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Child Behavior Checklist Juvenile Bipolar Disorder (CBCL-JBD) and CBCL Posttraumatic Stress Problems (CBCL-PTSP) scales are measures of a single dysregulatory syndrome

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Background: The Child Behavior Checklist Juvenile Bipolar Disorder (CBCL-JBD) profile and Posttraumatic Stress Problems (CBCL-PTSP) scale have been used to assess juvenile bipolar disorder (JBD) and posttraumatic stress disorder (PTSD), respectively. However, their validity is questionable according to previous research. Both measures are associated with severe psychopathology often encompassing multiple DSM-IV diagnoses. Further, children who score highly on one of these scales often have elevated scores on the other, independent of PTSD or JBD diagnoses. We hypothesized that the two scales may be indicators of a single syndrome related to dysregulated mood, attention, and behavior. We aimed to describe and identify the overlap between the CBCL-JBD profile and CBCL-PTSP scales. **Method:** Two thousand and twenty-nine (2029) children from a nationally representative sample (1073 boys, 956 girls; mean age = 11.98; age range = 6–18) were rated on emotional and behavior problems by their parents using the CBCL. Comparative model testing via structural equation modeling was conducted to determine whether the CBCL-JBD profile and CBCL-PTSP scale are best described as measuring separate versus unitary constructs. Associations with suicidality and competency scores were also examined. **Results:** The CBCL-JBD and CBCL-PTSP demonstrated a high degree of overlap (r = .89) at the latent variable level. The best fitting, most parsimonious model was one in which the CBCL-JBD and CBCL-PTSP items identified a single latent construct, which was associated with higher parental endorsement of child suicidal behavior, and lower functioning. **Conclusions:** The CBCL-JBD profile and CBCL-PTSP scale overlap to a remarkable degree, and may be best described as measures of a single syndrome. This syndrome appears to be related to severe psychopathology, but may not conform to traditional DSM-IV classification. These results contribute to the ongoing debate about the utility of the CBCL-JBD and CBCL-PTSP profiles, and offer promising methods of empirically based measurement of disordered self-regulation in youth. **Keywords:** Assessment, Child Behavior Checklist, bipolar disorder, posttraumatic stress disorder. **Abbreviations:** CBCL: Child Behavior Checklist; JBD: juvenile bipolar disorder; PTSP: posttraumatic stress problems.

The assessment of bipolar disorder in children has been a controversial subject, not only in the scientific literature (Youngstrom, Meyers, Youngstrom, Calabrese, & Findling, 2006), but also in the media (Holden, 2008). Of the various measures for juvenile bipolar disorder (JBD), the Child Behavior Checklist-Juvenile Bipolar Disorder (CBCL-JBD) profile (Biederman et al., 1995) has been rigorously scrutinized in recent studies (Kahana, Youngstrom, Findling, & Calabrese, 2003; Youngstrom et al., 2006). The CBCL-JBD profile was first identified by Biederman and colleagues (1995) and verified through meta-analysis (Mick, Biederman, Pandina, & Faraone, 2003). It is defined by elevations on three of the CBCL syndrome scales: (1) Aggressive Behavior (AGG), (2) Anxious/Depressed (A/D), and (3) Attention Problems (AP), and a raw score can be computed by summing the scores from all three scales. Elevated scores on the CBCL-JBD profile have been associated with relatively high rates of suicidality (Althoff, Rettew, Faraone, Boomsma, & Hudziak, 2006), suggesting that the profile may be particularly useful as a predictor of severe psychopathology in youth.

However, questions remain as to whether it is in fact a measure of mania or bipolar disorder, or of some other form of psychopathology, such as severe mood dysregulation (Leibenluft, Charney, Towbin, Bhangoo, & Pine, 2003) or comorbidity (Carlson, Bromet, & Sievers, 2000). Although Biederman and colleagues have presented evidence that the CBCL-JBD profile distinguishes children with DSM-IV JBD from those with attention deficit hyperactivity disorder (ADHD; Biederman et al., 1995; Mick et al., 2003) and the raw score has been used in some samples to predict JBD (Faraone, Althoff, Hudziak, Monuteaux, & Biederman, 2005), others have questioned its validity and specificity (Kahana et al., 2003; Youngstrom et al., 2006). For example, Youngstrom and colleagues (2006) found that

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although children who meet criteria for DSM-IV JBD on parent-rated measures of mania score in the clinical range on the CBCL-JBD Profile, so do many children with other psychiatric disorders. Furthermore, these authors reported that the Externalizing Problems scale on the CBCL performed just as well as the proposed three-factor (AGG, AP, and A/D) JBD Profile in detecting juvenile mania (Youngstrom et al., 2006).

It is unlikely that the CBCL-JBD profile is an adequate measure of juvenile bipolar disorder as specified in the DSM-IV, but it may be better conceptualized as a measure of another form of severe psychopathology not currently well characterized in the DSM-IV nomenclature. Because of lack of clarity around this issue and to de-emphasize the controversial and possibly distracting link to JBD, we herein will call the CBCL-JBD profile simply the AAA Profile (AP/AGG/AD), reflecting its component parts.

Although the AAA Profile has shown strong associations with suicidal behavior and severe problems regulating behavior and affect (Althoff et al., 2006), its utility rests on our understanding of what it is. Given that the AAA Profile consists of three pre-existing CBCL scales, elevations of all three scales could plausibly indicate comorbid internalizing and externalizing problems, such as co-occurring ADHD or oppositional defiant disorder (ODD) and depression. Indeed, some have suggested that the AAA Profile is not a measure of any particular syndrome or disorder, but instead of complex comorbidity (Carlson et al., 2000). However, data from our latent class analysis (Althoff et al., 2006) and behavior genetics studies (Boomsma et al., 2006; Hudziak, Althoff, Derks, Faraone, & Boomsma, 2005) have demonstrated that the AAA Profile is distinct from each of its components either alone or in tandem (i.e., attention problems, anxious/depression, and aggression). Given the body of literature suggesting that the AAA Profile is indicative of neither JBD (Kahana et al., 2003; Youngstrom et al., 2006), nor ADHD, Internalizing, or Aggression (Althoff et al., 2006; Boomsma et al., 2006; Hudziak et al., 2005), there remain two viable answers to the question, '*What is the AAA Profile?*': (1) comorbid attention, behavior, and mood problems, or (2) a syndrome unto itself. If it is a distinct, identifiable syndrome, the use of the AAA Profile in clinical and research settings may significantly augment the assessment and treatment of severe psychopathology in youth, including suicidal behavior, which is challenging to predict and treat (Paris, 2006). Furthermore, the AAA Profile's associations with severe dysregulation of mood (Leibenluft et al., 2003) and behavior (Youngstrom et al., 2006) could suggest that such a syndrome represents a disorder of self-regulation across multiple domains (i.e., affect, attention, and behavior), but which may not easily fit into DSM-IV nosology.

With increased attention to the AAA Profile in research and clinical settings, we noticed that children with clinical scores on this Profile reliably had high scores on a new CBCL subscale, the CBCL-Posttraumatic Stress Problems Scale (CBCL-PTSP). Like the derivation of the AAA Profile, the CBCL-PTSP scale has been developed from items of the CBCL. It was purported to be a marker for PTSD, and is now included as a 'problem oriented scale' in the standard CBCL output (Achenbach & Rescorla, 2007). It is calculated using 14 pre-existing items on the CBCL, seven of which overlap with the AAA Profile. Surprisingly, the CBCL-PTSP scale does not assess for the occurrence of a traumatic event (Wolfe & Birt, 1997; see Table 1). Considering the potential for misdiagnosis, we were quite troubled by the frequency with which non-traumatized, non-bipolar children were receiving elevated CBCL-PTSP and AAA Profile scores. Upon examining the research literature on the CBCL-PTSP scale, we found that, similar to the history of JBD and its relation to the AAA Profile, studies demonstrate that the CBCL-PTSP scale does not differentiate between sexually abused children and children with other psychiatric disorders who have not been abused (Ruggiero & McLeer, 2000; Sim et al., 2005). These findings suggest that the CBCL-PTSP may identify a more general dimension of severe psychopathology that is not trauma-specific (Sim et al., 2005). Based on the literature, we hypothesized that the PTSP scale and AAA Profile are measuring a single, common syndrome, rather than PTSD and JBD, and that this syndrome is primarily characterized by clinically significant problems regulating mood, behavior, and attention. To test these ideas, we examined the latent similarities between the two measures, their associations after accounting for overall psychopathology, and their relations with measures of suicidality and impairment. Because the PTSP scale, unlike the AAA Profile, does not consist of entire CBCL syndrome scales and has relatively few items, extensive overlap at the latent level even after accounting for other psychopathology could provide evidence for the hypothesis that the AAA Profile represents a single syndrome, rather than comorbidity of attention problems, aggression, and anxious depression. Evidence of overlap would also give us confidence that the CBCL-PTSP is not a trauma specific scale but rather a short item list that taps the same latent variable identified by AAA Profile.

This study directly tested the relations of the AAA Profile and PTSP scale using structural equation modeling. We hypothesized that they measure the same latent construct. If confirmed, we may be on our way to answering the question, '*What is the AAA Profile?*'. In addition, confirmation of this hypothesis would add to the growing literature suggesting that clinicians and researchers should refrain from using the CBCL-PTSP scale and AAA Profile as measures of PTSD and JBD, respectively. The fits of the following

Table 1 CBCL-JBD and CBCL-PTSP items

CBCL-JBD items		CBCL-PTSP items	Shared JBD/PTSP items
^1. Acts too young for his/her age	^41. Impulsive or acts without thinking	9. Can't get his/her mind off certain thoughts (obsessions)	*+3. Argues a lot*
^4. Fails to finish things he/she starts	+57. Physically attacks people	11. Clings to adults or too dependent	*^8. Can't concentrate, can't pay attention for long*
^10. Can't sit still, restless, or hyperactive	^61. Poor school work	34. Feels others are out to get him/her	**31. Fears he/she might think or do something bad*
^13. Confused or seems to be in a fog	+68. Screams a lot	47. Nightmares	**45. Nervous, high-strung, or tense*
*14. Cries a lot	*71. Self-conscious or easily embarrassed	69. Secretive, keeps things to self	**50. Too fearful or anxious*
+16. Cruelty, bullying, or meanness to others	^78. Inattentive or easily distracted	103. Unhappy, sad, or depressed	**52. Feels too guilty*
^17. Daydreams or gets lost in his/her thoughts	^80. Stares blankly	111. Withdrawn, doesn't get involved with others	*+87. Sudden changes in mood or feelings*
+19. Demands a lot of attention	+86. Stubborn, sullen, or irritable		
+20. Destroys his/her own things	+88. Sulks a lot		
+21. Destroys things belonging to his/her family or others	+89. Suspicious		
+22. Disobedient at home	*91. Talks about killing self		
+23. Disobedient at school	+94. Teases a lot		
*29. Fears certain animals, situations, or places, other than school	+95. Temper tantrums or hot temper		
*30. Fears going to school	+97. Threatens people		
*32. Feels he/she has to be perfect	+104. Unusually loud		
*33. Feels or complains that no one loves him/her	*112. Worries		
*35. Feels worthless or inferior			
+37. Gets in many fights			

CBCL-JBD: Juvenile Bipolar Disorder scale of the Child Behavior Checklist; CBCL-PTSP: Post Traumatic Stress Problems scale of the Child Behavior Checklist; *Anxious/Depressed (A/D) item; +Aggressive Behavior (AGG) item; ^Attention Problems (AP) item.

three models were compared: (a) a two latent variable model with the latent variables uncorrelated; (b) a two latent variable model with latent variables correlated; and (c) a one latent variable model. We hypothesized that the best-fitting model would be one in which the overlap between the AAA Profile and PTSP scale is defined by a shared latent variable. If so, items and factor loadings would be examined in order to more accurately label and conceptualize the AAA Profile. Because a high correlation between the AAA and PTSP latent variables could be due to overall psychiatric comorbidity or reporting bias (i.e., a 'G' factor), we re-examined this association while accounting for scores on all other CBCL items using a latent variable ('G'). We hypothesized that the correlation between the AAA Profile and PTSP scale latent variables would not decrease in the context of 'G,' suggesting that commonalities between the AAA Profile and PTSP scale are indicative of a syndrome that is distinct from general, non-specific psychopathology or reporting bias. If, instead, the association between the AAA and PTSP latent variables decreases in the context of G, this would lend credence to the competing hypothesis that overlap between the AAA Profile and PTSP scale is due to either their representation of complex, comorbid psychopathology, or biased parental reporting. Finally, because both the AAA Profile and the PTSP scale have been associated with impaired competency scores and with suicidal thoughts or behavior (Althoff, Rettew, & Hudziak, 2007), associations between this common latent construct and the CBCL competency scales and suicidality items would also be estimated. In line with the literature demonstrating that these measures are associated with severe dysregulatory problems not specific to JBD or PTSD (Kahana et al., 2003; Sim et al., 2005), we hypothesized that this common latent variable would be significantly related to low functioning across multiple domains, and with endorsement of suicidal thoughts and behavior.

Method

Subjects

We used the 1999 CBCL national sample, which is representative of the 48 contiguous states (Achenbach & Rescorla, 2001). Parents of 2029 community children, including 276 children who had been referred for mental health services in the preceding 12 months, completed the CBCL during home interviews. Children ranged in age from 6 to18, with an overall mean age of 11.98 (SD = 3.53). The mean age of boys was 11.94 (SD = 3.56) and the mean age of girls was 12.02 (SD = 3.50). Of the 2029 children in this study, 1465 (72%) were rated by mothers, 445 (22%) by fathers, and 119 (6%) by another caregiver (e.g., step-parent). Children in this study were 60% Caucasian, 20% African-American, 9% Latino, and 11% Mixed or Other (Achenbach & Rescorla, 2001). Socioeconomic status (SES) was calculated based on the Hollingshead index (Hollingshead, 1975), a 9-step rating scale of the highest-status job in the household. Scores from 1.0 to 3.9 are considered 'lower,' 4.0 to 6.9 'middle,' and 7.0 to 9.0 'upper.' The sample consisted mainly of Middle SES participants, with 33% Upper, 51% Middle, and 16% Lower. Mean SES score was 2.2 (SD = .7; Achenbach & Rescorla, 2001). All participants provided informed consent.

Assessment of PTSP and JBD

Parents completed the *Child Behavior Checklist* (CBCL; Achenbach & Rescorla, 2001), rating their children on a three-point scale for 118 behavior problems. Specifically, a parent rates the behavior as a '0' if it is not present, a '1' if the child sometimes exhibits the symptom, and a '2' if the child frequently demonstrates the symptom. The 2001 version of the CBCL yields eight psychopathology scales (Aggressive Behavior, Anxious/Depressed, Attention Problems, Rule-Breaking Behavior, Social Problems, Somatic Complaints, Thought Problems, and Withdrawn/Depressed) and three broad scales: Internalizing, Externalizing, and Total Problems. It also includes four competency scales: Activities, Social, School, and Total Competency. The raw PTSP scale score is calculated by adding ratings on 14 items (see Table 1). The raw AAA Profile scores are typically calculated by examining ratings on the Attention Problems, Aggression, and Anxious/Depressed scales. Alternatively, the raw scores on the 41 items comprising these three scales can be summed to calculate an AAA Profile 'scale' score (see Table 1). To maximize power for structural equation modeling, individual items were used rather than total scale/profile scores. All items were recoded into dichotomous variables such that a response of 1 or 2 on the three-point scale (i.e., indicating at least some presence of that behavior) was coded as 1, and a response of 0 remained a 0. This convention has been applied in the development of these subscales (Achenbach & Rescorla, 2001). Items common to both scales ($N = 7$; items 3, 8, 31, 45, 50, 52, and 87) were initially excluded so that any commonality between the AAA Profile and PTSP scale would not be inflated due to overlapping content. However, these 7 items were included in follow-up analyses as described below.

Data analysis

Ten models were tested, using MPlus (Muthén & Muthén, 2005), to examine the association between the AAA Profile and PTSP scale. The WLSMV (weighted least squares mean and variance adjusted) estimation method was used in all analyses to account for the categorical item scores. Fit criteria were based on the recommendations of Hu and Bentler (1999), where a Root Mean Square Error of Approximation (RMSEA) of less than .08 indicates reasonable model fit, and .06 good model fit. The RMSEA indicates 'badness of fit,' where a higher RMSEA implies worse fit, and zero would indicate the best fit (Kline, 2005). The Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) are also reported, but recent research suggests that the RMSEA

is a more reliable index of fit, especially using the WLSMV estimation method (Yu, 2002). A CFI or TLI of .95 is considered very good fit, and .90 adequate fit (Hu & Bentler, 1999). CFI and TLI range from 0 to 1, with higher values indicating better fit (Kline, 2005). However, a CFI or TLI equal to 1.0 means that the χ^2 value is less than the degrees of freedom for the model rather than that the model fits the data perfectly (Kline, 2005).

First, models 1 and 2 (see Figure 1) were estimated to test whether the 34 non-overlapping AAA Profile items and 7 non-overlapping PTSP scale items (see Table 1) would load onto single latent 'AAA' and 'PTSP' variables. In model 3 (see Figure 1), a correlational path between the latent 'AAA' and 'PTSP' variables, which were each identified by their relevant items (N = 34 for AAA Profile, N = 7 for PTSP scale), was added. Next, in model 4 (see Figure 1), the correlation between latent variables 'AAA' and 'PTSP' was set to zero. Any difference in fit of models 3 and 4 was hypothesized to be indicative of whether 'AAA' and 'PTSP' were in fact different latent constructs. If model 4 fit the data but model 3 did not, this would suggest that 'AAA' and 'PTSP' are distinct constructs. If the reverse was true, depending on the size of the correlation, 'AAA' and 'PTSP' may be best conceptualized as a single construct.

To more directly examine whether the AAA Profile and PTSP scale are measuring distinct latent constructs, we estimated the fit of a single-latent variable model (model 5; see Figure 2). For this model, all non-overlapping AAA Profile and PTSP scale items (N = 41; see Table 1) were together entered as indicators of a single latent variable, which was named 'LV1' for the purposes of the current study. A good fit of this model would provide evidence for the hypothesis that the AAA Profile and PTSP scale are measuring a single, common construct.

To test the possibility that the association between latent variables 'PTSP' and 'AAA' could be due to overall reporting bias, or general psychopathology, model 6 was estimated to examine the association between 'PTSP' and 'AAA' after accounting for a 'general psychopathology' latent variable ('G') identified by the dichotomously coded CBCL items (N = 70) that are not included on the AAA Profile or PTSP scale (see Figure 2). If the correlation between 'PTSP' and 'AAA' significantly decreased once this additional latent variable was accounted for in the model, one might conclude that the AAA Profile and PTSP scale overlap due to higher psychopathology in general or an underlying reporting bias inherent to the CBCL. In contrast, if the correlation between the 'PTSP' and 'AAA' latent variables did not change, it would be unlikely that reporting bias explains their commonalities.

Although excluding overlapping items is a conservative approach, it leaves the possibility that the AAA Profile and PTSP scale as computed here are qualitatively different from those used in previous research. Therefore, models 3 through 6 (named 3a–6a) were run again, this time including all 14 PTSP scale items as 'PTSP' observed variables and the 34 non-overlapping AAA Profile items as 'AAA' observed variables.

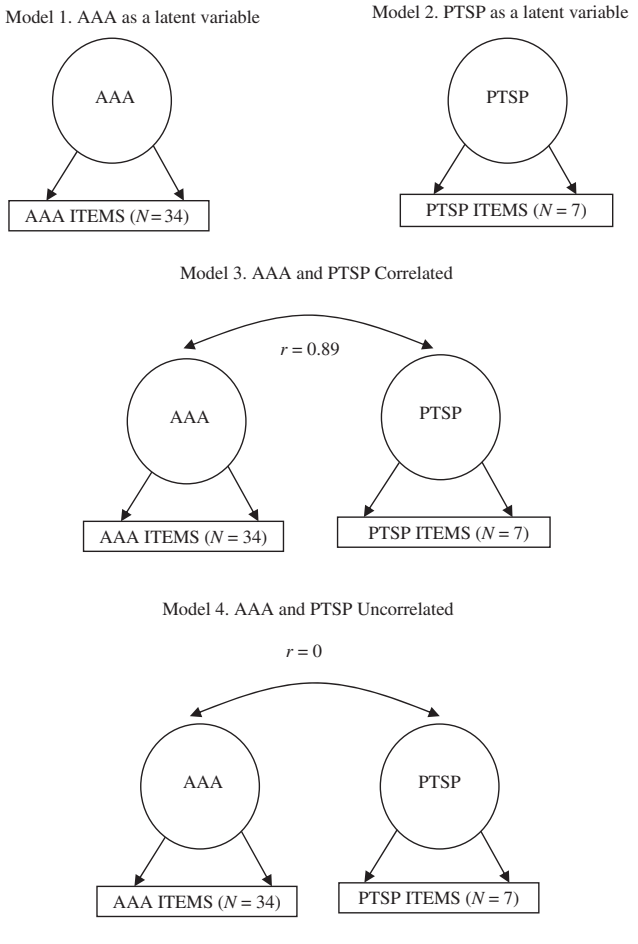

Figure 1 AAA and PTSP as latent variables identified by their non-overlapping items (Models 1 & 2), correlated (Model 3) and uncorrelated (Model 4)

Results

Models excluding 7 overlapping items

Models 1, 2, 3, 5, and 6 converged easily, fit the data, and had no out-of-range parameters. Model 4, where the correlation between latent variables 'AAA' and 'PTSP' was set to 0, did not fit the data (see Table 2). The single-latent variable ('LV1') model (model 5) fit the data as well as the two-latent-variable model (model 3). In model 3, the correlation between variables 'AAA' and 'PTSP' was high (r = .89), and remained high (r = .89) in model 6 when general reporting bias (latent variable 'G') was accounted for.

Although models 3 and 5 both demonstrated good fit, model 5 is the more parsimonious model and therefore the most acceptable one.

Models including 7 overlapping items

In the models estimated while including the 7 overlapping items as indicators of the PTSP latent variable, results were nearly identical to those excluding these items. Models 3a, 5a, and 6a again converged easily, fit the data, and had no out-of-range parameters. Model 4a did not fit the data (see Table 2). The single-latent-variable model (model 5a) again fit the data as well as model 3a. The correlation between latent variables 'AAA' and 'PTSP' was high (r = .96) and remained high (r = .95) when 'G' was accounted for.

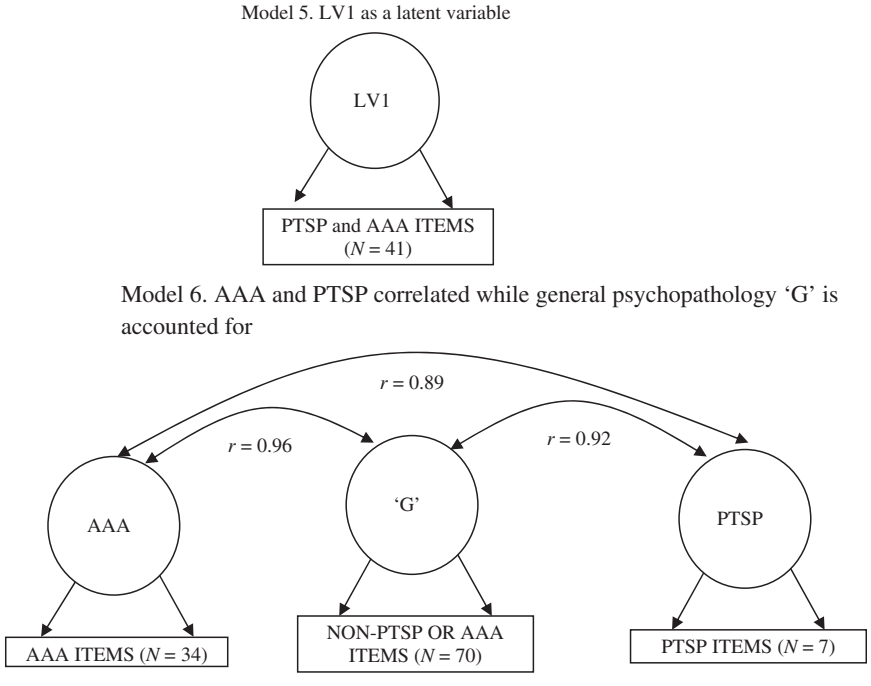

Figure 2 Non-overlapping AAA and PTSP items defined by one latent ('LV1') latent variable (Model 5) and non-overlapping AAA and PTSP correlated while general psychopathology 'G' is accounted for (Model 6).

Table 2 Model testing

Model	χ^2 (df)*	*p*	CFI	TLI	RMSEA
1. N/O AAA as an LV	2143.71 (267)	.00	.858	.931	.059
2. N/O PTSP as an LV	68.69 (13)	.00	.959	.949	.046
3. N/O LVs Correlated	2640.27 (340)	.00	.843	.926	.058
3a. Inclusive LVs Correlated	3464.19 (399)	.00	.814	.919	.062
4. N/O LVs, Correlation @ 0	8397.63 (268)	.00	.447	.670	.122
4a. Inclusive LVs, Correlation @ 0	13597.08 (276)	.00	.190	.490	.154
5. One Common LV (N/O items only)	2671.64 (340)	.00	.841	.925	.058
5a. Inclusive One Common LV	3476.77 (399)	.00	.813	.918	.062
6. Accounting for 'G' (N/O items only)	2838.53 (521)	.00	.810	.882	.047
6a. Accounting for 'G' (all items included in model)	3071.43 (554)	.00	.814	.887	.047

N/O: Non-overlapping; AAA: Juvenile Bipolar Disorder; LV: Latent Variable; PTSP: Posttraumatic Stress Problems; G: General Reporting Bias.
*Note: χ^2 and df are not normally distributed, and are not computed in the regular way (Muthén, 1998–2004; Yu, 2002)

To investigate the meaning of this latent variable, the 48 CBCL item indicators and their factor loadings onto 'LV1' were examined. All loadings were significant ($p < .01$) and those with the highest 30 loadings are listed in Table 3. To determine the prevalence of this potential 'dysregulation' syndrome, we computed the sum of the raw scores on all AAA Profile and PTSP scale items. Based on these scores, 331 (16.3%) of youth in this sample had raw scores at or above one standard deviation (SD = 8.56) above the mean (M = 11.72). Ninety-nine (4.9%) participants had raw scores at or above two standard deviations above the mean.

Associations with suicidal behavior

Once it was determined that the one-latent-variable model was the most acceptable due to fit and parsimony, the relations between 'LV1' and suicidal-behavior-related CBCL items were explored. The 7 overlapping items were included as observed variables for 'LV1' in these analyses. There are two CBCL items that assess suicidal behavior: item 18 ('Harms Self') and item 91 ('Thinks/Talks about Suicide'). Specifically, four models were tested: (1) Item 18 regressed onto the single latent variable, (2) item 91 regressed onto the single latent variable, (3) item 18 regressed onto the single latent variable after accounting for 'G,' and (4) item 91 regressed onto the single latent variable after accounting for 'G.' These items were dichotomously coded (0 = no, 1 = yes) as described above. For these analyses, the item serving as the dependent variable (item 18 or 91) was removed as a 'G' or 'LV1' observed variable in order to avoid false inflation of associations. These analyses revealed that 'LV1' was highly predictive of items 18

Table 3 Highest 30 factor loadings for items on 'LV1' latent variable, including overlapping items

Item	Item label	Factor loading	Item	Item label	Factor loading
97	Threatens people (B)	.79	20	Destroys his/her own things (B)	.69
78	Inattentive or easily distracted (C)	.73	87	Sudden changes in mood or feelings (E)	.68
86	Stubborn, sullen, or irritable (E)	.73	21	Destroys things belonging to his/her family or others (B)	.68
22	Disobedient at home (B)	.73	68	Screams a lot (B)	.67
41	Impulsive or acts without thinking (B/C)	.72	19	Demands a lot of attention (B)	.63
91	Talks about killing self (C/E)	.72	13	Confused or seems to be in a fog (C)	.62
95	Temper tantrums or hot temper (E)	.72	50	Too fearful or anxious (E)	.62
88	Sulks a lot (E)	.71	3	Argues a lot (B)	.62
57	Physically attacks people (B)	.71	104	Unusually loud (B)	.62
16	Cruelty, bullying, or meanness to others (B)	.71	23	Disobedient at school (B)	.62
34	Feels others are out to get him/her (C)	.70	89	Suspicious (E/C)	.61
8	Can't concentrate, can't pay attention (C)	.70	45	Nervous, high strung, or tense (E)	.61
103	Unhappy, sad, or depressed (E)	.70	61	Poor school work (C/B)	.61
35	Feels worthless or inferior (E)	.69	10	Can't sit still, restless, or hyperactive (B)	.60
33	Feels or complains that no one loves him/her (E)	.69	80	Stares blankly (B/C)	.57

B: Behavior-related item; C: Cognition-related item; E: Emotion-related item; B/C: Behavior- and Cognition-related item; C/E: Cognition- and Emotion-related item.

(OR = 3.5, $p < .0001$) and 91 (OR = 4.0, $p < .0001$), even when 'G' is accounted for (item 18: OR = 3.5, $p < .0001$; item 91: OR = 3.8, $p < .0001$).

Associations with CBCL competency scales

To further explore the meaning and clinical significance of this single 'LV1' latent variable, its associations with the CBCL competency scales (Activities, School, Social, and Total Competency) were examined. Again, indicators of 'LV1' included the 7 overlapping items. Competency scores in the borderline or clinically significant range (T < 35 for Activities, School, Social; T < 40 for Total Competency) were recoded as '1,' and those in the normal range were recoded as '0.' 'LV1' was significantly associated with low competency in Activities (OR = 1.2, $p = .01$), School (OR = 2.4, $p < .0001$), Social (OR = 2.0, $p < .0001$), and Total Competencies (OR = 1.9, $p < .0001$). After accounting for 'G,' 'LV1' remained associated with low competency in Activities (OR = 1.3, $p = .01$), School (OR = 2.4, $p < .0001$), Social (OR = 2.0, $p < .0001$), and Total Competencies (OR = 1.9, $p < .0001$).

Discussion

Scores on the AAA Profile and PTSP scale have been purported to assess two separate disorders across two different diagnostic categories, JBD (Biederman et al., 1995; Mick et al., 2003) and PTSD (Wolfe & Birt, 1997). However, their validity as measures of JBD and PTSD has been questioned (Kahana et al., 2003; Ruggiero & McLeer, 2000; Sim et al., 2005; Volk & Todd, 2007; Youngstrom et al., 2006). Based on the empirical evidence that false positives do occur using the AAA Profile and PTSP scale to diagnose DSM-IV JBD and PTSD in children (Kahana et al., 2003; Ruggiero & McLeer, 2000), this study aimed to first identify the extent to which the AAA Profile and PTSP scale overlap or are distinct. Structural equation modeling confirmed our hypothesis that the AAA Profile and PTSP scale are indeed best described as measuring a common underlying construct that is not accounted for by overall psychopathology load or reporting bias. This study presents a logical resolution to the debate over whether these measures are to be used to 'diagnose' JBD or PTSD. They are not. Both the AAA Profile and PTSP scale seem to identify children and adolescents who meet criteria for DSM-IV JBD and PTSD in some cases, but also many other youths with other psychiatric disorders (Ruggiero & McLeer, 2000). Because the PTSP scale is not a combination of full CBCL syndrome scales, its similarity with the AAA Profile also provides evidence that the AAA Profile is reflective of a single syndrome, rather than of comorbid ADHD, ODD, and internalizing problems.

Our second aim was to further explore the common latent variable 'LV1' that underlies the AAA Profile and PTSP scale. By examining the factor loadings of CBCL items on 'LV1' and the latent variable's associations with suicidal behavior and competencies, we hoped to augment previous studies aiming to determine how youth with clinical-range scores on the AAA Profile and PTSP scale may be best characterized (Biederman et al., 1995; Mick et al., 2003; Ruggiero & McLeer, 2000; Sim et al., 2005). The factor loadings of the CBCL items included on the AAA Profile and PTSP scale suggest that 'LV1' encompasses symptoms related to both internalizing and externalizing symptoms, and to problems with mood, behavior, and cognition. For example, some of the highest factor loadings were

for items 78 ('Inattentive or easily distracted'), 103 ('Unhappy, sad, or depressed'), 91 ('Talks about killing self'), and 22 ('Impulsive or acts without thinking'). Looking forward, factor analysis could be used to determine whether other structural models better fit the data. For example, items could be grouped based on their relation to behavior, cognition/attention, or emotion, rather than the AAA Profile and PTSP scale or a single 'LV1' construct.

Associations between 'LV1' and suicidal behavior and competencies were also examined. These analyses revealed that, even after accounting for psychiatric morbidity or reporting bias ('G'), 'LV1' is highly related to endorsement of the items 'Talks about killing self' and 'Harms self' on the CBCL. Furthermore, 'LV1' was associated with clinical-range scores on all CBCL competency scales (School, Social, Activities, & Total Competency). Therefore, the AAA Profile and PTSP scale, if combined into a single measure, may be useful in clinical and research settings as an indicator of high-risk behavior and low functioning in youth.

This study has several methodological strengths that make it a useful and important step toward future child and adolescent psychiatry and psychology research. First, the large sample consists of both clinic-referred and non-referred children, is demographically diverse, and is representative of the general population. Second, it is the same sample upon which other CBCL scales were developed. Third, error and alternative hypotheses have been tested using structural equation modeling. These factors strengthen the generalizability of the findings.

Along with the aforementioned strengths, several limitations must be noted. First, it is possible that the results found here are partially due to the large sample size. Given the magnitude of the effects found, this appears unlikely, but replication in other samples with different demographic characteristics is needed. Second, it is not yet possible to conclude that the common latent variable underlying the AAA Profile and PTSP scale is a single syndrome. Future research could examine the components of this latent variable and, as mentioned previously, conduct factor analyses to determine whether alternative distinctions between items (rather than AAA Profile and PTSP scale) provide a better fit to the data. Furthermore, the most rigorous model comparison procedure would be to conduct a chi-square difference test to determine whether the two- or one-factor model provides the best fit to the data. However, we cannot conduct such a test because these models are not nested. Instead, based on the nearly identical fit indices and rules of parsimony, we concluded that the one-latent-variable model is the best fit. This is not to say that a two-latent-variable model doesn't also represent the data well. For example, height and weight are two highly correlated indices that provide unique information. However, body mass index (BMI) captures both height and weight, and is most predictive of health risk. We believe the same may be true in the current study; that the one-factor model will be more useful as a measure of psychopathology, particularly in light of the psychometric weaknesses of the AAA Profile and PTSP scale (Sim et al., 2005; Youngstrom et al., 2006). Third, the question, '*What is the AAA Profile?*' has not been fully answered in this study. However, we have provided some evidence that it is a single syndrome, and not comorbidity. Our results also demonstrate that the latent construct underlying the AAA Profile and PTSP scale is clinically relevant and predictive of severe psychopathology. Based on high factor loadings cutting across behavioral, emotional, and cognitive areas, and based on the associations with suicidality, it is possible that the AAA Profile and PTSP scale are best described as measures of a disorder of self-regulation. Previous research has shown that severe dysregulation of mood, behavior, and cognition in youth can set the stage for severe psychiatric illness that may be labeled as bipolar disorder, borderline personality disorder, complex PTSD, or comorbid Axis I and/or II psychopathology (Baumeister & Vohs, 2004; Cloitre, 2005; Dickstein & Leibenluft, 2006; Linehan, 1993; Thorberg & Lyvers, 2005). Future studies that compare the AAA Profile and PTSP scale to established measures of dysregulation, including temperamental measures, laboratory measures, functional measures, and others, are necessary to confirm this hypothesis.

It is noteworthy that the AAA Profile and PTSP scale do not appear to be indicative of a particular DSM-IV diagnosis. Some may see this as a limitation. However, while clinicians must use the prevailing clinical criteria to make diagnoses and treat patients, the research community should continue to explore new ways to measure, conceptualize, and investigate severe psychopathology. It has been demonstrated, for example, that DSM categories inadequately capture the range and severity of psychopathology in children (Hudziak, Achenbach, Althoff, & Pine, 2007). Although not consistent with the DSM-IV, the re-conceptualization of the AAA Profile and PTSP scale proposed in this paper may be consistent with the proposed DSM-V, which is considering dimensional characterizations.

Further research that augments the current study in the examination of the AAA Profile and PTSP scale as indicators of dysregulation or another syndrome has the potential to significantly improve the assessment, prevention, and treatment of severe child and adolescent psychopathology. Because the CBCL is widely used, many research groups could simply reorganize their already-collected data to examine the questions raised in this study. These

results offer important implications for future research and clinical endeavors in the area of child and adolescent psychopathology.

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Key points

- The CBCL-JBD and CBCL-PTSP scales have questionable validity as measures of bipolar disorder and posttraumatic stress disorder.
- The current study demonstrates that the two scales are best described as measures of a single underlying syndrome.
- This syndrome is associated with suicidal behavior and low functioning across several domains.
- It is recommended that the CBCL-JBD and CBCL-PTSP scales *not* be used to assess bipolar disorder and posttraumatic stress disorder in youth.
- These scales might be better conceptualized as indicators of a disorder of self-regulation.

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