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ORIGINAL PAPER

The Proposed Specifiers for Conduct Disorder (PSCD): External Correlates and Incremental Validity over Alternate Psychopathy Measures

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Abstract

Background The Proposed Specifiers for Conduct Disorder (PSCD) assesses psychopathy components of grandiose-manipulative (GM), callous-unemotional (CU), daring-impulsive (DI), and conduct disorder (CD). Research on PSCD is still in its infancy, and further research is necessary to examine its psychometric properties.

Objective We investigated the correlations between PSCD scores and their corresponding Antisocial Process Screening Device (APSD) and Youth Psychopathic Traits Inventory-Short Version (YPI-S) scores. We also compared their associations with external variables and explored the incremental contribution of PSCD scores over APSD and YPI-S scores. The incremental contribution of PSCD GM, CU, and DI subscales over its CD component was also examined.

Method A total of 444 students, ranging in age from 9 to 18 years, completed measures assessing psychopathic traits and externalizing and internalizing problems.

Results Findings indicated expected correlation coefficients between PSCD and its corresponding APSD/YPI-S scores, but APSD CU did not show hypothesized associations with PSCD/YPI-S CU. Overall, PSCD and YPI-S scores showed more expected/consistent correlations with external variables than the APSD. Furthermore, the PSCD GM/CU scores provided incremental contributions over corresponding APSD and YPI-S scores. Finally, the three psychopathic personality components of PSCD offered significant incremental contributions over the PSCD CD subscale in explaining external correlates.

Conclusion Findings highlight the importance for clinicians and researchers to carefully select psychopathy measures, recognizing that outcomes can differ as a function of chosen measures. Furthermore, results encourage future studies to examine the utility of multiple psychopathy components as specifiers for CD. The implications for practice and avenues for future research are explored.

Keywords Psychopathy · Grandiose-manipulative · Callous-unemotional · Daring-impulsive · Conduct Disorder

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From the initial conceptualization by Cleckley (1941–1988), adult psychopathic personality has been consistently described as a constellation of co-occurring interpersonal, affective, behavioral/lifestyle traits, and antisocial trait components (e.g., Hare, 2003). Over the past few decades, the concept of psychopathy has been extended to younger age groups, including adolescence, childhood, and even early childhood to improve our understanding of the etiology and treatment of the condition (see Salekin, 2017). In fact, Forth et al.'s (1990) initial attempt to identify the potential precursor characteristics of adult psychopathic personality in youth with an adapted version of the Psychopathy Checklist-Revised (PCL-R) served as a catalyst for subsequent research on psychopathic features in adolescence and the development of measures to assess child and youth psychopathy, including the Psychopathy Checklist-Youth Version (PCL: YV; Forth et al., 2003), the Antisocial Process Screening Device (APSD; Frick & Hare, 2001), and the Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002). Later, the Child Problematic Traits Inventory (CPTI; Colins et al., 2014a) was developed for very young children. Although each of these scales provides valuable insights into the understanding of psychopathy in childhood, except for the PCL: YV, which assesses a range of antisocial behaviors, other commonly used measures for child and adolescent psychopathy do not include a conduct disorder (CD) component. Including the CD component alongside psychopathic traits can contribute to longitudinal studies that aim to explore personality precursors and their relationship with conduct problems (CP). This also offers significant clinical value by allowing clinicians to tailor interventions based on specific personality styles associated with CP. A prior study suggested that individuals exhibiting grandiose-manipulative (GM) traits may engage in CP due to feelings of arrogance or superiority. On the other hand, individuals with callous-unemotional (CU) traits may be motivated by a lack of guilt or remorse. Furthermore, those with daring-impulsive (DI) traits might demonstrate CPs characterized by a tendency for risk-taking behavior (Salekin et al., 2018).

To address this gap in measurement instrumentation, Salekin and Hare (2016) developed the Proposed Specifiers for Conduct Disorder (PSCD) by integrating findings from research on psychopathy and CD. It includes 24 items loading on three psychopathy components of GM, CU, DI, and CD symptoms. The CD scale within PSCD taps four symptom categories of *ICD-11* and *DSM-5* CD and one category of Oppositional-Defiant Disorder (ODD) symptoms. By incorporating three psychopathic components alongside symptoms of CD, the primary objective of PSCD is to facilitate researchers in evaluating the proposed specifiers for CD (Salekin, 2016a, 2017). Presently, PSCD stands as the sole questionnaire enabling the simultaneous examination of GM, CU, and DI components alongside CD symptoms.

Despite the agreement that psychopathic personality is multifaceted and comprises various features, research on the etiology and subtyping of CD has predominantly focused on the CU component which may potentially introduce bias into research findings (Salekin, 2017). Rather, using multiple psychopathy dimensions alongside CD might be more informative than the CU-only approach (Colins et al., 2023; Elhami Athar, 2023; Bellamy et al., 2024). Numerous studies show that GM, CU, and DI traits can be observed in children at an early age, exhibit relative stability over time, and demonstrate significant correlations with emotional, cognitive, psychosocial, and behavioral variables (e.g., Salekin, 2017; López-Romero et al., 2019). Furthermore, research suggests that the combination of CD with elevated levels of all psychopathic traits provides a stronger prediction of behavioral problems and criminal recidivism and contributes to a better understanding of the etiology

and treatment of CD compared to any individual psychopathic trait in isolation (e.g., Colins et al., 2018; López-Romero et al., 2020; Colins et al., 2023). Given these initial findings, additional research from a multifactorial framework may help us determine more firmly if a greater representation of child and adolescent psychopathic characteristics will advance our knowledge of the etiology, classification, and treatment of various types of children and adolescents with CD (Colins et al., 2022, 2023). Such studies may also contribute to deciding if psychopathy components other than CU traits should be incorporated as specifiers for CD in future revisions of the *DSM* and *ICD* (APA, 2013; WHO, 2018). Indeed, some studies suggest that the *DSM-5'Limited Prosocial Emotion (LPE)* specifier may not always designate a severe subgroup of individuals with CD (Lahey, 2014; Colins et al., 2020). However, despite the initial support for the utility of multiple specifiers for CD (e.g., Colins et al., 2023) and Oppositional Defiant Problems (ODP; Elhami Athar, 2024) it is premature to definitively conclude that these specifiers are essential for future revisions of the *DSM* and *ICD*. Conducting comprehensive evaluations of the utility of these specifiers would be advantageous and contribute to the ongoing discourse on this subject. In the meantime, the PSCD is currently the only measure specifically designed to facilitate research on the utility of multiple psychopathy components as specifiers for externalizing psychopathology, and further research is necessary to examine the validity of PSCD dimension scores in various ways.

First, given that the PSCD, APSD, and YPI-S all measure the psychopathy construct, it is expected that each subscale yields moderate to strong associations with its equivalent subscale in alternative measures of psychopathy, which will provide support for the convergent validity of their scores. In this regard, as the PSCD is a recently developed measure, few studies have examined its associations with alternate measures of psychopathy. For instance, Luo et al. (2021) showed that the PSCD GM, CU, and DI scores were moderate to strongly associated with their corresponding YPI scores (Luo et al., 2021; Colins et al., 2022) and moderately with APSD scores, though the PSCD CU was moderately correlated with YPI CU but weakly with APSD CU (Luo et al., 2021). Likewise, the PSCD total and subscales scores were moderately to strongly associated with their corresponding YPI-S scores (Ribeiro da Silva et al., 2021). Prior studies also showed that the APSD subscales of Narcissism and Impulsivity yielded the expected associations with their corresponding YPI-S subscales scores, while the APSD CU did not demonstrate the hypothesized association with YPI-S CU score (e.g., Colins et al., 2014a; Pechorro et al., 2017; Wang et al., 2017). Overall, these studies suggest that the APSD CU may measure something different from the PSCD and YPI CU subscales, as they did not consistently correlate strongly with each other. More specifically, the APSD CU subscale includes two items assessing ''whether one cares about how well h/she performs at school and workplace''; and ''whether one hides his/her emotions or feelings from others'' which have not been tapped by PSCD and YPI-S CU subscales. Therefore, it is expected that APSD CU would demonstrate different associations with theoretically related external correlates compared to PSCD and YPI-S CU subscales (Elhami Athar et al., 2023). Similarly, while the behavioral dimensions of PSCD, APSD, and YPI-S include items related to impulsivity, the PSCD DI subscale includes items assessing daring behaviors. Consequently, the associations of PSCD DI with theoretically related correlates of interest may differ from its counterpart APSD and YPI-S scores.

Theory and prior research suggest that components of psychopathy measures often demonstrate significant positive correlations with indices of externalizing psychopathol-

ogy such as CD, ODD, aggression, and delinquency (supporting their convergent validity), weak or non-significant relationships with indices of internalizing psychopathology such as anxiety and depression symptoms (e.g., Ebrahimi et al., 2021a, 2022; Colins et al., 2022; Elhami Athar et al., 2023, 2024), and significant negative associations with empathy scores (supporting their discriminant validity; van Dongen, 2020). Nevertheless, a comparative analysis of the correlations between PSCD, APSD, and YPI-S scores and relevant external variables continues to be needed. This is required to examine the associations between psychopathy measures' subscales with external correlates of interest given that they may vary as a function of measure. Such research investigations would contribute to a more comprehensive understanding of the associations between the various psychopathy measures, subscale differentiation, and their relationships with external correlates.

Furthermore, in light of the advantages associated with the multi-measure approach to assessing psychopathy (e.g., Zeier & Newman, 2013), it is important to examine whether the PSCD subscales of GM, CU, and DI provide significant incremental contributions over their corresponding APSD and YPI-S scores in predicting outcome variables. To the best of our knowledge, only one study has examined the incremental contribution of the PSCD scores over YPI scores. In this sole study, Colins et al. (2022) showed that the PSCD total and subscale scores of GM, CU, and DI provided significant added value over their corresponding YPI scores in predicting external correlates of interests such as CD symptoms, reactive proactive aggression, and diminished affective empathy. Similar incremental results were found for the PSCD CD component over the YPI total score. The results from this study are in need of replication with other samples (e.g., school-attending students), while also including other youth psychopathy measures (e.g., YPI-S and APSD). Finally, while it has been proposed that incorporating psychopathic personality components alongside CD could aid in investigating personality and its association with CD (e.g., Salekin, 2016b, 2017; Salekin et al., 2018), empirical studies are warranted to scrutinize whether multiple dimensions of psychopathy offer significant added value over CD alone in explaining theoretically related variables (e.g., proactive aggression and delinquency).

The Current Study

In an attempt to address the aforementioned gaps in the literature, this study was conducted with four aims. First, in order to examine the convergent validity of the PSCD scores, we examined the correlation coefficients of PSCD scores with their corresponding APSD and YPI-S scores. Based on previous research, we anticipated that PSCD GM and DI scores would exhibit moderate to strong associations with their respective APSD and YPI-S scores (Luo et al., 2021; Ribeiro da Silva et al., 2021; Colins et al., 2022), whereas PSCD CU was expected to demonstrate weak to moderate correlation coefficients with APSD CU and YPI-S CU, respectively (Luo et al., 2021). Secondly, our objective was to perform a comparative analysis of the correlation coefficients between PSCD, APSD, and YPI-S scores and relevant external variables. Initially, we utilized Pearson product-moment correlation coefficient analyses to investigate the relationships between psychopathy measure scores and external correlates of interest. While the results of these analyses could aid in examining the convergent (e.g., CD, ODD, delinquency) and discriminant (e.g., anxiety, depression, and empathy) validity of the components of these psychopathy measures, our primary

focus in this analysis was to conduct a comparative assessment of the correlation coefficients between PSCD, APSD, and YPI-S scores and external variables. This is because the associations of psychopathy measures' subscales scores with external correlates of interest may vary depending on the psychopathy measure employed. This area of research remains relatively unexplored and the current analysis was undertaken to help bridge this gap. Third, we tested whether the PSCD subscales of GM, CU, and DI provide significant incremental contributions over their corresponding APSD and YPI-S scores in predicting outcome variables. Based on past research (e.g., Colins et al., 2022), we expected that the PSCD scores would demonstrate incremental validity over the YPI-S scores in relation to criterion variables (e.g., CD and proactive aggression), though, given the lack of prior literature, we did not have solid expectations regarding the incremental validity of the PSCD scores over their corresponding APSD component scores. Finally, we investigated whether the GM, CU, and DI dimensions of psychopathy provide significant incremental value over CD. We expected that the components of psychopathy would add clinical value in the prediction of external correlates over CD alone.

Method

Participants and Procedure

The participants were 444 school-attending youth between 9 and 18 years of age (M=14.29, SD=1.63, 73% boys) in Tehran. Children and their guardians were contacted through a secured online platform and were informed about the aims and the voluntary and confidential character of the study. Then, children and adolescents were recruited online from January 2022 to May 2022 and anonymously completed the questionnaires online in a standardized order using a secured online platform at a time and location of their convenience (due to the COVID-19 pandemic, the schools were closed at the time of the data collection). Participants were not compensated for taking part in the study. All the study procedures were conducted according to ethical standards outlined by the World Medical Association's Declaration of Helsinki and were approved by the Institutional Review Board.

Measures

Proposed Specifiers for Conduct Disorder Scale Self-Report (PSCD-SR; Salekin & Hare, 2016)

The PSCD-SR (Salekin & Hare, 2016) is a 24-item measure developed to assess psychopathic traits in youths and includes four subscales (6 items for each subscale) of Grandiose-Manipulative (GM; e.g., *"Lying is easy for me"*), Callous-Unemotional (CU; e.g., *"I can turn and walk away from someone who is hurt."*), Daring-Impulsive (DI; e.g., *"I like a lot of change or adventure."*), and Conduct Disorder (CD; e.g., *"I have stolen things."*). Items are rated on a 3-point Likert scale (0=*not true*, 1=*sometimes true*, 2=*true*). Previous research involving Iranian adolescent samples supported the hierarchical four-factor model of the Persian PSCD-SR. The total and subscale scores were internally consistent and demonstrated anticipated correlations with theoretically relevant external variables, such

as externalizing problems (CD, ODD) and anxiety/depression scores (Elhami Athar et al., 2023, 2024). The internal consistency indices scores for the PSCD total and subscales score are presented in Table 1.

Antisocial Process Screening Device Self-Report (APSD-SR; Frick & Hare, 2001)

APSD-SR is a self-report measure developed to measure psychopathic traits and antisocial behavior in adolescents. It includes 20 items which are rated on a three-point Likert scale, ranging from 0 (*"no, not true in all cases"*) to 2 (*"certainly true"*). The three-factor model of the APSD includes components of Narcissism (seven items; e.g., *"You tease or make fun of other people."*), Callous-Unemotional (six items; e.g., *"You care about how well you do at school or work."*), and Impulsivity (five items; e.g., *"You blame others for your mistakes."*). Two items (items two and six) are only used to calculate the total score (Frick & Hare, 2001). The sum of these 20 items yields a total score for the APSD. Previous research in Iran (Ebrahimi et al., 2021a) demonstrated that the APSD-SR total and dimension scores

Table 1 Mean and standard deviation scores for the study variables in the total sample (n=444)

Measures	Mean	SD	Minimum	Maximum	Skewness	Kurtosis	ω	α	MIC
PSCD-SR Total	10.62	5.43	0.00	31.00	0.92	0.94	0.78	0.78	0.16
GM	1.25	1.45	0.00	8.00	1.40	2.16	0.62	0.60	0.31
CU	2.57	2.03	0.00	11.00	1.21	1.94	0.55	0.55	0.18
DI	5.43	2.06	0.00	10.00	−0.17	−0.23	0.52	0.51	0.17
CD	1.36	1.88	0.00	10.00	1.66	2.42	0.71	0.69	0.29
APSD-SR Total	8.63	5.09	0.00	28.00	0.77	0.33	0.79	0.79	0.17
NAR	3.08	2.35	0.00	12.00	0.92	0.69	0.67	0.67	0.24
CU	2.01	1.82	0.00	10.00	1.28	2.26	0.61	0.60	0.22
IMP	3.17	2.02	0.00	9.00	0.37	−0.37	0.63	0.62	0.25
YPI-S Total	29.33	6.66	17.00	59.00	0.89	1.12	0.71	0.76	0.18
GM	7.72	2.67	5.00	20.00	1.73	3.61	0.74	0.73	0.41
CU	11.38	3.19	6.00	22.00	0.59	0.14	0.56	0.56	0.17
II	10.24	3.17	6.00	21.00	0.84	0.64	0.74	0.72	0.31
YSR Social Problems	4.49	3.41	0.00	20.00	1.12	1.53	0.75	0.74	0.22
YSR Affective Problems	5.00	4.86	0.00	26.00	1.41	2.12	0.85	0.84	0.29
YSR Anxiety Problems	2.59	2.12	0.00	11.00	1.15	1.28	0.72	0.71	0.33
YSR ADHD Problems	4.16	2.58	0.00	14.00	0.95	1.10	0.70	0.68	0.23
YSR ODD Problems	1.51	1.96	0.00	10.00	1.54	2.39	0.78	0.77	0.40
YSR CD Problems	1.73	2.72	0.00	28.00	3.84	24.48	0.80	0.80	0.26
Delinquency	25.94	6.52	24.00	110.00	8.73	95.54	0.85	0.86	0.24
Proactive Aggression	1.47	2.51	0.00	17.00	2.73	9.02	0.83	0.83	0.32
Relational Aggression	4.47	4.08	0.00	23.00	1.41	2.46	0.78	0.77	0.40
School Performance	8.06	1.80	1.00	10.00	-1.00	0.91	0.72	0.62	0.24
Trait Anxiety	37.93	11.76	20.00	76.00	0.86	0.54	0.92	0.92	0.36
Cognitive Empathy	33.16	5.71	15.00	45.00	0.09	−0.19	0.79	0.79	0.29
Affective Empathy	35.27	6.69	11.00	55.00	−0.20	0.54	0.71	0.72	0.19

Note. *M*=Mean; *SD*=Standard deviation; *PSCD-SR*=Proposed Specifiers for Conduct Disorder Self-Report; *GM*=Grandiose-Manipulative; *CU*=Callous-Unemotional; *DI*=Daring-Impulsive; *CD*=Conduct Disorder; *APSD-SR*=Antisocial Process Screening Device - Self-Report; *NAR*=Narcissism; *IMP*=Impulsivity; *YPI-S*=Youth Psychopathic Traits Inventory-Short Version; *II*=Impulsive-Irresponsible; *ω*=McDonald's Omega; *α*=Crobach's Alpha; *MIC*=Mean Inter-Item Correlation

exhibited anticipated correlations with relevant external variables (e.g., conduct problems, aggression, and low prosocial behavior), lending support to the valid interpretation of APSD scores. Apart from the APSD-SR Impulsivity subscale, the other APSD-SR scores demonstrated satisfactory internal consistency. Nevertheless, as shown in Table 1, the internal consistency indices scores for the APSD total and subscales score were satisfactory at least when considering mean inter-item correlation as the indicator of internal consistency.

The Youth Psychopathic Traits Inventory– Short Form (YPI-S; van Baardewijk et al., 2010)

The YPI-S is the shortened version of the original YPI and includes 18 items, which are rated on a scale from 1 (*"does not apply at all"*) to 4 (*"applies very well"*) and load on subscales of GM, CU, and II (Six items for each subscale). Items are summed to yield three subscale scores and a total score, with higher scores showing higher levels of psychopathic characteristics. In a previous study validating the Persian YPI-S, Ebrahimi et al. (2022) demonstrated that the YPI-S total and subscale scores exhibited anticipated correlations with relevant external variables (e.g., aggression, hyperactivity, and conduct problems), lending support to the valid interpretation of YPI-S scores. Although some YPI-S scores showed unsatisfactory internal consistency in Ebrahimi et al.'s (2022) study, another research study with an Iranian sample (Elhami Athar, 2023) found strong internal consistency for the YPI-S total and subscale scores. The internal consistency indices for the YPI-S total and subscale scores are presented in Table 1.

Youth Self-Report (Achenbach & Rescorla, 2001)

The Persian Youth Self-Report (YSR; Achenbach & Rescorla, 2001) consists of 113 items referring to behavioral and emotional problems during the past six months. These items must be answered on a 3-point scale ranging from 0 (*"not at all"*) to 2 (*"often"*). Since 2001, the YSR has had six DSM scales that are based on the international experts' judgments about the extent to which YSR items correspond with DSM symptoms. For the purpose of the present study, we focused on the Conduct Problem scale, which covers symptoms of CD (15 items; e.g., *"I destroy things that belong to others"*); the Oppositional Defiant Problems scale, which covers symptoms of ODD (5 items; e.g., *"I argue a lot"*); the Attention-Deficit/Hyperactivity Problems scale, which covers symptoms of ADHD (7 items; e.g., *"I fail to finish things that I start"*); the Affective Problems scale, which covers symptoms of major depressive disorder and dysthymia (13 items; e.g., *"There is very little that I enjoy"*); and the Anxiety Problems Scale which, covers symptoms of generalized anxiety disorder, separation anxiety disorder, and specific phobias (6 items; e.g., *"I worry a lot"*). In addition, we also used the YSR narrow-band scale "Social Problems" (11 items; e.g., *"I feel lonely"*). In line with prior studies with Iranian samples (e.g., Elhami Athar et al., 2023), in the present study, raw, continuous DSM scale scores were obtained by summing the responses of each item with the DSM-oriented or narrow-band scale. Studies with Iranian adolescent samples have demonstrated that the Persian YSR scores showed satisfactory internal consistency and correlated as expected with alternative measures of externalizing and internalizing psychopathology (e.g., Minaee, 2006). The internal consistency indices scores for the YSR subscales score are presented in Table 1.

The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006)

The BES is a self-report measure designed to evaluate empathy in adolescents. The BES includes 20 items scored on a five-point Likert scale ranging from 1 (*"Strongly disagree"*) to 5 (*"Strongly agree"*) and load on two subscales of affective empathy (11 items; e.g., *"My friend's emotions don't affect me much"*) and cognitive empathy (nine items; e.g., *"I can understand my friend's happiness when shehe does well at something"*). Items scores are added together to form scores of affective or cognitive empathy while also producing an overall total empathy score. Jafari et al. (2017) reported acceptable internal consistency and test-retest reliability coefficients for the affective and cognitive components of the Persian BES. Furthermore, both BES subscales exhibited anticipated significant negative correlations with measures of aggression and peer problems, lending support to the valid interpretation of BES subscale scores. The internal consistency indices scores for the BES affective and cognitive empathy scores are presented in Table 1.

Reactive–Proactive Aggression Questionnaire (RPQ; Raine et al., 2006)

The RPQ is a self-report tool with 23 items that assesses reactive and proactive aggression among youths. The proactive subscale of the RPQ includes 12 items (e.g., *"Vandalized something for fun"*) rated on a 3-point Likert scale ranging from 0 (*"Never"*) to 2 (*"Often"*). The sum of the 12 items' scores yields a score of proactive aggression, with higher scores indicating higher levels of proactive aggression. The proactive aggression subscale of the Persian RPQ showed good internal consistency scores and yielded the expected correlations with indices of externalizing problems and psychopathic traits (Elhami Athar et al., 2024). The internal consistency indices scores for the RPQ score are presented in Table 1.

The Self-Report Delinquency Scale (SRD; Elliott & Ageton, 1980)

The SRD was developed for the original National Youth Survey (NYS), aiming to include items tapping the full range of acts for which juveniles could be arrested and involved a recall period of one year. In line with the majority of studies, we used the shorter general delinquency scale which includes the total SRD score by summing up the 24 items (e.g., *"taken a vehicle for a ride (drive) without the owner's permission"*) rated on a 9-point ordinal scale ranging from 1 (*"Never"*) to 9 (*"Two-Three times a day"*). Higher scores indicate higher juvenile delinquency levels. The internal consistency indices scores for the SRD score are presented in Table 1.

The Spielberger State-Trait Anxiety Inventory (STAI; Spielberger, 1983)

The STAI is a 40-item measure developed by Spielberger (1983) to measure state and trait anxiety, with 20 items for each type of anxiety. In this study, we administered only the items assessing trait anxiety to assess the frequency of anxiety feelings in general. The participants completed 20 items (*e.g., "I feel nervous and restless"*) on a Likert-type scale ranging from 1 (*"almost never"*) to 4 (*"almost always"*), with higher scores indicating the presence of higher levels of anxiety. Panahi Shahri (1993) conducted the translation and validation of the Persian STAI in Iran. The STAI scores exhibited strong correlations with an alternative

anxiety measure and demonstrated satisfactory internal consistency. The internal consistency indices scores for the trait anxiety score are presented in Table 1.

Relational Aggression Subscale (Loudin et al., 2003)

Relational Aggression Subscale (RAS; Loudin et al., 2003) is a self-report measure with 7 items [1] (e.g., *"When angry or mad at a peer how likely are you to try to retaliate by excluding him/her from group activities?"*) rated on a Likert scale ranging from 1 (*"not at all likely"*) to 5 (*"very likely"*). The items' scores are summed to yield a total score of relational aggression. The RAS was translated into Persian and administered in this study. The internal consistency indices score for the RAS score is presented in Table 1.

School Performance (Elhami Athar et al., 2023)

In line with Elhami Athar et al. (2023), a set of questions was used to briefly inquire about the child's (i) attitude toward education (*''Do you think that school and education are important ?''*; *No*=0; *Yes*=1); (ii) investment in education (*''Do you try to do your best in school as well as when doing schoolwork at home ?''*; *never*=0; *sometimes*=1; *always*=2); (iii) repetition of grades (*''Have you ever repeated any grades ?''*; *no*=1; *yes*=0); (iv) current academic performance (*''How do you evaluate your own current academic performance ?''*; *weak*=0; *normal*=1; *good*=2; *excellent*=3); and (v) past academic performance (*''How do you evaluate your own overall past academic performance ?''*; *weak*=0; *normal*=1; *good*=2; *excellent*=3). The variables were first transformed into Z-scores and were then summed up to create an omnibus variable, "school performance," with higher scores reflecting better school performance. The internal consistency indices scores for the school performance score are presented in Table 1.

Data Analyses

We first examined the descriptive statistics for the study variables, including the mean, standard deviation, skewness, kurtosis, and internal consistency indices. Skewness values between −3 and +3 and kurtosis values between −10 and +10 are considered acceptable for indicating normal distribution (Brown, 2006). Internal consistency of the measures was evaluated using three different indices: Cronbach's alpha ($\alpha \geq 0.70$ considered acceptable; Cheung & Rensvold, 2002), McDonald's omega ($\omega \geq 0.70$ considered acceptable; Dunn et al., 2014), and Mean Inter-Item Correlations (MIC; $0.15 \leq MICs \leq 0.50$ considered adequate; Clark & Watson, 1995). Next, we conducted Pearson product-moment correlation coefficients between the three psychopathy measure scores and with external correlates of interests which were interpreted as ≤0.30=small; 0.30-0.50=medium; and ≥0.50=strong effect sizes (Cohen, 2013). Additionally, we conducted Williams's test (Williams, 1959) to explore whether the correlations of psychopathy component scores with external correlates of interest differed significantly across the measures. Williams's test is a statistical method used to compare the difference between two non-independent correlation coefficients that share

[1] Item 7 (i.e., *"When angry or mad at a same-sex peer, how likely are you to try and steal that person's dating partner to get back at them?"*) was omitted from the present study due to its cultural irrelevance within the Iranian context. Consequently, only 6 items of the RAS were administered in this study.

a common variable. Specifically, it tests whether the difference between two correlation coefficients involving the same variable is significant. To examine the added value of the PSCD scores over their corresponding APSD and YPI-S scores in predicting external variables (including CP, delinquency, proactive aggression, relational aggression, and school performance), we performed a series of hierarchical multiple regression analyses. More specifically, we entered an APSD and YPI-S subscale in the first blocks of the regressions followed by its corresponding PSCD score in the second blocks. Next, we were interested in examining the incremental contribution of the three psychopathic trait components of the PSCD over its CD subscale. To this end, we included the PSCD CD component in the first blocks of the regressions, while the three subscales of PSCD were added to the second blocks. A significant change in R^2 from block 1 to block 2 was interpreted as support for the incremental validity. All analyses were conducted in SPSS 20 and with $p < .05$ as an indicator of statistical significance.

Results

Descriptive Statistics

Descriptive statistics were conducted for all study variables and are presented in Table 1. The skewness (-0.17 to 1.73) and kurtosis values (-0.37 to 3.66) for the scores of the three psychopathy measures indicated that they followed a normal distribution. Additionally, Table 1 shows that the total and subscales scores of all three psychopathy measures demonstrated satisfactory levels of internal consistency, at least when relying on the MIC.

Correlational Analyses

Correlation Coefficients of PSCD with APSD and YPI-S Scores

As shown in Table 2, the PSCD total score was strongly associated with the APSD and YPI-S total scores (r's = 0.71 and 0.66, respectively). In terms of the PSCD subscale scores, the PSCD GM subscale yielded strong correlation coefficients with the APSD Narcissism and YPI-S GM scores (r's = 0.59 and 0.58, respectively), while the PSCD CU subscale demonstrated a weak association with APSD CU ($r = 0.26$) and a moderate relation with YPI-S CU ($r = 0.39$) subscale scores. Our results also showed that the PSCD DI subscale was strongly correlated with APSD Impulsivity ($r = 0.57$) and moderately with YPI-S II ($r = 0.44$) subscales. Finally, the PSCD CD subscale yielded a strong correlation with the PSCD total score ($r = 0.75$) but moderate correlations with the PSCD subscales of GM, CU, and DI (r's = 0.36 to 0.43). The PSCD CD subscale was also strongly correlated with APSD total and subscales of Narcissism and Impulsivity (r's = 0.53 to 0.64) but moderately with APSD CU subscale ($r = 0.32$). Likewise, the PSCD CD subscale yielded strong correlations with YPI-S total and II subscale (r's = 0.51 and 0.53, respectively), though it was weak to moderately associated with YPI-S CU and GM subscales (r's = 0.23 and 0.36, respectively). Overall, the PSCD demonstrated no convergent discriminant correlation coefficient violations whereas the APSD and YPI-S had one violation with the CU scales, where for example

Table 2 Pearson correlation coefficients between PSCD-SR, APSD-SR, and YPI-S scores and with external self-reported variables of interest for school attending youth ($n = 444$)

Variables	PSCD-SR					APSD-SR				YPI-S		
	Total	GM	CU	DI	CD	Total	NAR	CU	IMP	Total	GM	CU
PSCD-SR Total	-	-	-	-	-	-	-	-	-	-	-	-
GM	0.69**	-	-	-	-	-	-	-	-	-	-	-
CU	0.75**	0.39**	-	-	-	-	-	-	-	-	-	-
DI	0.72**	0.33**	0.34**	-	-	-	-	-	-	-	-	-
CD	0.75**	0.43**	0.41**	0.36**	-	-	-	-	-	-	-	-
APSD-SR Total	0.71**	0.56**	0.49**	0.42**	0.64**	-	-	-	-	-	-	-
NAR	0.64**	0.59**	0.46**	0.34**	0.53**	0.84**	-	-	-	-	-	-
CU	0.28**	0.21**	0.26**	0.04	0.32**	0.60**	0.25**	-	-	-	-	-
IMP	0.62**	0.35**	0.34**	0.57**	0.53**	0.77**	0.53**	0.20**	-	-	-	-
YPI-S Total	0.66**	0.49**	0.53**	0.40**	0.51**	0.65**	0.63**	0.18**	0.56**	-	-	-
GM	0.52**	0.58**	0.41**	0.23**	0.36**	0.51**	0.63**	0.11*	0.28**	0.68**	-	-
CU	0.35**	0.18**	0.39**	0.21**	0.23**	0.29**	0.29**	0.08	0.25**	0.76**	0.28**	-
II	0.59**	0.37**	0.38**	0.44**	0.53**	0.64**	0.52**	0.20**	0.68**	0.76**	0.29**	0.36**

Note. *PSCD-SR* = Proposed Specifiers for Conduct Disorder Self-Report; *GM* = Grandiose-Manipulative; *CU* = Callous-Unemotional; *DI* = Daring-Impulsive; *CD* = Conduct Disorder; *APSD-SR* = Antisocial Process Screening Device - Self-Report; *NAR* = Narcissism; *IMP* = Impulsivity; *YPI-S* = Youth Psychopathic Traits Inventory-Short Version; *II* = Impulsive-Irresponsible; * $p < .05$; ** $p < .001$

the CU scale of the APSD correlated more highly with noncorresponding subscales (i.e., GM and II of the YPI-S).

Correlation Coefficients of PSCD, APSD, and YPI-S Scores with External Correlates

Table 3 shows that the PSCD and YPI-S GM subscales were weak to moderately correlated with social problems (*r's* = 0.27 and 0.33, respectively), though the magnitude of the correlation was stronger for the APSD Narcissism (*r* = 0.48). The PSCD and YPI-S GM subscales yielded the expected weak correlations with affective and anxiety problems and trait anxiety (*r's* = 0.11 to 0.26), while the APSD Narcissism demonstrated higher correlations with the latter (*r's* = 0.32 to 0.40). In the same vein, the PSCD and YPI-S GM subscales were at best moderately correlated with ADHD, ODD, and CD problems and proactive aggression (*r's* = 0.26 to 0.38), while the APSD Narcissism yielded relatively stronger associations with the them (*r's* = 0.43 to 0.49). While the PSCD GM, YPI-S GM, and APSD Narcissism demonstrated weak associations with delinquency, only the APSD Narcissism yielded a strong correlation with relational aggression (*r* = 0.51) and a significant negative association with school performance (*r* = −0.17). Finally, PSCD GM, YPI-S GM, and APSD Narcissism scores were negatively associated with cognitive and affective empathy (*r's* = −0.10 to −0.16), though with one exception: the YPI-S GM was not significantly correlated with cognitive empathy (Table 3).

In terms of the CU subscale, across the three measures, it was weak to moderately associated with social problems (*r's* = 0.21 to 0.33) and weakly with affective and anxiety problems and trait anxiety, but with one exception: the APSD CU subscale was moderately correlated with trait anxiety (*r* = 0.42). The PSCD CU subscale was moderately associated with ADHD, ODD, and CD problems, though the correlations were in the weak to moderate ranges for the APSD and YPI-S CU subscales. Also, the CU subscale demonstrated weak correlation coefficients with delinquency, proactive aggression, and relational aggression across the measures but with two exceptions: The PSCD CU subscale was moderately correlated with proactive and relational aggression (*r's* = 0.31 and 0.33, respectively). Across the measures, the CU subscale was negatively and significantly associated with higher school performance, though the magnitude of these correlations was higher for the APSD CU subscale (*r* = −0.44). Likewise, across the measures, the CU scores were significantly and negatively correlated with cognitive and affective empathy. However, while it is expected that the CU scores yield stronger correlation coefficients with affective empathy than cognitive empathy, this was the case only with the PSCD and YPI-S CU subscale, where this expected convergent and discriminant validity was evidenced (Table 3).

In terms of the CU subscale, across the three measures, it was weak to moderately associated with social problems (*r's* = 0.21 to 0.33) and weakly with affective and anxiety problems and trait anxiety, but with one exception: the APSD CU subscale was moderately correlated with trait anxiety (*r* = 0.42). The PSCD CU subscale was moderately associated with ADHD, ODD, and CD problems, though the correlations were in the weak to moderate ranges for the APSD and YPI-S CU subscales. Also, the CU subscale demonstrated weak correlation coefficients with delinquency, proactive aggression, and relational aggression across the measures but with two exceptions: The PSCD CU subscale was moderately correlated with proactive and relational aggression (*r's* = 0.31 and 0.33, respectively). Across the measures, the CU subscale was negatively and significantly associated with higher school

Table 3 Pearson correlation coefficients of PSCD-SR, APSD-SR, and YPI-S scores with external self-reported variables of interests ($n=444$)

Variables	PSCD-SR					APSD-SR				YPI-S			
	Total	GM	CU	DI	CD	Total	NAR	CU	IMP	Total	GM	CU	II
YSR Social Problems	0.48**	0.27**	0.33**	0.33**	0.47**	0.56** [a]	0.48** [b]	0.21** [a]	0.53** [b]	0.50**	0.33**	0.25**	0.53** [b]
YSR Affective Problems	0.46**	0.26**	0.29**	0.32**	0.46**	0.53** [a]	0.40** [b]	0.24**	0.52** [b]	0.47**	0.25**	0.27**	0.50** [b]
YSR Anxiety Problems	0.27**	0.11*	0.15**	0.19**	0.33**	0.40** [b]	0.32** [b]	0.13**	0.39** [b]	0.34**	0.16**	0.15**	0.42** [b]
YSR ADHD Problems	0.47**	0.30**	0.31**	0.33**	0.44**	0.53** [a]	0.43** [b]	0.16** [a]	0.55** [b]	0.46**	0.26**	0.18**	0.56** [b]
YSR ODD Problems	0.54**	0.31**	0.34**	0.34**	0.57**	0.60** [a]	0.49** [b]	0.28** [a]	0.55** [b]	0.50**	0.30**	0.23**	0.56** [b]
YSR CD Problems	0.49**	0.32**	0.35**	0.26**	0.52**	0.56** [a]	0.46** [b]	0.32**	0.42** [b]	0.52**	0.35**	0.33**	0.46** [b]
Delinquency	0.34**	0.25**	0.24**	0.14**	0.37**	0.33**	0.28**	0.25**	0.18**	0.34**	0.28**	0.22**	0.26** [a]
Proactive Aggression	0.48**	0.38**	0.31**	0.24**	0.51**	0.53**	0.46** [b]	0.27**	0.41** [b]	0.46**	0.31** [a]	0.27**	0.44** [b]
Relational Aggression	0.45**	0.36**	0.33**	0.19**	0.46**	0.55** [b]	0.51** [b]	0.26**	0.39** [b]	0.40**	0.34**	0.17** [b]	0.40** [b]
School Performance	−0.27**	−0.09	−0.16**	−0.17**	−0.35**	−0.40** [b]	−0.17**	−0.44** [b]	−0.32** [b]	−0.23**	0.01	−0.12**	−0.34** [b]
Trait Anxiety	0.37**	0.22**	0.21**	0.23**	0.42**	0.56** [b]	0.36** [b]	0.42** [b]	0.49** [b]	0.33**	0.15**	0.12*	0.46** [b]
Cognitive Empathy	−0.13**	−0.10*	−0.13**	−0.05	−0.14**	−0.29** [b]	−0.16**	−0.38** [b]	−0.15** [a]	−0.17**	0.00	−0.12*	−0.25** [b]
Affective Empathy	−0.15**	−0.11*	−0.33**	0.00	−0.10*	−0.17**	−0.12*	−0.29**	0.00	−0.17**	−0.14**	−0.24** [b]	0.00

Note. *PSCD-SR*=Proposed Specifiers for Conduct Disorder Self-Report; *GM*=Grandiose-Manipulative; *CU*=Callous-Unemotional; *DI*=Daring-Impulsive; *CD*=Conduct Disorder; *APSD-SR*=Antisocial Process Screening Device - Self-Report; *NAR*=Narcissism; *IMP*=Impulsivity; *YPI-S*=Youth Psychopathic Traits Inventory-Short Version; *II*=Impulsive-Irresponsible; Williams' test was used to examine differences between PSCD-SR scores and their corresponding APSD-SR and YPI-S scores in their correlations with external correlates with significance levels denoted as follows: [a] = Williams' test $p<.05$; [b] = Williams' test $p<.001$. However, due to space limitations and to maintain the clarity and readability of the presentation, the results of these tests are solely reported in the Table but neither reported nor discussed across the text

performance, though the magnitude of these correlations was higher for the APSD CU subscale ($r=-0.44$). Likewise, across the measures, the CU scores were significantly and negatively correlated with cognitive and affective empathy. However, while it is expected that the CU scores yield stronger correlation coefficients with affective empathy than cognitive empathy, this was the case only with the PSCD and YPI-S CU subscale, where this expected convergent and discriminant validity was evidenced (Table 3).

Furthermore, as shown in Table 3, our results were indicative of significant weak to moderate correlations between PSCD DI subscale and social, affective, and anxiety problems and trait anxiety (r's$=0.19$ to 0.33), while the correlations ranged from moderate to strong ranges for the APSD Impulsivity and YPI-S II scores (r's$=0.39$ to 0.53). In addition, the PSCD DI subscale demonstrated weak to moderate associations with ADHD, ODD, and CD problems, delinquency, and relational/proactive aggression (r's$=0.14$ to 0.34), though the correlations were in the moderate to strong ranges for the APSD Impulsivity and YPI-S II scores (r's$=0.39$ to 0.56) with two exceptions: the APSD Impulsivity and YPI-S II scores yielded weak correlations with delinquency. While the PSCD DI, APSD Impulsivity, and YPI-S II subscales were negatively and significantly correlated with higher school performance, the range of correlations was stronger for the APSD Impulsivity and YPI-S II (r's$=-0.32$ and -0.34, respectively) than the PSCD DI ($r=-0.17$). Finally, only the APSD Impulsivity and YPI-S II scores were negatively and significantly associated with cognitive empathy (r's$=-0.15$ and -0.25, respectively), while they were not significantly correlated to affective empathy, as was the case with the PSCD DI subscale (Table 3).

Incremental Validity Results

Incremental Value of the PSCD Subscales Scores over Their Corresponding APSD and YPI-S Scores

As shown in Table 4, the PSCD GM provided significant additive value in predicting proactive aggression ($\Delta R^2=0.019$, $p=<0.001$) and delinquency ($\Delta R^2=0.011$, $p=<0.05$) over the APSD Narcissism. In the same vein, the PSCD CU subscale provided a significant incremental contribution over the APSD CU in explaining CD problems ($\Delta R^2=0.078$, $p=<0.001$), proactive aggression ($\Delta R^2=0.065$, $p=<0.001$), delinquency ($\Delta R^2=0.033$, $p=<0.001$), and relational aggression ($\Delta R^2=0.071$, $p=<0.001$). In contrast, the PSCD DI subscale did not provide significant incremental value over the APSD Impulsivity in explaining external correlates.

In addition, the PSCD GM and CU subscales provided significant incremental contributions over their corresponding YPI-S GM and CU subscales in predicting CD problems, proactive aggression, delinquency, relational aggression, and school performance (ΔR^2's$=0.010$ to 0.080, p's$=<0.001$ to <0.05). However, the PSCD DI subscale failed to provide significant added value over the YPI-S II subscale in explaining the external correlates of interests. The standardized betas for each predictor in block 1 and block 2, the direction of the association between the predictors and criterion variables, and the R^2 for each block can be retrieved from Table 5.

Table 4 Hierarchical regression analyses to test the incremental validity of PSCD-SR scores over their counterpart APSD-SR subscales scores in predicting external correlates ($n = 444$)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	*B*	*SE*	*β*	*p*	R^2	ΔR^2	*F*	*F-Change*
Conduct Problems	1	APSD-Narcissism	0.535	0.049	0.462	<0.001	0.213		119.67**	
	2	APSD-Narcissism	0.482	0.061	0.416	<0.001	0.217	0.004	61.074**	2.164
		PSCD-SR GM	0.145	0.108	0.077	0.142				
	1	APSD-CU	0.476	0.067	0.319	<0.001	0.102		50.220**	
	2	APSD-CU	0.365	0.067	0.245	<0.001	0.180	0.078	48.557**	42.211**
		PSCD-SR CU	0.387	0.060	0.290	<0.001				
	1	APSD-Impulsivity	0.562	0.058	0.418	<0.001	0.175		93.708**	
	2	APSD-Impulsivity	0.544	0.071	0.405	<0.001	0.175	0.000	46.871**	0.203
		PSCD-SR DI	0.031	0.070	0.024	0.653				
Proactive Aggression	1	APSD-Narcissism	0.490	0.045	0.457	<0.001	0.209		116.793**	
	2	APSD-Narcissism	0.381	0.056	0.355	<0.001	0.228	0.019	65.183**	10.944**
		PSCD-SR GM	0.298	0.090	0.172	0.001				
	1	APSD-CU	0.366	0.063	0.265	<0.001	0.070		33.417**	
	2	APSD-CU	0.272	0.063	0.197	<0.001	0.135	0.065	34.369**	32.909**
		PSCD-SR CU	0.325	0.057	0.263	<0.001				
	1	APSD-Impulsivity	0.507	0.054	0.408	<0.001	0.167		88.391**	
	2	APSD-Impulsivity	0.504	0.066	0.405	<0.001	0.167	0.000	44.102**	0.011
		PSCD-SR DI	0.007	0.065	0.006	0.917				

Table 4 (continued)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	*B*	*SE*	*β*	*p*	R^2	ΔR^2	*F*	*F-Change*
Delinquency	1	APSD-Narcissism	0.790	0.127	0.284	<0.001	0.081		38.895**	
	2	APSD-Narcissism	0.577	0.157	0.208	<0.001	0.092	0.011	22.280**	5.286*
		PSCD-SR GM	0.584	0.254	0.130	0.022				
	1	APSD-CU	0.896	0.165	0.251	<0.001	0.063		29.624**	
	2	APSD-CU	0.724	0.168	0.202	<0.001	0.095	0.033	23.251**	15.882**
		PSCD-SR CU	0.599	0.150	0.187	<0.001				
	1	APSD-Impulsivity	0.581	0.151	0.180	<0.001	0.033		14.854**	
	2	APSD-Impulsivity	0.479	0.184	0.148	<0.001	0.035	0.002	7.897**	0.943
		PSCD-SR DI	0.175	0.181	0.055	0.332				
Relational Aggression	1	APSD-Narcissism	0.881	0.071	0.506	<0.001	0.256		152.480**	
	2	APSD-Narcissism	0.248	0.143	0.088	<0.001	0.262	0.005	78.079**	2.991
		PSCD-SR GM	0.248	0.143	0.088	0.084				
	1	APSD-CU	0.590	0.103	0.263	<0.001	0.069		32.975**	
	2	APSD-CU	0.553	0.092	0.276	<0.001	0.140	0.071	35.983**	36.352**
		PSCD-SR CU	0.553	0.092	0.276	<0.001				
	1	APSD-Impulsivity	0.788	0.088	0.391	<0.001	0.153		79.547**	
	2	APSD-Impulsivity	0.850	0.108	0.421	<0.001	0.154	0.002	40.272**	0.998
		PSCD-SR DI	−0.106	0.106	−0.053	0.318				

Table 4 (continued)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	*B*	*SE*	*β*	*p*	R^2	ΔR^2	*F*	*F-Change*
School Performance	1	APSD-Narcissism	−0.225	0.062	−0.169	< 0.001	0.029		13.033**	
	2	APSD-Narcissism	−0.237	0.078	−0.178	< 0.001	0.029	0.000	6.534**	0.062
		PSCD-SR GM	0.031	0.126	0.015	0.804				
	1	APSD-CU	−0.759	0.073	−0.443	< 0.001	0.196		107.839**	
	2	APSD-CU	−0.739	0.076	−0.432	< 0.001	0.198	0.002	54.415**	0.992
		PSCD-SR CU	−0.068	0.068	−0.044	0.320				
	1	APSD-Impulsivity	−0.490	0.070	−0.317	< 0.001	0.101		49.544**	
	2	APSD-Impulsivity	−0.502	0.085	−0.325	< 0.001	0.101	0.000	24.746**	0.054
		PSCD-SR DI	0.019	0.083	0.013	0.816				

Note. *PSCD-SR* = Proposed Specifiers for Conduct Disorder Self-Report; *GM* = Grandiose-Manipulative; *CU* = Callous-Unemotional; *DI* = Daring-Impulsive; *CD* = Conduct Disorder; *APSD* = Antisocial Process Screening Device; * $p < .05$; ** $p < .001$

Table 5 Hierarchical regression analyses to test the incremental validity of PSCD-SR Scores over their counterpart YPI-S subscales scores in predicting external correlates ($n=444$)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	B	SE	β	*p*	R^2	ΔR^2	F	F-Change
Conduct Problems	1	YPI-S GM	0.355	0.045	0.349	< 0.001	0.121		61.130**	
	2	YPI-S GM	0.247	0.055	0.243	< 0.001	0.144	0.022	37.059**	11.532**
		PSCD-SR GM	0.344	0.101	0.183	< 0.001				
	1	YPI-S CU	0.282	0.038	0.331	< 0.001	0.109		54.288**	
	2	YPI-S CU	0.194	0.040	0.228	< 0.001	0.169	0.059	44.700**	31.380**
		PSCD-SR CU	0.353	0.063	0.264	< 0.001				
	1	YPI-S-II	0.392	0.036	0.457	< 0.001	0.209		116.659**	
	2	YPI-S-II	0.366	0.040	0.427	< 0.001	0.213	0.004	59.590**	2.203
		PSCD-SR DI	0.092	0.062	0.070	0.055				
Proactive Aggression	1	YPI-S GM	0.295	0.043	0.313	< 0.001	0.098		47.937**	
	2	YPI-S GM	0.130	0.050	0.138	0.010	0.159	0.061	41.669**	32.036**
		PSCD-SR GM	0.526	0.093	0.303	< 0.001				
	1	YPI-S CU	0.209	0.036	0.266	< 0.001	0.071		33.592**	
	2	YPI-S CU	0.133	0.038	0.169	< 0.001	0.123	0.052	30.852**	26.197**
		PSCD-SR CU	0.306	0.060	0.248	< 0.001				
	1	YPI-S-II	0.353	0.034	0.445	< 0.001	0.198		109.120**	
		YPI-S-II	0.334	0.038	0.421	< 0.001	0.200	0.002	55.247**	1.301
	2	PSCD-SR DI	0.066	0.058	0.054	0.255				

Table 5 (continued)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	B	SE	β	*p*	R^2	ΔR^2	F	F-Change
Delinquency	1	YPI-S GM	0.677	0.112	0.277	< 0.001	0.077		36.710**	
	2	YPI-S GM	0.481	0.136	0.197	< 0.001	0.090	0.013	21.688**	6.232*
		PSCD-SR GM	0.626	0.251	0.139	0.013				
	1	YPI-S CU	0.444	0.095	0.217	< 0.001	0.047		21.945**	
	2	YPI-S CU	0.299	0.102	0.147	0.003	0.075	0.028	17.967**	13.374**
		PSCD-SR CU	0.583	0.159	0.182	< 0.001				
	1	YPI-S-II	0.544	0.094	0.264	< 0.001	0.070		33.211**	
	2	YPI-S-II	0.516	0.105	0.251	< 0.001	0.071	0.001	16.769**	0.374
		PSCD-SR DI	0.099	0.161	0.031	0.541				
Relational Aggression	1	YPI-S GM	0.515	0.069	0.337	< 0.001	0.113		56.493**	
	2	YPI-S GM	0.299	0.082	0.195	< 0.001	0.153	0.040	39.852**	20.693**
		PSCD-SR GM	0.689	0.151	0.244	< 0.001				
	1	YPI-S CU	0.211	0.060	0.165	< 0.001	0.027		12.397**	
	2	YPI-S CU	0.058	0.062	0.045	0.356	0.107	0.080	26.550**	39.619**
		PSCD-SR CU	0.617	0.098	0.308	< 0.001				
	1	YPI-S-II	0.516	0.056	0.401	< 0.001	0.160		84.461**	
	2	YPI-S-II	0.506	0.062	0.393	< 0.001	0.161	0.000	42.204**	0.116
		PSCD-SR DI	0.033	0.096	0.017	0.733				

Table 5 (continued)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	B	SE	β	*p*	R^2	ΔR^2	F	F-Change
School Performance	1	YPI-S GM	−0.016	0.056	−0.014	0.773	0.000		0.083	
	2	YPI-S GM	0.068	0.068	0.058	0.315	0.011	0.010	2.349	4.613*
		PSCD-SR GM	−0.269	0.125	−0.125	0.032				
	1	YPI-S CU	−0.121	0.046	−0.124	0.009	0.015		6.888*	
	2	YPI-S CU	−0.073	0.050	−0.075	0.144	0.029	0.013	6.548*	6.128*
		PSCD-SR CU	−0.194	0.078	−0.126	0.014				
	1	YPI-S-II	−0.336	0.044	−0.341	<0.001	0.116		58.047**	
	2	YPI-S-II	−0.323	0.049	−0.327	<0.001	0.117	0.001	29.172**	0.379
		PSCD-SR DI	−0.046	0.075	−0.031	0.539				

Note. *PSCD-SR*=Proposed Specifiers for Conduct Disorder Self-Report; *GM*=Grandiose-Manipulative; *CU*=Callous-Unemotional; *DI*=Daring-Impulsive; *CD*=Conduct Disorder; *YPI-S*=Youth Psychopathic Traits Inventory-Short Version; *II*=Impulsive-Irresponsible; * $p<.05$; ** $p<.001$

The Incremental Contribution of the Three PSCD Psychopathic Personality Subscales over the PSCD CD

We included the PSCD CD subscale in the first block, followed by the PSCD GM, CU, and DI subscales in the second block. As shown in Table 6, the three components of the PSCD provided significant incremental contributions over the PSCD CD component in predicting CD problems ($\Delta R^2 = 0.030$, $p = < 0.001$), proactive aggression ($\Delta R^2 = 0.038$, $p = < 0.001$), delinquency ($\Delta R^2 = 0.017$, $p = < 0.05$), and relational aggression ($\Delta R^2 = 0.044$, $p = < 0.001$) (see Table 6).

Discussion

The current study was conducted with multiple aims. We first explored the associations between PSCD scores and their corresponding APSD and YPI-S scores. Secondly, we investigated the associations of these measures with external correlates of interest, followed by a comparative analysis of their correlation coefficients with external variables to assess whether they yield the theoretically expected relations. Next, the incremental contribution of the PSCD GM, CU, and DI subscales over their corresponding APSD and YPI-S scores were examined. Finally, we explored if adding the three psychopathic personality components of PSCD over the PSCD CD subscale provided significant incremental contributions. We discuss the findings in detail below.

Correlation Coefficients across Psychopathy Measures Scores

Given that the PSCD, APSD, and YPI-S measure the same psychopathy construct, it was hypothesized that each subscale yields moderate to strong associations with its corresponding subscale in alternate psychopathy measures. Such findings provide evidence supporting the convergent validity of their scores. In this vein, as expected based on theory and prior research (Salekin et al., 2023), the PSCD total and GM subscale yielded strong associations with their corresponding APSD and YPI-S scores. Likewise, the PSCD DI subscale was strongly related to APSD Impulsivity subscale and moderately with YPI-S II subscale. Additionally, the results showed that the APSD total and subscales of Narcissism and Impulsivity demonstrated significant strong associations with their corresponding YPI-S scores (e.g., Ebrahimi et al., 2021a, 2022; Colins et al., 2022; Elhami Athar et al., 2023, 2024). However, in terms of the CU subscale, the results showed several inconsistencies. The PSCD CU subscale was weakly associated with APSD CU subscale, while the YPI-S CU subscale did not demonstrate a significant association with APSD CU subscale. This may signify that the APSD CU subscale is measuring something different than the PSCD and YPI CU scales as has been noted in prior studies (e.g., Colins et al., 2014b; Pechorro et al., 2017; Wang et al., 2017; Luo et al., 2021). More specifically, the APSD CU items 3 (*"You care about how well you do at school or work"*), 7 (*"You are good at keeping promises"*), 19 (*"You hide your feelings or emotions from others"*), and 20 (*"You keep the same friends"*) are not tapped by the PSCD and YPI-S CU subscale. These items might explain the lower-than-expected associations of the APSD CU subscale with the PSCD and YPI-S CU subscale (Elhami Athar et al., 2023). Overall, while the original APSD was developed

as a downward adaptation of the PCL-R, this attempt was only partially achieved, given that some PCL-R items do not have clear counterparts in the APSD (Dillard et al., 2013; Salekin et al., 2018). For instance, the APSD item 3 (i.e., *concern about performance*) was reportedly intended to index selfish–egocentric tendencies, but the analyses of Dillard and colleagues (2013) indicated that this item may correspond more closely to the PCL-R item, "irresponsibility." Thus, these item differences may explain the comparison violation in the convergent and discriminant validity analysis at the psychopathy component level scales for the APSD CU trait scale. The APSD CU scale may reflect some of the item content which reflects hiding feelings, caring about school performance, and other items that differ from the PSCD and YPI that may be more closely tied to Cleckely (1941–1988).

Correlation Coefficients with External Correlates of Interest and Comparative Interpretation of Correlation Coefficients across Measures

Our results showed that the PSCD and YPI GM subscales demonstrated at best moderate associations with social problems scores, which is in line with prior research (e.g., Muratori et al., 2021; Elhami Athar et al., 2023) and theory (Cleckley., 1941–1988). Individuals with elevated GM levels could implement impression management strategies to impress others in social situations, which decreases the likelihood and/or the detection of social problems. Therefore, it is expected that the interpersonal domain of psychopathy measures yield, at most, a moderate relationship with social problems (Elhami Athar et al., 2023). Meanwhile, the magnitude of this correlation coefficient was stronger for the APSD Narcissism. Possibly, the APSD items 11 (*"You tease or make fun of other people."*) and 15 (*"You get angry when corrected or punished."*) could explain this finding. Teasing is an interpersonal behavior that most victims perceive as cruel and a means of hurting someone's feelings. Therefore, it is expected that those exhibiting teasing behaviors experience higher levels of interpersonal and social problems (e.g., Ebrahimi et al., 2021b). This pattern of interpersonal problems could be further exacerbated by one's *"bragging a lot about his/her abilities, accomplishments, or possession"* as tapped by APSD item 8. To talk with excessive pride about achievements or possessions is likely to encourage a sense of envy and competition. It is possible that those with elevated PSCD GM traits are more popular even though they are also exhibiting dominance and conduct problems (e.g., Muratori et al., 2021). Likewise, a consistent behavioral style of *"getting angry towards those who try to correct or punish someone"* (as assessed by APSD item 15) illustrates the lack of emotion regulation and a lack of flexibility in accepting others' ideas, which could result in interpersonal problems. In further support of these ideas, our findings showed that the PSCD and YPI-S GM subscale were moderately associated with relational aggression, while the association was in the strong range for the APSD Narcissism subscale. Likewise, when examining the associations between the interpersonal dimension of the three measures with ADHD, ODD, and CD problems and proactive aggression, APSD Narcissism yielded the strongest correlations with these variables, indicating that APSD Narcissism is highly associated with externalizing problems when compared to its corresponding PSCD and YPI-S scores, but is also more highly correlated with internalizing psychopathology (anxiety, depression). These findings highlight that correlations between the interpersonal component of the psychopathy construct and externalizing psychopathology differ depending on the measure used, underscoring the importance of considering measure-specific nuances in future research. One

Table 6 Hierarchical regression analyses to test the incremental validity of PSCD-SR GM, CU, and DI subscale score over the PSCD CD in predicting external correlates ($n = 444$)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	B	SE	β	*p*	R^2	ΔR^2	F	F-Change
Conduct Problems	1	PSCD-SR CD	0.746	0.059	0.516	<0.001	0.266		160.581**	
	2	PSCD-SR CD	0.596	0.068	0.413	<0.001	0.297	0.030	46.308**	6.294**
		PSCD-SR GM	0.146	0.088	0.078	0.096				
		PSCD-SR CU	0.192	0.062	0.144	0.002				
		PSCD-SR DI	0.041	0.059	0.031	0.491				
Proactive Aggression	1	PSCD-SR CD	0.675	0.055	0.506	<0.001	0.256		151.815**	
	2	PSCD-SR CD	0.524	0.063	0.392	<0.001	0.294	0.038	45.642**	7.886**
		PSCD-SR GM	0.308	0.081	0.177	<0.001				
		PSCD-SR CU	0.100	0.057	0.081	0.081				
		PSCD-SR DI	0.011	0.055	0.009	0.842				
Delinquency	1	PSCD-SR CD	1.277	0.153	0.368	<0.001	0.136		69.439**	
	2	PSCD-SR CD	1.045	0.180	0.302	<0.001	0.152	0.017	19.736**	2.874*
		PSCD-SR GM	0.437	0.230	0.097	0.058				
		PSCD-SR CU	0.284	0.163	0.089	0.081				
		PSCD-SR DI	−0.100	0.155	−0.032	0.520				
Relational Aggression	1	PSCD-SR CD	0.993	0.092	0.458	<0.001	0.210		117.343**	
	2	PSCD-SR CD	0.749	0.106	0.345	<0.001	0.254	0.044	37.315**	8.617**
		PSCD-SR GM	0.474	0.135	0.168	0.001				
		PSCD-SR CU	0.263	0.096	0.131	0.006				
		PSCD-SR DI	−0.075	0.091	−0.038	0.411				

Table 6 (continued)

Outcome Variable			Unstandardized Coefficients		Standardized Coefficients					
	Block	Variable	B	SE	β	*p*	R^2	ΔR^2	F	F-Change
School Performance	1	PSCD-SR CD	−0.579	0.074	−0.349	<0.001	0.122		61.166**	
	2	PSCD-SR CD	−0.590	0.087	−0.356	<0.001	0.131	0.009	16.512**	1.552
		PSCD-SR GM	0.206	0.112	0.095	0.066				
		PSCD-SR CU	−0.038	0.079	−0.025	0.630				
		PSCD-SR DI	−0.101	0.075	−0.067	0.179				

Note. *PSCD-SR*=Proposed Specifiers for Conduct Disorder Self-Report; *GM*=Grandiose-Manipulative; *CU*=Callous-Unemotional; *DI*=Daring-Impulsive; *CD*=Conduct Disorder; * $p<.05$; ** $p<.001$

potential factor contributing to these varying associations could be differences in the items of the measures' interpersonal component. For instance, the initial conceptualization of psychopathic personality by Cleckley (1941–1988), included criteria such as "untruthfulness" and "insincerity," which align with the interpersonal domain of various psychopathy measures such as the PCL-R (item 3: *"Pathological Lying"*), the YPI-S (item 5: *"I am good at getting people to believe in me when I make something up"*), and the PSCD (item 6: *"Lying is easy for me"*). However, it is interesting to observe that the corresponding item in the APSD (item 6: *"You lie easily and skillfully"*) did not load on any of the APSD subscales and is only considered in calculating the APSD total score. This discrepancy may further explain the different associations observed between APSD Narcissism and external correlates compared to PSCD and YPI-S GM subscales.

The results further demonstrated that in support of their discriminant validity, the PSCD and YPI-S GM subscales but not the APSD Narcissism yielded weak associations with indices of anxiety/depression and trait anxiety as noted above (e.g., Derefinko, 2015). In terms of the CU subscale, our results showed that it yielded the hypothesized weak correlations with anxiety and depression scores across the three measures, though only PSCD and YPI-S CU scores yielded weak associations with trait anxiety. Overall, studies suggested that the interpersonal and affective domains of psychopathy are expected to yield at most weak correlation coefficients with state/trait anxiety and depression scores (e.g., Cleckley., 1941–1988; Hare, 2003; Derefinko, 2015). As such, our findings suggest the PSCD and YPI-S GM and CU subscales demonstrated better discriminant validity from internalizing psychopathology than their corresponding APSD scores. Also, as expected, the affective dimension of the PSCD, APSD, and YPI-S was weak to moderately associated with indices of externalizing problems, e.g., ODD/CD problems, proactive aggression, and delinquency (e.g., Ebrahimi et al., 2021a, 2022; Colins et al., 2022; Elhami Athar et al., 2023, 2024). When examining the associations between the affective dimension of psychopathy measures with ADHD and relational aggression, the results showed that the magnitude of the correlation coefficients was in the moderate range for the PSCD, though in the weak range for the APSD and YPI-S. Future studies are needed to further examine these findings. This is important as Cronbach and Meehl (1955) noted that construct validity should be an ongoing process.

Based on theory and prior studies, it is expected that the interpersonal domain of psychopathy demonstrates non-significant to weak negative associations with poor school performance, while this relationship is expected to be at least in the weak range for the affective domain and in the moderate range for the behavioral domain of psychopathy (e.g., Vaughn et al., 2011; Bird et al., 2019). The interpersonal dimension of all three measures demonstrated the hypothesized associations with poor school performance, though only the affective dimension of PSCD and YPI-S yielded the expected weak association with school performance, while the association was in the moderate range for the APSD CU. The overlap of the APSD item 3, *"You care about how well you do at school or work,"* with school performance might explain this higher-than-expected correlation. Further, our results showed that the affective dimension of the three psychopathy measures demonstrated the expected negative associations with affective empathy, supporting the discriminant validity of their scores. However, our findings showed that the APSD CU had a *higher* association with cognitive empathy than affective empathy. This finding is inconsistent with existing research and theoretical frameworks suggesting that children exhibiting psychopathy and

perhaps CU traits tend to display more pronounced deficiencies in affective than cognitive empathy (Jones et al., 2010; Waller et al., 2015). Here, however, with respect to the APSD CU scale, youth with elevated traits do not show the same level of mentalizing and perspective-taking at a cognitive level as would be expected for the construct of psychopathy (e.g., Cleckley., 1941–1988; Hare, 2003).

In terms of the behavioral dimension of psychopathy, the PSCD moved away from assessing only impulsivity but rather focuses more on daring-impulsive behavior. Therefore, we expected the PSCD DI to yield some lower associations with theoretically related correlates of impulsivity compared to its counterpart APSD and YPI-S scores. In line with our hypothesis, the behavioral dimensions of APSD and YPI-S yielded stronger associations with indices of internalizing (anxiety and depression) and externalizing problems (ADHD/ODD/CD problems, delinquency, proactive aggression, relational aggression), social problems, school performance, and cognitive empathy when compared to PSCD DI. Finally, the PSCD CD demonstrated the anticipated associations with convergent variables of externalizing problems (ADHD/ODD/CD problems, delinquency, proactive aggression, relational aggression), social problems, school functioning, and affective/cognitive empathy. Also, consistent with the idea that people with higher CD levels are anticipated to show at least small associations with anxiety and depression, the PSCD CD yielded moderate association with indices of anxiety and depression (for a review, see Derefinko, 2015). Overall, the PSCD and YPI demonstrated better convergent/discriminant validity than the APSD, showing convergent validity with externalizing psychopathology (CD, ODD) and discriminant validity with internalizing psychopathology (anxiety and depression), whereas the APSD appeared to be more strongly correlated with both forms of pathology raising questions about whether it indexes more general psychopathology and psychosocial problems than the psychopathy construct alone, where it is believed to be associated with CD and ODD, but to be essentially unassociated with anxiety and depression (e.g., Cleckley., 1941–1988; Hare, 2003).

Incremental Validity Analyses

Overall, the PSCD GM and CU scores provided significant incremental contribution over their corresponding APSD scores in predicting outcome variables of CD problems, delinquency, proactive aggression, relational aggression, and school performance, though with a few exceptions: the PSCD GM did not provide significant incremental addition over the APSD Narcissism in predicting CD problems and school performance. Likewise, the PSCD CU failed to yield significant incremental contributions over the APSD CU in explaining school performance. In addition, the PSCD GM and CU scores provided significant added value over their corresponding YPI-S scores in predicting outcome variables. As expected, the PSCD-DI did not demonstrate significant incremental addition over its corresponding APSD and YPI-S score in explaining external correlates. Psychopathy is a complex condition and having elevated psychopathy traits does not signify that such individuals will exhibit problems in all domains. For instance, it has been shown that the PSCD GM scale is not typically highly associated with school difficulties. Rather, research has shown that youth with elevated GM traits tend not to exhibit difficulties in school or that these deficits are much more limited than those exhibited by youth with high levels of CU traits for example (e.g., Bellamy et al., 2024). Also, youth with elevated PSCD GM traits tend to

be perceived as more likable and having fewer problems with peers (e.g., Muratori et al., 2021). Likewise, youth with elevated scores on the PSCD DI show less difficulty with peers even though they exhibit conduct problems (e.g., Muratori et al., 2021).

We investigated whether the interpersonal (GM), affective (CU), and behavioral (DI) components of the PSCD could provide significant added value over the PSCD CD component. Our findings revealed that when incorporating the three PSCD components in the regression analyses, there were significant additional contributions in explaining external correlates such as CD problems, delinquency, proactive aggression, and relational aggression. These results highlight the importance of psychopathy components as significant predictors of important outcome variables even after controlling for CD. These findings encourage future studies to examine the utility of multiple psychopathy components as specifiers for CD. Integrating psychopathic personality components alongside CD may facilitate the exploration of how personality precursors can contribute to the CD diagnosis (e.g., Salekin, 2016b, 2017; Salekin et al., 2018). Recent studies provide initial support for the utility of multiple psychopathy specifiers for CD (e.g., Colins et al., 2023; Bellamy et al., 2024) and ODP (Elhami Athar, 2024). However, drawing definitive conclusions at this stage would be premature. Instead, it would be beneficial to continue conducting thorough evaluations to assess the practicality of psychopathy components as specifiers. Such research should be encouraged and would contribute to the ongoing discourse on the subject.

Implications for Practice and Future Studies

In spite of significant advances in the assessment and conceptualization of psychopathy, there continue to be needed refinements in the conceptualization and operationalization of the psychopathy construct. In this vein, because the PSCD is offered as a novel way of assessing psychopathic traits in relation to CD, it requires some testing in relation to other conceptualizations of psychopathy to determine if this approach warrants further investigation. The results from this study suggest that the PSCD may have research and eventually clinical value although more research is needed on the subject. Our findings showed that the PSCD offered some advantages with respect to predicting negative outcomes. Furthermore, the pattern of results suggested that the PSCD-SR and YPI-S scores were more consistently and more strongly related to their corresponding measures and external correlates compared to the APSD scores at least in this study sample. Therefore, clinicians and researchers should carefully consider which youth psychopathy measures to use in their assessments, and they should be aware that findings from youth psychopathy measures may vary as a function of measures. They should also be careful in drawing general conclusions about the construct of youth psychopathic features based on the findings that are a function of measures. We suggest that future research should aim to test which measures work best in which settings.

In addition, our findings demonstrate that the three psychopathy components of the PSCD provided significant added value over the CD component in predicting important external variables. These findings encourage future studies to examine psychopathy components as specifiers for CD. We believe that studying the antisocial component along with psychopathic personality traits can make significant contributions to the literature on youth psychopathy and CD. Specifically, this approach facilitates longitudinal studies to investigate how psychopathic traits predispose individuals to antisocial behavior, thereby enhanc-

ing our understanding of the etiology, classification, and treatment of various subtypes of youths with CD. However, few studies have been conducted on the connection between the psychopathy components and CD which necessitates future studies to examine psychopathic personality components along with CD symptoms in order to advance our knowledge in this subject. Finally, this approach has the potential to help clinicians tailor their interventions to the specific personality styles that accompany CD (Salekin et al., 2018), which is supported by findings that each of the psychopathy dimensions exhibit diverse relationships with variables which may inform the psychotherapy process and outcome (Elhami Athar, 2023). Nevertheless, these relations and potential mechanisms will not be fully understood until research systematically examines the wider concept of psychopathy with CD.

Limitations

Our findings should be interpreted in the context of some limitations. First, the use of self-report measures to gather the data, and the resulting shared method variance could partly explain the associations between variables, however, as our aim was to compare the three self-report measures of youth psychopathy, this issue was unavoidable. Nonetheless, future studies could replicate our results using data from multiple informants. Second, this study included only school-attending youth as the study sample, so future research must ascertain if findings can be generalized to samples of criminal justice-involved or conduct-disordered youth. Third, given that our data collection coincided with the COVID-19 pandemic, it would be beneficial to re-examine the results when youths in school samples now that school has resumed. Fourth, we did not apply strict correction techniques for multiple comparisons in our analyses given that this was a first attempt at exploring these important relations and this may increase the likelihood of false positives in our study. As research moves forward in this area, future research studies should aim to replicate our results while employing even stricter correction corrections for multiple comparisons to be sure that the results here are replicated. Fourth, our study focused on assessing the incremental value of the PSCD-SR over the APSD and YPI-S to contribute to the literature on this novel measure. While this approach addressed one aspect of incremental validity, we acknowledge that future studies are needed to examine if the APSD and YPI-S demonstrate evidence of incremental validity over the PSCD-SR. In the case of this study, the APSD was shown to correlate with a variety of problems (externalizing and internalizing), which may indicate that it is better at the prediction of a wide variety of problems including internalizing symptoms. Additionally, further investigation into the practical implications of using multiple measures for assessing the same construct is warranted in subsequent studies. Finally, the study was based on concurrent data and therefore limits our ability to infer causation. This also underlines the need for future longitudinal studies on this topic. Despite these limitations, this study provides some of the first data to examine how various psychopathy measures may enhance our understanding of major classes of mental illness, including externalizing and internalizing psychopathology. It also explores their relationships to important external correlates, which are crucial for evaluating construct validity, a process that should be ongoing (Cronbach & Meehl, 1955).

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Author contributions MEA: gathered data, performed the data analysis, and drafted the manuscript. RTS: drafted, reviewed/revised the manuscript. MH, PR, GF, and EZ: gathered data. All authors contributed to the article and approved the submitted version.

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Data Availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics Approval and Consent to Participate All the study procedures were conducted according to ethical standards outlined by the World Medical Association's Declaration of Helsinki and were approved by the Institutional Review Board.

Consent to Participate Informed consent was obtained from all individual participants/and their guardians included in the study.

Competing interests There was no conflict of interest in this study.

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