	
6. Lies easily and skillfully	--	--	--
7. Keeps promises (R)			.33
8. Brags about accomplishments		.53	
9. Gets bored easily			
10. Uses or cons others	.34	.70	
11. Teases other people		.65	
12. Feels bad or guilty (R)			.65
13. Risky and dangerous behaviors			
14. Charming in insincere ways	.52	.55	
15. Becomes angry when corrected		.48	
16. Thinks he is more important		.63	
17. Does not plan ahead	.50		
18. Concerned about feelings of others (R)			.70
19. Does not show emotions			.57
20. Keeps same friends (R)	--	--	--

Note. APSD-SR = Antisocial Process Screening Device – Self-Report; R = Reversible items

Table 3 presents the correlations among the APSD-SR total and its dimensions. These correlations were moderate to strong as expected, thus, further analyses examining associations with external criteria accounted for the shared variance among the subscales.

Table 3

Pearson correlations matrix

	APSD total	3-factor total	IMP	NAR	CU
APSD total	1				
3-factor total	.99***	1			
IMP	.79***	.81***	1		
NAR	.83***	.84***	.61***	1	
CU	.68***	.69***	.33***	.29***	1

Note. APSD = Antisocial Process Screening Device –Self-Report; IMP = Impulsivity dimension; NAR = Narcissism dimension; CU = Callous-Unemotional dimension

***significant at the .001 level

Our next step was the estimation of Cronbach's alpha, mean inter-item correlation and corrected item-total correlation range (see Table 4). Most of these values can be considered good.

Table 4

Cronbach's Alpha, mean inter-item correlation, and corrected item-total correlation range

APSD-SR	Cronbach α	MIIC	CITCR
APSD-SR total	.83	.20	.00 – .58
3-factor total	.82	.21	.26 – .56
IMP	.60	.23	.29 – .42
NAR	.76	.31	.36 – .60
CU	.70	.32	.26 – .57

Note. APSD-SR = Antisocial Process Screening Device –Self-Report; IMP = Impulsivity dimension; NAR = Narcissism dimension; CU = Callous-Unemotional dimension; Cronbach α = Cronbach´s alpha; MIIC = Mean inter-item correlation; CITCR = Corrected item-total correlation range

The convergent validity of the APSD-SR total and its dimensions with the YPI, the ICU, the NPI-13, and the RPQ revealed mostly the expected moderate to high statistically significant positive correlations. On the other hand, the discriminant validity

with the BES revealed the expected negative or null correlations due to non-overlapping constructs (see Table 5).

Correlations of the APSD-SR and its dimensions with other variables (e.g., age, education) were also analyzed (see Table 6). Statistically significant correlations were found with age of crime onset, CD symptoms (scored as a scale), CD diagnosis (coded No = 0, Yes = 1), crime seriousness (coded as ordinal scale), violent crimes (coded No = 0, Yes = 1), alcohol use, cannabis use, and cocaine/heroin use (coded as five-point ordinal scales). It is worth mentioning that the Callous-Unemotional dimension of the APSD-SR had a low statistically significant negative correlation with the age variable. Regarding the DSM-5 Conduct Disorder diagnostic, a very high prevalence rate of 92.6% was found in our sample.

Table 5

Correlations of the APSD-SR with other measures

	APSD-SR total	APSD-SR 3-factor total	APSD-SR Impulsivity	APSD-SR Narcissism	APSD-SR Callous-Unemotional
YPI total	.64***	.63***	.52***	.60***	.31***
YPI GM	.57***	.56***	.42***	.62***	.19**
YPI CU	.46***	.46***	.33***	.42***	.29***
YPI II	.55***	.55***	.55***	.39***	.34***
ICU total	.62***	.62***	.43***	.35***	.68***
ICU Callousness	.58***	.58***	.47***	.40***	.48***
ICU Uncaring	.53***	.54***	.32***	.29***	.65***
ICU Unemotional	.25***	.23***	.10^{ns}	.02^{ns}	.44***
NPI-13 total	.40***	.38***	.35***	.46***	.04^{ns}
NPI-13 LA	.33***	.32***	.27***	.39***	.06^{ns}
NPI-13 GE	.27***	.25***	.26***	.33***	-.04^{ns}
NPI-13 EE	.42***	.39***	.33***	.45***	.08^{ns}
RPQ total	.68***	.66***	.61***	.63***	.26***
RPQ Reactive	.59***	.57***	.57***	.56***	.18**
RPQ Proactive	.65***	.63***	.55***	.60***	.28***
BES total	-.13*	-.14*	.11^{ns}	.05^{ns}	-.49***
BES Affective	-.17**	-.17**	.08^{ns}	-.02^{ns}	-.46***
BES Cognitive	-.06^{ns}	-.08^{ns}	.10^{ns}	.08^{ns}	-.38***

Note. APSD-SR = Antisocial Process Screening Device – Self-Report; YPI = Youth Psychopathic Traits Inventory; YPI GM = Grandiose-Manipulative dimension; YPI CU = Callous-Unemotional dimension; YPI II = Impulsive-Irresponsible dimension; ICU = Inventory of Callous-Unemotional Traits; NPI-13 = Narcissistic Personality Inventory 13 items short version; NPI-13 LA = Leadership/Authority dimension; NPI-13 GE = Grandiose Exhibitionism dimension; NPI-13 EE = Entitlement/Exploitativeness dimension; RPQ = Reactive-Proactive Aggression Questionnaire; BES = Basic Empathy Scale

*** significant at the .001 level; ** significant at the .01 level; * significant at the .05 level; *ns* = non-significant

Table 6

Correlations of the APSD-SR with other variables

	APSD-SR total	APSD-SR 3-factor total	APSD-SR Impulsivity	APSD-SR Narcissism	APSD-SR Callous-Unemotional
Age	-.01^{ns}	-.04^{ns}	-.02^{ns}	.06^{ns}	-.15*
Education (years)	-.01^{ns}	-.03^{ns}	-.12^{ns}	.05^{ns}	-.03^{ns}
Ethnicity	-.12^{ns}	-.13^{ns}	-.11^{ns}	-.09^{ns}	-.10^{ns}
Psychiatric drugs	.13^{ns}	.16*	.24***	.10^{ns}	.05^{ns}
ACO	-.23***	-.22***	-.20**	-.15*	-.16*
AFPL	-.12^{ns}	-.11^{ns}	-.14*	-.04^{ns}	-.09^{ns}
AFIJDC	-.13^{ns}	-.14*	-.09^{ns}	-.05^{ns}	-.18**
CD symptoms	.52***	.49***	.43***	.41***	.29***
CD diagnosis	.29***	.26***	.26***	.19**	.15*
ICS	.28***	.27***	.23**	.23**	.16*
PVC	.21**	.21**	.15*	.19**	.13^{ns}
NCC	.04^{ns}	.05^{ns}	.10^{ns}	.03^{ns}	.00^{ns}
Alcohol	.27***	.25***	.29***	.17**	.14*
Cannabis	.32***	.31***	.33***	.21**	.19**
Cocaine/heroin	.35***	.34***	.27***	.30***	.22***
Unprotected sex	.10^{ns}	.08^{ns}	.15*	.11^{ns}	-.09^{ns}

Note. ACO = Age of crime onset; AFPL = Age of first problem with the law; AFIJDC = Age of first incarceration into a Juvenile Detention Center; CD symptoms = DSM-5 Conduct Disorder symptoms scored as a scale; CD diagnosis = DSM-5 Conduct Disorder diagnosis; ICS = Index of Crime Seriousness; PVC = Previous violent crimes; NCC = Number of criminal charges

*** significant at the .001 level; ** significant at the .01 level; * significant at the .05 level; *ns* = non-significant

Discussion

The main aim of this study was the analysis of the structural validity and internal consistency of the APSD-SR among a Portuguese sample of incarcerated male juvenile offenders. We hypothesized that we would find some problems in terms of item loadings and in terms of the internal consistency of the CU dimension, and that significant associations would be found with other measures (e.g., YPI, ICU) and variables (e.g., CD, age of criminal onset, crime seriousness, violent criminality, alcohol use, drug use). Regarding the factor structure of the APSD-SR, the fit indices for the two-factor models were considered acceptable but most three-factor models showed an increase in fit. We were able to find the strongest support for the three-factor first order inter-correlated modified model without items 2, 6, and 20. Items 2 and 6 were not included in the factor-model (as originally proposed by Frick and Hare, 2001), and the exclusion of item 20 from the CU dimension is consistent with prior research assessing CU traits using the APSD-SR with justice-involved adolescents (see Poythress, Douglas, et al., 2006). Our study provides additional evidence for a three-factor model of the APSD-SR, and is in line with previous North American studies (e.g., Vitacco et al., 2003). The correlations between the APSD-SR total, the three-factor structure and its dimensions showed mostly moderate to high statistically significant positive associations. These values were somewhat higher than the ones found in prior studies (e.g., Pechorro et al., 2013).

The analysis of the internal consistency revealed mostly good to very good values, with most values exceeding the recommended minimum Cronbach's alpha of .70 (Kaplan & Saccuzzo, 2009), again somewhat higher than those reported in previous studies (e.g., Lee, Vincent, Hart, & Corrado, 2003; Kruh, Frick, & Clements, 2005). Even the CU dimension had a good alpha of .70 due to the removal of item 20 from this

dimension. The exception was the Impulsivity dimension, with an alpha of .60 which puts into question the fidelity of measurements for this dimension, although it was higher than values reported in previous studies (e.g., Falkenbach, Poythress, & Heide, 2003; Poythress et al., 2006). Regarding the mean inter-item correlations, no problems were found because the APSD-SR total and its dimensions within the recommended value range of .15 - .50 (Clark & Watson, 1995; Domino & Domino, 2006), revealing an adequate homogeneity between the items that was not found in other previous studies (e.g., Lee et al., 2003). In terms of the corrected item-total correlation range, most of the results obtained were above the minimum recommended value of .20 (Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994). The exception was the APSD-SR total with a minimum correlation value of .00 caused by item 20, not present in the three-factor structure and in the rest of the dimensions (including the CU dimension).

The convergent validity of the APSD-SR and its dimensions with the YPI, the ICU, the NPI-13 and the RPQ revealed mostly moderate to high statistically significant positive correlations demonstrating the expected overlap in line with the ones found in previous studies (e.g., Colins et al., 2014; Kimonis et al., 2008; Poythress et al., 2006; Roose et al., 2010). The exception was the CU dimension, which had non-significant correlations with the NPI-13 total and its dimensions. With regard to discriminant validity, the correlation with the BES revealed the expected non-significant or negative correlations (American Psychological Association, 1999; Kaplan & Saccuzzo, 2009). The concurrent validity of the APSD-SR and its dimension with DSM-5's Conduct Disorder (American Psychiatric Association, 2013) symptoms (scored as a scale) and diagnosis revealed the expected moderate to moderate-high associations that were within the typical correlation range found with measures of youth psychopathy (e.g., Forth et al., 2003; Pechorro et al., 2013); the exception was again the CU dimension

with the lowest correlations. The prevalence of conduct disorder found in the current sample was higher than those generally found among forensic samples (Sevecke & Kosson, 2010).

The correlations between the APSD-SR and measures of criminal behavior revealed mostly moderate-low negative associations with age of crime onset, moderate-low positive associations with crime seriousness and previous violent crimes. Additionally, these findings were consistent across the subscales of the APSD-SR, with the exception of the CU dimension which revealed mostly low correlations and a non-significant correlation (with the previous violent crimes variable). Such negative associations between psychopathic traits scores and the age of crime onset have been consistently reported in the literature (e.g., Forth et al., 2003), although the present study mostly failed to show significant correlations with age of first problem with the law and age of first incarceration into a Juvenile Detention Center. Positive associations between measures of psychopathic traits and antisocial and criminal behavior similar to those identified in the current study have been consistently reported in prior studies (e.g., Dolan & Rennie, 2006; Poythress et al., 2006; Salekin et al., 2010). The correlations of the APSD-SR and its dimensions with alcohol use, cannabis use, and cocaine/heroin use revealed mostly moderate positive associations in line with what has been reported regarding other measures of psychopathic traits (e.g., Colins et al., 2012; Hillege, Das, & de Ruiter, 2010; Poythress et al., 2006), and it is worth mentioning that the CU dimension obtained the lowest correlations with these variables.

Our findings provide some additional support for the use of the APSD-SR among incarcerated male juvenile offenders across different cultures and ethnicities. We were able to add some more evidence to prior investigations, namely in terms of confirming the three-factor structure of the APSD-SR as the best option, demonstrating

that the CU dimension of the APSD-SR can indeed be improved in terms of reliability, and corroborating the presence of significant associations with other measures and criminal variables. In terms of limitations of our study, cross-validation samples would have been useful to confirm the present findings, and more sophisticated nested models statistics could have been used to compare the different factor-models we tested. We could also have used measures of psychopathy that are not self-report (e.g., PCL:YV) to analyze the convergent validity. We must point out that further research is needed, especially using samples of female juvenile offenders because females are a growing part of the incarcerated youth population. We hope that our study may promote future research and a more optimized use of the APSD-SR among incarcerated youths in Southern European countries and Portuguese speaking countries.

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