



## Factor structure and clinical utility of the Youth Psychopathic Traits Inventory in an inpatient sample



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### ABSTRACT

Previous research on the Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002) has identified a three-factor structure: Interpersonal, Affective, and Behavioral. The present study sought to test this three-factor structure and broader psychometric properties of the YPI in a sample of 328 adolescents undergoing inpatient psychiatric care. Confirmatory factor analyses were used to test the hypothesized three-factor structure of the YPI previously documented in community samples. Exploratory analyses reported on modification indices, gender invariance, and fit of a bifactor model. Additionally, the clinical utility of the YPI was examined by examining the relation between the YPI and the antisocial personality scale of the Personality Assessment Inventory (PAI-A-ANT; Morey, 2007). Confirmatory Factor Analysis results did not replicate the previously documented three-factor structure in the inpatient sample; a bifactor model continued to display poor (albeit improved) fit. Still, there was a strong association between the YPI (total and factor scores) and PAI-A-ANT, as such the YPI accurately identified adolescents with clinically significant antisocial traits. A cut-off score is presented for the YPI total score.

### 1. Introduction

Psychopathy is commonly diagnosed in early adulthood, yet there is evidence that psychopathic traits can first manifest during adolescence and are conceptualized as continuous across development (Forth and Mailloux, 2000) and relatively static (Harris et al., 2015). Some have argued that core psychopathic traits such as egocentrism, irresponsibility and impulsivity are normative in youth (Pettila and Skeem, 2003; Seagrave and Grisso, 2002), while others have provided support for the presence of non-normative psychopathic traits among adolescents (Farrington, 2005; Frick and Marsee, 2006; Neumann et al., 2006). This debate points to the need for additional research on psychopathy in young samples. Further, the early identification of psychopathic traits in adolescence has been of growing interest, primarily due to the notion that early detection provides an opportunity to preempt further impairment through early intervention (Forth and Mailloux, 2000), preventive programs, prediction of violent behavior (Seagrave and Grisso, 2002), and insight on different pathways towards severe antisocial behaviors (Salekin and Lynam, 2011). Given that there is significant lack of treatment and intervention for psychopathy in both adults and adolescents, research in youth can not only add important clinical information but also potentially enhance the early

identification of psychopathic traits and the development of early treatment approaches.

While psychopathy is widely assessed in offender populations to inform decisions about adolescents in the justice system (Caffman et al., 2009, 2016; Viljoen et al., 2010), it is assessed much less frequently in clinical settings. However, psychopathy assessments also carry clinical import; in adolescents, psychopathic traits relate to problems with peers (Munoz et al., 2008), criminal behavior (e.g. Poythress et al., 2006), antisocial behavior (Declercq et al., 2009), and impulsivity, anger, and violent behaviors and substance use (e.g., Colins et al., 2015); all problematic situations likely to be relevant in clinical settings. Thus, several measures have been developed to assess psychopathy in adolescents, such as the Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002), which is the focus of the current study. The YPI focuses on core interpersonal, behavioral, and affective features of psychopathic personality (Skeem and Caffman, 2003) and has demonstrated that it can identify severely aggressive, antisocial adolescents (e.g., Andershed et al., 2002), and is associated with criminal behavior (Dolan and Rennie, 2006), delinquency, gang involvement (Poythress et al., 2006), and destruction of property (Skeem and Caffman, 2003).

The factor structure of the YPI has been a topic of some uncertainty.

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Most available research in community-based (Colins and Andershed, 2016; Declercq et al., 2009; Simoes et al., 2016; Skeem and Cauffman, 2003; Pechorro et al., 2016; Pihet et al., 2014) and offender populations (Andershed et al., 2015; Dolan and Rennie, 2006; Pechorro et al., 2006; Pihet et al., 2014; Veen et al., 2011) supports a the three-factor structure (i.e., interpersonal, affective, and behavioral factors) based on the Cooke and Michie's model of psychopathy (2001). However, support has also been found for bifactor models in which a general factor representing shared variance among all the indicators and a set of group factors where variance over and above the general factor is shared among subsets of indicators presumed to be highly similar in content (Rodríguez et al., 2016). Indeed, a bifactor model for the YPI has been supported in several previous studies conducted by Zwaanswijk et al. (2016, 2017) and others (Oshukova et al., 2015; Pihet et al., 2014).

Thus, the vast majority of previous research supports a three-factor structure of the YPI (in some cases with an additional general factor), suggesting that the underlying manifestation of psychopathy can be clearly differentiated in three groups of symptoms (behavioral, affective, and interpersonal). This three-factor structure is also echoed in research with adults, which has generally moved from conceptualizing psychopathy as two-factors (affective/interpersonal and behavioral dimensions; Harpur et al., 1989) to Cooke and Michie's (2001) three-factor model consisting of affective, interpersonal, and behavioral dimension. Some additional research has also supported a four-factor model in adults (Neumann and Hare, 2008), in which the behavioral dimension is divided in lifestyle and antisocial factors. Still, more research is needed to elucidate these mixed results in adolescent samples. Additionally, studies with clinical samples are limited, and inpatient psychiatric samples are particularly lacking, therefore vastly limiting the YPI's clinical utility. Clinical samples inherently include a variety of co-morbid psychopathology, making the clinical presentation of psychopathy more complex and harder to study than community samples. The current study aims to explore if the dominant, three-factor structure of the YPI that has been replicated in prior research can be extended to an inpatient psychiatric adolescent sample. Studying the psychometric properties of measures that assess psychopathic traits (such as the YPI) in adolescents is important for the accurate identification of these traits in clinical settings, as psychopathic traits may govern treatment style or therapeutic goal setting to some extent. Further, factor analytic research with adolescent samples may help to elucidate how psychopathy manifests in young people.

The current study had two overarching goals: (1) replicate the aforementioned three-factor structure for the first time in an inpatient adolescent sample. To do so, the current study tests the presence of three expected underlying constructs through Confirmatory Factor Analyses. Given the absence of data from inpatient groups, hypotheses were based on prior research in forensic and community samples. That is, given that the majority of previous findings have validated the three-factor structure of the YPI, we hypothesized a three-factor structure would also be replicated in the current sample. (2) The current study inspects the relation of the YPI and the Personality Assessment Inventory, antisocial scale (PAI-A-ANT; Morey, 2007). The Personality Assessment Inventory for adolescents (PAI-A; Morey, 2007) was selected as a comparison measure in the current study given its well-studied utility in clinical samples (Archer, 2006). To do so, the current study uses Pearson correlations. Based on previous studies in which the YPI has identified adolescents with antisocial traits (Andershed et al., 2002) and demonstrated positive associations with antisocial and related behaviors (Dolan and Rennie, 2006; Poytheress et al., 2006; Skeem and Cauffman, 2003), we expected the PAI-A-ANT to be strongly and positively correlated with the YPI (total score and all three hypothesized factors). Further, we hypothesized that the YPI would successfully identify participants with clinically significant levels of antisocial personality. While using ROC analyses, we proposed to examine the cut-off score of the YPI total and test its sensitivity and specificity in identifying participants who have clinically significant antisocial

personality traits (based on the PAI manual).

## 2. Methods

### 2.1. Participants

This sample included 328 adolescents with ages ranging from 12 to 17 ( $M = 15.42$ ,  $SD = 1.41$ ), admitted to a private psychiatric hospital. Of these, 206 (62.8%) were female and 122 (37.2%) were males. The sample was largely high income with nearly 50% reporting an annual household income of \$125,000 or more. Of these youth, 78.4% were White, 11% did not report their race, 5.2% were multiracial or identified as another race, 3.4% were Asian American, and 2.1% were Black. These adolescents typically had a history of treatment refractory emotional and behavioral symptoms, with many meeting criteria for more than one psychiatric disorder. In terms of primary diagnoses, 69.8% of youth met diagnostic criteria for a mood disorder (e.g., bipolar disorder, depression, dysthymic disorder), 22.3% of youth met diagnostic criteria for an anxiety disorder (e.g., social anxiety, phobias, obsessive-compulsive disorder), 3.7% met criteria for a substance abuse or dependence disorder, 1.5% met criteria for behavioral related disorders (e.g., oppositional defiant disorder, conduct disorder), and 1.2% met criteria for active psychotic disorder (e.g., schizoaffective, schizophrenia).

### 2.2. Measures

#### 2.2.1. Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002)

The YPI is a 50-item, self-report measure that assesses psychopathy among youth. Items from the measure make up three factors and ten subscales of five items each: The Interpersonal factor (YPI-Int) comprises the Dishonest Charm (YPI-DC; e.g., "I have the ability to con people by using my charm and smile"), Grandiosity (YPI-G; e.g., "I'm better than everyone on almost everything"), Lying (YPI-L; e.g., "Sometimes I lie for no reason, other than because it's fun"), and Manipulation scales (YPI-M; e.g., "I can make people believe almost anything"); the Affective factor (YPI-Aff) comprises the Remorselessness (YPI-R; e.g., "To feel guilt and regret when you have done something wrong is a waste of time"), Unemotionality (YPI-U; e.g., "I usually feel calm when other people are scared"), and Callousness scales (YPI-C; e.g., "I think that crying is a sign of weakness, even if no one sees you"); and the Behavioral factor (YPI-Beh) comprises the Thrill Seeking (YPI-TS; e.g., "I like to be where exciting things happen"), Impulsiveness (YPI-IM; e.g., "I consider myself as a pretty impulsive person"), and Irresponsibility (YPI-IR; e.g., "I have often been late to work or classes in school") scales. In the current sample, the total internal consistency was acceptable ( $\alpha = 0.92$ ). The YPI is available, free of charge, in multiple language at <https://www.oru.se/english/research/research-environments/hs/caps/ypi/>.

#### 2.2.2. Personality Assessment Inventory-Adolescent; antisocial scale (PAI-A-ANT; Morey, 2007)

The PAI-A is a 264-item, self-report inventory of adolescent personality and psychopathology adapted from the Personality Assessment Inventory (PAI; Morey, 1991, 2007). It includes four validity scales, 11 clinical scales, five treatment scales, and two scales that assess interpersonal style. The PAI-A have demonstrated acceptable psychometric properties across large standardization samples of community and clinical samples (Morey, 2007).

The current study focuses specifically on the Antisocial scale of the PAI-A (PAI-A-ANT), a 20-item scale intended to measure a history of illegal acts and authority problems, egocentrism, lack of empathy and loyalty, instability, and excitement-seeking in youth. While the PAI-A-ANT scale contains three subscales—Antisocial Behaviors, Egocentricity, and Stimulus-Seeking—to assess the major components of the antisocial construct (Morey, 2007), the statistical analyses of the

current study uses the PAI-A-ANT overall scores, as the current study aims to capture antisociality as a whole construct, with all its domains. The dataset used in the current study did not contain item-level data; therefore, internal consistency estimates could not be calculated.

### 2.3. Procedures

The study was approved by the appropriate institutional review boards (IRB) and was therefore performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. On the day of admission to an adolescent inpatient unit at a private-pay psychiatric hospital, parental informed consent was obtained, followed by adolescent informed assent. Adolescents met the inclusion criteria if they were between the ages of 12 and 17, were fluent in English, and intellectual disability or psychosis was not suspected. Data was collected within the first week of admission.

### 2.4. Statistical analysis plan

SPSS software was used to conduct all statistical analyses, including distribution characteristics, internal consistency reliability (alpha coefficient), gender differences (*t*-tests), and correlations among variables (Pearson correlations). Confirmatory factor analysis (CFA) with maximum likelihood estimation was performed with AMOS 16.0 (Arbuckle, 1995–2007) to test if the YPI three-factor structure, proposed by Andershed et al. (2002), could be replicated and test model fit in the sample. The tested model contained three factors (Interpersonal, Affective, and Behavioral), hypothesized to underlie the 10 subscales or observed variables. CFA and post-hoc exploratory analyses were performed on subscale rather than on item level data, using the same methodology as previous studies (Andershed et al., 2002; Pechorro et al., 2016; Pihet et al., 2014). All factors were allowed to correlate freely and no item-residuals were permitted to correlate. To examine the degree to which psychopathy converged with antisocial personality traits, correlations were calculated between the total and factor scores of the YPI and PAI-A-ANT in the sample. Receiver Operating Characteristics (ROC) analysis was used to assess the performance of the YPI total in predicting the concurrent presence of a clinically significant score on the PAI-A-ANT and to establish an YPI cut-off score of clinical relevance. All analyses were completed using SPSS, Release 22.0.

## 3. Results

Results indicated that data did not significantly deviate from the normal curve distribution. Descriptive data (i.e., mean, standard deviation, range, and Cronbach's alpha values) and gender differences on the YPI total and subscale scores are depicted in Table 1. With respect

**Table 1**  
Descriptive data and gender differences on the YPI factors and subscales.

YPI factor/subscale	Range	Mean (SD) males/females	<i>t</i>	<i>p</i>	$\alpha$
Interpersonal factor	6–17	11.20 (2.39) / 10.59 (2.06)	2.47	<b>0.015</b>	0.81
Dishonest Charm	5–17	10.74 (2.90) / 10.89 (2.54)	−0.46	0.642	0.50
Grandiosity	5–20	13.00 (3.29) / 12.79 (2.88)	0.60	0.548	0.55
Lying	5–20	11.07 (3.12) / 10.03 (2.87)	3.08	<b>0.002</b>	0.58
Manipulativeness	5–19	9.97 (3.02) / 8.63 (2.55)	4.28	<b>0.000</b>	0.64
Affective factor	5–19	10.71 (2.54) / 10.41 (2.61)	1.00	0.316	0.83
Remorselessness	5–20	10.26 (3.37) / 10.30 (3.76)	−0.09	0.926	0.79
Unemotionality	5–19	11.01 (2.57) / 10.68 (2.43)	1.14	0.255	0.40
Callousness	5–20	10.85 (2.91) / 10.25 (2.99)	1.78	0.075	0.59
Behavioral factor	5–18	10.59 (2.34) / 10.06 (2.32)	2.01	<b>0.045</b>	0.79
Thrill Seeking	5–18	10.99 (2.51) / 10.85 (2.62)	0.48	0.631	0.47
Impulsivity	5–19	9.70 (2.80) / 8.65 (2.67)	3.37	<b>0.001</b>	0.59
Irresponsibility	5–20	11.09 (2.94) / 10.67 (2.95)	0.42	0.218	0.55
Total score	59–177	108.77 (22.66) / 103.41 (21.55)	2.14	<b>0.033</b>	0.92

Note: Bold font indicates clinically significant gender group difference.

to gender differences, males endorsed significantly higher scores than females on the Interpersonal [ $t(326) = 2.47, p = .015$ ] and Behavioral factors [ $t(326) = 2.01, p = .045$ ], specifically on the Lying and Manipulativeness and Impulsiveness subscales. On the Affective Factor, there were no significant gender differences. Additionally, there were no significant correlations between YPI scores and age. Internal consistency of the YPI was acceptable ( $\alpha = 0.92$ ), using 0.65 as the benchmark for acceptability (DeVellis, 2012). All factors had adequate values, ranging from 0.70 to 0.83. However, subscale alphas (based on five items for each scale) were lower with internal consistency values ranging from 0.40 to 0.64, except for the YPI Remorselessness scale ( $\alpha = 0.79$ ).

In terms of intercorrelation among all YPI scales, all subscales were significantly and positively correlated with one another (see Table 2), except for Callousness with Irresponsibility, and Thrill Seeking with three other subscales (Dishonest Charm, Impulsiveness, and Irresponsibility). At a factor level, all factors were significantly correlated ( $r = 0.78–0.93$ ).

### 3.1. Confirmatory factor analyses

We sought to examine a three-factor model hypothesized to underlie the 10 YPI subscales (model depicted in Fig. 1). Fit indices [ $\chi^2(32) = 472.07, p < .01; RMSEA = 0.20; CFI = 0.73; TLI = 0.67$ ] showed poor fit with the hypothesized model (see Table 3). For all factors, all indicators loaded significantly and in expected directions, except for the Thrill Seeking subscale on the Behavioral factor.

In light of poor model fit, three additional sets of analyses were undertaken. First, regression weight modification indices (MI exceeding 3.84; Whittaker, 2012) were examined (see Electronic Supplementary Material). MI greater than 3.84 was noted in 36 instances. Five of these instances suggested that scales be modified to load onto a non-hypothesized factor. Specifically, the Thrill-Seeking subscale was suggested for loading on both the Affective and Interpersonal factors. The Dishonest Charm scale was suggested for loading on both the Behavioral and Affective factors, despite its intended loading on the Interpersonal factor. The Lying scale was suggested for loading on the Behavioral factor, despite being intended to load on the Interpersonal factor. The remaining 31 instances with MI greater than four recommended correlating error terms, most often between subscales across factors. Because such a large number of modifications were suggested, and many of these are irreconcilable with the theory underlying the YPI (e.g., Dishonest Charm → Affective), MI are reported here to unpack the poor fit of the CFA model only. Indeed, MI risks over-fitting measurement models to sample idiosyncrasies, particularly when modifications are not theoretically justifiable (e.g., Kline, 2005).

Second, invariance testing was conducted in light of significant

**Table 2**  
Correlations among YPI scales.

	1	2	3	4	5	6	7	8	9	10	11
1. Dishonest Charm	–										
2. Grandiosity	0.34**	–									
3. Lying	0.23**	0.37**	–								
4. Manipulativeness	0.47**	0.83**	0.37**	–							
5. Remorselessness	0.73**	0.53**	0.26**	0.69**	–						
6. Unemotionality	0.35**	0.47**	0.33**	0.47**	0.48**	–					
7. Callousness	0.21**	0.36**	0.37**	0.36**	0.26**	0.56**	–				
8. Thrill Seeking	0.10	0.18**	0.19**	0.16**	0.12*	0.47**	0.58**	–			
9. Impulsivity	0.45**	0.48**	0.29**	0.44**	0.48**	0.34**	0.27**	0.07	–		
10. Irresponsibility	0.48**	0.43**	0.17**	0.43**	0.53**	0.30**	0.10	–0.02	0.63**	–	
11. Total Score	0.53**	0.52**	0.25**	0.52**	0.56**	0.35**	0.21**	0.03	0.84**	0.84**	–

\*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).

gender differences on the YPI subscales. Specifically, the hypothesized three factor model was compared to a model in which the factor loadings had been constrained to be equal across gender groups. Model comparison ( $\Delta\chi^2 = 9.82, \Delta df = 7, p = .199$ ) indicated that imposing these constraints did not significantly alter overall model fit, suggesting a group-invariant factor pattern.

Finally, a bifactor model was tested in which YPI scales loaded onto two factors at the same time: one of the three aforementioned factors as well as a general factor. More specifically, all ten subscales were assigned to a general psychopathy factor as well as being assigned to one of the three aforementioned factors (as in Fig. 1). Omega-hierarchical and omega-specific coefficients were computed using Dueber's (2017) method and are reported in Table 4. Omega-hierarchical values below 0.80 indicate that the YPI total score is inconsistent with a unidimensional model (Reise et al., 2013a,b). Fit indices [ $\chi^2(25) = 211.80, p < .01; RMSEA = 0.15; CFI = 0.88; TLI = 0.79$ ] showed poor fit. Still, the bifactor model represented a significant improvement upon the hypothesized three factor model ( $\Delta\chi^2 = 260.27, \Delta df = 7, p < .001$ ).

3.2. Convergent validity

Convergent validity of the YPI total and factors was examined using the PAI-A-ANT. In the sample, 70 cases were excluded due to having

**Table 3**  
CFA Standardized and unstandardized regression weights for YPI three-factor model.

Factor	Standardized loadings	Unstandardized coefficients (SE)
<i>Interpersonal factor</i>		
Lying	0.94	1
Grandiosity	0.87	0.88 (0.04)
Dishonest Charm	0.52	0.70 (0.07)
Manipulation	0.41	0.34 (0.04)
<i>Affective factor</i>		
Remorselessness	0.78	1
Unemotionality	0.64	0.71 (0.06)
Callousness	0.47	0.48 (0.06)
<i>Behavioral factor</i>		
Irresponsibility	0.78	1
Thrill-Seeking	0.11	0.11 (0.06)
Impulsivity	0.81	0.94 (0.08)

Note: Factor loading less than 0.4 is in bold, indicating weak factor loading.

invalid PAI protocols (i.e., Inconsistency scale was greater than 65 and Infrequency scale was greater than 75). Considering that youth with psychopathic traits might have engaged in impression management, as deception and lying are core traits of psychopathy, it was decided to

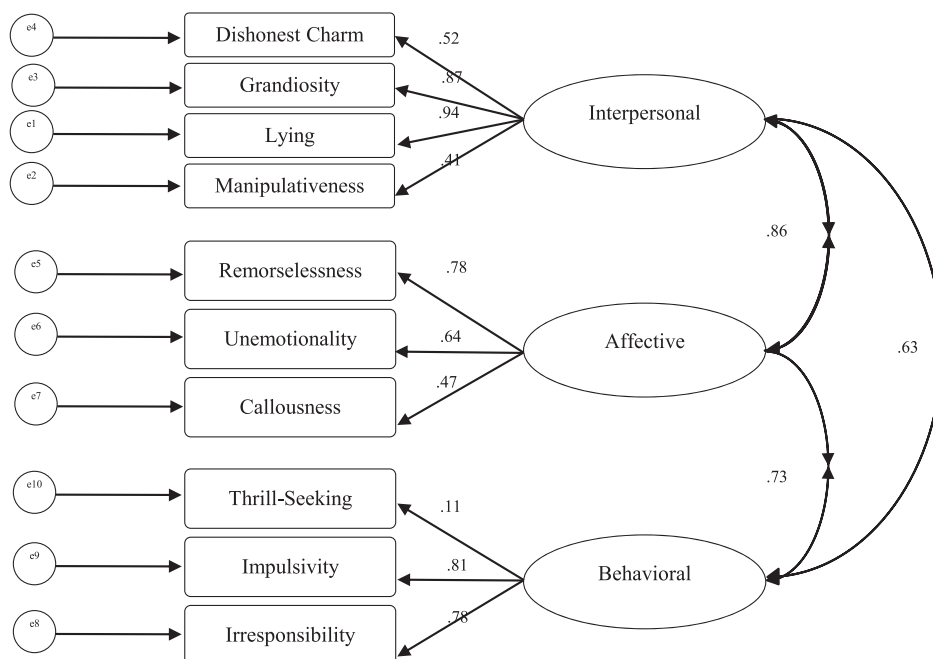


Fig. 1. Confirmatory factor analysis standardized loadings.

**Table 4**  
Bifactor indices.

Factor	Omega*	Omega hierarchical
General factor	0.705	0.023
Specific factor: Interpersonal	0.462	0.231
Specific factor: Affective	1.383	0.691
Specific factor: Behavioral	0.643	0.322

Note: Regarding the omega estimate, for the general factor all items are considered whereas for the specific factors, only items loaded onto that factor are considered.

**Table 5**  
Correlations between PAI Antisocial scale and YPI factors.

	1	2	3	4
1. YPI-Interpersonal factor	–			
2. YPI-Affective factor	0.78**	–		
3. YPI-Behavioral factor	0.78**	0.83**	–	
4. YPI-Total score	0.93**	0.93**	0.93**	–
5. PAI-A-ANT	0.71**	0.68**	0.59**	0.71**

PAI-A-ANT: Personality Assessment Inventory, Adolescent Version, Antisocial scale.

\*\* Correlation is significant at the 0.01 level (2-tailed).

keep the cases with significant elevations in the Negative Impression Management and Positive Impression Management scales in the dataset. The final dataset for convergent validity analyses therefore contained 258 valid cases (99 males and 159 females). The PAI-A-ANT average score was 52.69 ( $SD = 10.82$ ).

To test convergent validity examining the degree to which psychopathy converges with antisocial personality disorder, correlations were calculated between the YPI total and factor scores and PAI-A-ANT. Correlations were significant, large, and positive (range from  $r = 0.059$  to 0.71) in all cases (see Table 5).

Receiver Operating Characteristics (ROC) analyses were used to assess the performance of the YPI total in predicting the presence of a clinically significant score on the PAI-A-ANT and to establish a YPI cut-off score of clinical relevance. In the sample, a subset of 26% ( $n = 67$ ) met criteria for clinically significant antisocial features (using the traditional PAI-A threshold of 60 or above), and 74% ( $n = 191$ ) did not. Results indicated high diagnostic accuracy of the YPI total score in the sample ( $AUC = 0.85$ ;  $SE = 0.03$ ), indicating that a randomly selected youth in the sample with a score about 60 on the PAI-A-ANT would be highly likely to have a higher score on the YPI than a randomly selected youth with a score below 60. Plotting sensitivity and specificity at different cut-off scores on the YPI total score indicated that the optimal cut-point for the YPI, the intersection of sensitivity and specificity, is 112.25 ( $Se = 0.82$ ,  $Sp = 0.81$ ) for predicting clinically significant PAI-A-ANT scores.

#### 4. Discussion

The broad aim of this study was to add to the existing literature base regarding the Youth Psychopathic Traits Inventory's psychometric performance in adolescents with psychiatric illness. Specific analyses were conducted to (1) replicate the three-factor structure proposed by Andershed et al. (2002) in inpatient adolescents, and (2) explore the convergent validity of the YPI relative to the PAI Antisocial scale. Descriptive analyses demonstrated that the YPI total and scale scores were normally distributed. Consistent with previous research (e.g., Andershed et al., 2002; Colins et al., 2013; Poythress et al., 2006; Veen et al., 2011), the internal reliability of the YPI total score was adequate. However, lower internal consistency estimates were found among scales, echoing previous studies in non-forensic samples that have found poor internal consistency estimates, particularly for scales that

assess the Affective and Behavioral factors of psychopathy (Andershed et al., 2007), such as the Callousness (Pechorro et al., 2016), Unemotionality (Oshukova et al., 2015), Remorselessness, Thrill Seeking, Impulsiveness, and Irresponsibility scales (Declercq et al., 2009). As prior research has noted (Pihet et al., 2014), internal consistency results raise concerns about the YPI's ability to capture aspects certain of psychopathy, particularly unemotionality and thrill seeking traits, suggesting that these subscales require further study. Still, YPI scales have few items and, thus, internal consistency estimates—which are heavily influenced by the number of items—should not necessarily be interpreted as indicating poor reliability, especially in light of adequate overall internal consistency.

Consistent with previous studies, no relation between YPI scores and age was noted (Pihet et al., 2014). With respect to gender differences, males endorsed significantly higher YPI total scores than females and a group-invariant factor pattern was noted, providing evidence of validity in echoing prior theoretical work and empirical research (Declercq et al., 2009; Pihet et al., 2014; Wennberg, 2012). These findings broadly echo the original YPI study on a large non-forensic sample, in which males scored significantly higher than females on all three factors (Andershed et al., 2002). These results also add to a variety of results from prior studies in which males scored significantly higher than females on the Interpersonal and Affective but not on the Behavioral factor (Larson et al., 2006; Oshukova et al., 2015).

Regarding intercorrelations among the scales of the YPI, three non-significant correlations among scales warrant discussion. The Thrill-Seeking scale was not significantly correlated with the other two scales from its corresponding Behavioral factor (i.e., Impulsiveness, and Irresponsible) or with the Dishonest Charm scale from the Interpersonal factor. A possible contributing factor for these results could be that the Thrill-Seeking scale, from all 10 scales, obtained the weakest internal consistency value, suggesting that the items of the scale may not be tapping the same construct (i.e., Behavioral factor). In addition, the Callousness scale from the Interpersonal factor did not significantly correlate with the Irresponsibility scale from the Behavioral factor. Poorer psychometric performance of the Affective factor, broadly, and the Callousness scale, specifically, have been noted in previous studies with adolescent forensic samples (Poythress et al., 2006; Dolan and Rennie, 2006) and in an adolescent outpatient clinical sample (Andershed et al., 2007), echoing the findings of this study. It should be noted that the Callousness scale contains three reverse coded items—the only reverse coded items on the scale—which have previously been found to decrease internal consistency values (Neumann and Pardini, 2014) and might have weakened the inter-scale correlations. Another plausible explanation could be that identifying and endorsing interpersonal psychopathic traits on self-report measures could be affected by callousness, which precludes insightful self-assessment of subjective affective states (Lilienfeld and Fowler, 2006).

Regarding confirmatory factor analyses, results indicated poor fit for the hypothesized model in the current sample and post-hoc exploratory analyses revealed poor, but improved fit, for a bifactor model in which items also loaded onto a general factor. While numerous studies have found good fit for a three-factor model in forensic and outpatient clinical samples, the results of this study echo a few others that have supported bifactor models (Zwaanswijk et al., 2017; Oshukova et al., 2015). The poor fit of the three-factor model may be explained by the unique characteristics of the sample (e.g., co-morbidity, described in more detail below) and/or the low internal consistency and poor inter-item correlations of some subscales. Indeed, modification indices (MI) were large and suggested scales load onto non-hypothesized factors, as seen in previous studies with non-forensic samples (Oshukova et al., 2015). Likewise, MI suggested correlating error terms, primarily with regard to scales across different factors. Notably, the Thrill Seeking, Dishonest Charm, and Lying subscales appeared numerous times in MI as scales that perhaps belonged on a different factor. Additionally, these three scales also suffered from the

lowest internal consistency values, suggesting that further analysis is warranted.

It is important to note that personality assessments often perform poorly when evaluated with confirmatory factor analysis, particularly when tested in new samples. Indeed, Hopwood and Donnellan (2010) are careful to note that the poor CFA performance of a personality measure should not be used as evidence that the measure does not function adequately nor to discredit the clinical utility or research findings based on that tool. Certainly, despite the aforementioned CFA results in the current study, the YPI and its factors demonstrated clinical utility. Indeed, findings supported convergent validity by showing significant, positive, and strong correlations among measures in expected directions (YPI total and factors and PAI-A-ANT). These findings largely mirror previous findings demonstrating significant associations between the YPI and other personality/psychopathology measures, such as the MMPI-2-RF scales related to psychopathic features (e.g., earlier onset delinquency, aggression, and institutional infractions; Andershed et al., 2002; Dolan and Rennie, 2006; Sellbom et al., 2016; Skeem and Cauffman, 2003) and the NEO PRI (i.e., Psychopathy Prototype score; Cauffman et al., 2009). Moreover, findings provided evidence that the YPI total possessed clinical utility in identifying, with moderate-to-high diagnostic accuracy, clinically significant antisocial features—despite the fact that the YPI is shorter, easier to access, and free of cost. Overall, results suggest that randomly selected youth with a score falling above the clinical threshold (60 or above) on the PAI-A-ANT would be highly likely to have a higher score on the YPI than a randomly selected youth with a score below the clinical threshold (59 or lower) on PAI-A-ANT.

Several limitations to the present study hinder the generalizability of the results and raise the need for future research. First, the unique characteristics of the sample (e.g., lack of ethnic diversity, high SES, and type of diagnoses) preclude meaningful comparisons with other clinical samples and raised the need for further research on more diverse samples. The current study did not examine the role of ethnicity or SES. Previous studies have found that while socioeconomic status is not associated with psychopathy (Zwaanwijk et al., 2018), it may be associated with antisociality (Piotroska et al., 2015). With respect to type of diagnoses and comorbid symptomatology, research has found that psychopathic traits are associated with anxiety symptoms (Blackburn, 2007). Thus, discriminant validity analyses in future research with clinical samples is recommended; particularly, because a large percentage of clinical samples meet criteria for mood disorders. Second, this study relied exclusively on self-report measures. Thus, shared method variance may have inflated correlations between the YPI and the PAI-A-ANT. Although the YPI avoids face validity issues by not portraying its items in an obviously negative manner, it is possible that participants could have engaged in impression management. Considering that impression management manifested through deception, malingering, and lying are core traits of psychopathy (Kucharski et al., 2006; Lilienfeld and Fowler, 2006), the PAI-A profiles identified as high in the impression management scales were not removed from the dataset in order to include participants with psychopathic traits that engaged in positive impression management. The relation between validity scales on clinical instruments and psychopathy in adolescents warrants future research in making psychopathy a meaningful target for assessment in clinical settings. Moreover, item-level data for the PAI-A was not available for this study, precluding internal consistency estimates—a significant limitation in our convergent validity analyses. Finally, this study did not examine the stability of psychopathy over time and cannot comment on matters of outcome prediction or developmental trajectory. Future studies should also include the assessment of psychopathy in adolescents obtained from multiple reports (e.g., caregivers, teachers, hospital and correctional staff).

Notwithstanding these limitations, the current study provides important information regarding the performance of the YPI in a clinical inpatient sample. In all, the YPI three factor structure was not replicated in the current sample, though fit was significantly improved by

a bifactor model. The YPI still demonstrated clinical utility identifying participants with significant antisocial traits. These results indicate that while the psychopathic traits in the current sample are not structured or grouped in three dimensions/factors, they are still significantly associated with antisociality despite their untidy structure. Our findings therefore suggest that while refinement of the YPI may be needed, the aspects of psychopathy it measures are important for clinical practice. As the first study to examine the psychometric properties of the YPI in inpatient adolescents, this study takes important first steps towards the use and refinement of the YPI for clinical purposes. In sum, this study provides empirical data regarding the early detection and assessment of psychopathic features in clinical populations, thus identifying specific psychometric issues in need of future research and contributing to the current absence of YPI data in clinical samples.

### Ethical standards

This study has been approved by the appropriate ethics committee and therefore performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All persons gave their informed consent prior to their inclusion in the study.

### Conflict of interest

The authors declare that they have no conflict of interest.

### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.03.031.

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