The differential predictive power of self vs. parent report in adolescent inpatients

Craig D. White, B.S., Robert W. Seals, M.A., Carla Sharp, Ph.D., Stephanie A. Kovacs, M.A.
Developmental Psychopathology Lab
Department of Psychology
University of Houston

UNIVERSITY of HOUSTON

Background

• The Child Behavior Checklist (CBCL) and Youth Self Report (YSR) are two widely used measures that were developed to assess psychopathology in children and teenagers (Achenbach et al, 1991).

• These measures have demonstrated remarkable utility, particularly in their ability to distinguish between referred and nonreferred populations (Aschenbrand et al, 2005; Morgan & Cauce, 1999).

• One initial drawback to the use of these measures, however, was the discordance of the empirically derived scales (the Syndrome Scales) with the nosology of DSM-IV diagnoses. The concern raised by this drawback was that the DSM classification system forms the basis for most psychopathology research, treatment protocols, and mental health services reimbursement eligibility.

• Theoretically derived DSM-Oriented scales were developed for the CBCL and YSR from existing items in order to address this discordance (Achenbach et al, 2003), and as of yet these newer scales have been subject to much less investigation (Vreugdenhil et al, 2006; Nakamura et al, 2009).

• Research with inpatient samples is particularly important in that the prevalence of psychiatric diagnoses is typically different in inpatient than in normative samples, affecting the utility of diagnostic instruments.

Aim of the Current Study

• **To examine the diagnostic utility of the standardized clinical cutoffs for the DSM-Oriented scales of the Child Behavior Checklist (CBCL) and the Youth Self Report (YSR) in predicting DSM-IV diagnoses obtained via the Computerized Diagnostic Interview Schedule for Children (CDISC) in an inpatient psychiatric sample of adolescents.**

  • In order to achieve this aim, the performance of subscales of the YSR and CBCL will be evaluated through receiver operating characteristic (ROC) analysis.

  • The sensitivity and specificity of a range of t-score clinical cut off points will be presented and clinical and research implications will be discussed.

Participants

• 171 patients of the Adolescent Treatment Program (ATP) of the Menninger Clinic in Houston, Texas.

• 41.5% male, mean age = 15.7 (SD = 1.42, range 12 – 17).

• 90.6% Caucasian, while other ethnic groups made up the remainder (3.5% Hispanic; 1.8% Asian; 1.2% African American; 1.2% biracial). Also see **table 1 and table 2.**

Procedure

• Consent to participate in research was obtained from participants and their parents.

• Participants completed the YSR and the CDISC-Y within two weeks of admission upon intake to the ATP as part of a larger battery.

• Parents completed the CBCL along with other parent-report measures as part of the ATP intake battery.

Measures

• *Child Behavior Checklist (CBCL) and Youth Self Report (YSR).* Questionnaires of psychopathology completed by parents and their children (Achenbach et al, 1991).
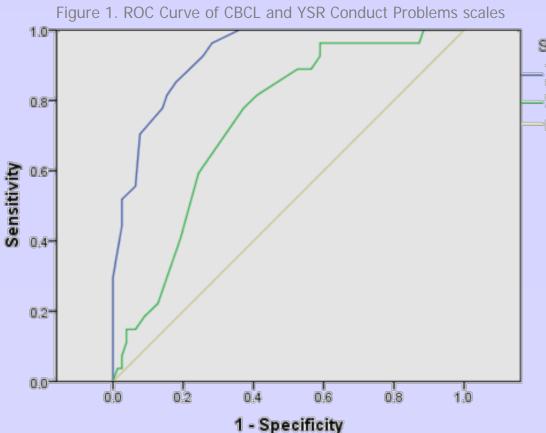
  • 112 items covering a range of problematic behaviors in youth, rated on a three-point, Likert-type scale, upon which respondents describe the prevalence or degree of the behaviors exhibited by the child as either (0)= not true, (1)= somewhat or sometimes true, or (2)= very true or often true.

  • For the current study, five out of the six theoretically derived DSM-Oriented scales were used:

    • Affective Problems (Dysthymic and Major Depressive Disorders)

    • Anxiety Problems [Generalized Anxiety Disorder (GAD), Separation Anxiety Disorder (SAD), and Specific Phobia (SPEC)]

    • Attention/Deficit/Hyperactivity Problems (Hyperactive-Impulsive and Inattentive subtypes)

    • Conduct Problems [Conduct Disorder (CD)]

    • Oppositional Defiant Problems [Oppositional Defiant Disorder (ODD)]

• *Diagnostic Interview Schedule for Children: Youth Version (CDISC-Y).* Highly structured interview of symptomology in children and adolescents.

  • Epidemiology and presence of disorders for twelve months prior to assessment are evaluated via DSM diagnoses.

  • Research has shown that as children enter adolescence, the reliability of self-report increases while the validity of parent-report decreases, for most types of psychopathology. (Kamphaus & Frick, 2002)

  • Strong reliability and validity for DISC-Y diagnoses have been evidenced through findings in previous research (Johnson et al, 1999).

Table 1. Mean t-scores for YSR and CBCL scales

DSM-Oriented Scale	YSR (N = 157)	CBCL (N = 151)
Affective	67.69 (12.26)	75.32 (9.36)
Anxiety	61.00 (9.24)	66.03 (8.84)
ADHD	60.86 (8.04)	63.73 (7.94)
CD	62.36 (9.65)	64.87 (8.30)
ODD	60.99 (8.94)	63.62 (8.84)

Table 2. Percentage of sample meeting diagnosis (via CDISCY)

Diagnosis	percent positive
Dysthymia	1.8
MDD	45.5
GAD	12.0
SAD	17.1
SPEC	17.2
ADHD	16.1
CD	25.9
ODD	23.2

Analysis

• Receiver operating curve (ROC) analyses were performed using SPSS 17. The criterion for these analyses was a positive diagnosis via the CDISC-Y.

• By computing sample base-rates for given diagnoses, we also examined positive predictive power (PPP) and negative predictive power (NPP) for a range of cutpoints on the CBCL and YSR.

Table 3. Operating characteristics for CBCL and YSR cutpoints

DSM Diagnosis	CBCL AUC	Sensitivity	Specificity	PPP	NPP	DSM Diagnosis	YSR AUC	Sensitivity	Specificity	PPP	NPP
MDD						**MDD**					
T ≥ 73.5	0.696	0.745	0.508	0.56	0.70	T ≥ 66.5	0.798	0.766	0.678	0.67	0.78
T ≥ 74.5	0.696	0.723	0.627	0.62	0.73	T ≥ 68	0.798	0.745	0.712	0.68	0.77
T ≥ 76	**0.696**	**0.702**	**0.678**	**0.65**	**0.73**	**T ≥ 69.5**	**0.798**	**0.702**	**0.814**	**0.76**	**0.77**
T ≥ 77.5	0.696	0.617	0.712	0.64	0.69	T ≥ 71	0.798	0.596	0.814	0.73	0.71
T ≥ 78.5	0.696	0.553	0.746	0.64	0.67	T ≥ 72.5	0.798	0.574	0.814	0.72	0.70
GAD						**GAD**					
T ≥ 65	0.537	0.667	0.426	0.14	0.90	T ≥ 55.5	0.664	0.833	0.447	0.17	0.95
T ≥ 67	0.537	0.667	0.447	0.14	0.91	T ≥ 57.5	0.664	0.833	0.500	0.19	0.96
T ≥ 69	**0.537**	**0.667**	**0.500**	**0.15**	**0.92**	**T ≥ 61**	**0.664**	**0.833**	**0.574**	**0.21**	**0.96**
T ≥ 70.5	0.537	0.500	0.596	0.14	0.90	T ≥ 63.5	0.664	0.667	0.649	0.21	0.93
T ≥ 71.5	0.537	0.417	0.649	0.14	0.89	T ≥ 66	0.664	0.583	0.691	0.20	0.92
SAD						**SAD**					
T ≥ 63	0.630	0.842	0.414	0.23	0.93	T ≥ 61	0.753	0.789	0.598	0.29	0.93
T ≥ 65	0.630	0.789	0.460	0.23	0.91	T ≥ 63.5	0.753	0.684	0.678	0.31	0.91
T ≥ 67	**0.630**	**0.789**	**0.483**	**0.24**	**0.92**	**T ≥ 66**	**0.753**	**0.684**	**0.736**	**0.35**	**0.92**
T ≥ 69	0.630	0.737	0.529	0.24	0.91	T ≥ 69	0.753	0.474	0.805	0.33	0.88
T ≥ 70.5	0.630	0.526	0.609	0.22	0.86	T ≥ 71	0.753	0.316	0.862	0.32	0.86
SPEC						**SPEC**					
T ≥ 52	0.534	0.882	0.112	0.17	0.82	T ≥ 55.5	0.763	0.941	0.483	0.27	0.98
T ≥ 54	0.534	0.882	0.124	0.17	0.84	T ≥ 57.5	0.763	0.882	0.528	0.28	0.96
T ≥ 56.5	**0.534**	**0.882**	**0.213**	**0.19**	**0.90**	**T ≥ 61**	**0.763**	**0.882**	**0.607**	**0.32**	**0.96**
T ≥ 59	0.534	0.824	0.247	0.19	0.87	T ≥ 63.5	0.763	0.706	0.674	0.31	0.92
T ≥ 61	0.534	0.706	0.292	0.17	0.83	T ≥ 66	0.763	0.647	0.719	0.31	0.91
ADHD						**ADHD**					
T ≥ 64	0.671	0.813	0.472	0.23	0.93	T ≥ 58.5	0.820	0.938	0.528	0.28	0.98
T ≥ 65.5	0.671	0.750	0.562	0.25	0.92	T ≥ 61.5	0.820	0.875	0.640	0.32	0.96
T ≥ 66.6	**0.671**	**0.688**	**0.640**	**0.27**	**0.91**	**T ≥ 64.5**	**0.820**	**0.813**	**0.708**	**0.35**	**0.95**
T ≥ 67.5	0.671	0.500	0.674	0.23	0.88	T ≥ 66.5	0.820	0.688	0.764	0.36	0.93
T ≥ 68.5	0.671	0.500	0.719	0.25	0.88	T ≥ 67.5	0.820	0.688	0.809	0.41	0.93
CD						**CD**					
T ≥ 64.5	0.737	0.889	0.474	0.37	0.92	T ≥ 59.5	0.926	1.000	0.551	0.44	1.00
T ≥ 65.5	0.737	0.815	0.590	0.41	0.90	T ≥ 61	0.926	1.000	0.641	0.49	1.00
T ≥ 66.5	**0.737**	**0.778**	**0.628**	**0.42**	**0.89**	**T ≥ 63**	**0.926**	**0.963**	**0.718**	**0.54**	**0.98**
T ≥ 67.5	0.737	0.667	0.705	0.44	0.86	T ≥ 65	0.926	0.926	0.744	0.56	0.97
T ≥ 68.5	0.737	0.593	0.756	0.46	0.84	T ≥ 66.5	0.926	0.852	0.821	0.62	0.94
ODD						**ODD**					
T ≥ 57	0.727	1.000	0.321	0.31	1.00	T ≥ 55.5	0.810	0.917	0.469	0.34	0.95
T ≥ 58.5	0.727	0.958	0.407	0.33	0.97	T ≥ 58	0.810	0.875	0.580	0.39	0.94
T ≥ 60.5	**0.727**	**0.917**	**0.519**	**0.37**	**0.95**	**T ≥ 60.5**	**0.810**	**0.792**	**0.679**	**0.43**	**0.92**
T ≥ 62.5	0.727	0.833	0.568	0.37	0.92	T ≥ 63	0.810	0.708	0.728	0.44	0.89
T ≥ 65	0.727	0.708	0.605	0.35	0.87	T ≥ 67	0.810	0.583	0.815	0.49	0.87

Note. Bolded rows indicate maximum sensitivity + specificity.

• ROC analysis yields a statistic, area under the curve (AUC) which spans from .500 (chance, a scale with no predictive value) to 1.00 (perfect prediction. **Figure 1** is an example of ROC curve graphical output from the current data, which charts sensitivity by 1- specificity.

Figure 1. ROC Curve of CBCL and YSR Conduct Problems scales

Source of the Curve
YSR Conduct Problems T score
CBCL Conduct Problems T score
Reference Line

Results

• ROC analyses indicated poor to fair AUCs across diagnoses for the CBCL, and fair to excellent AUCs across diagnoses for the YSR.

• Sensitivity, Specificity, PPP, and NPP are presented for a range of cutpoints in **table 3**. The cutpoint which maximizes sensitivity + specificity is presented in bold.

• Dysthymia was excluded from analysis due to the low percentage of subjects meeting diagnostic criteria.

Discussion

• The results suggest that both the CBCL and YSR showed adequate discrimination of cases for externalizing problems (ODD and CD), but that the YSR was superior for classifying youth with internalizing problems (MDD, GAD, SAD, Specific Phobia) and for ADHD.

  • Across diagnoses (with the exception of MDD for the YSR and MDD, GAD, and SAD for the CBCL), the score which maximized sensitivity + specificity tended to be somewhat lower than the published clinical cutoff of T = 70, most likely due to these disorders having base-rates much lower than 50%.

  • Positive predictive power (PPP) was low for those diagnoses with base-rates much lower than 50% (i.e., all diagnoses except MDD).

  • Clinicians might consider using a lower clinical cutoff score for these diagnoses in inpatient samples, although research with more diverse inpatient samples is necessary to help establish generalizability.

• Limitations: **The use of the CDISC-Y but not the CDISC-P as the criterion measure resulted in higher AUCs with the YSR than with the CBCL.**

  • Higher agreement due to shared method variance.

  • Future research should include analyses using the alternate criterion measures and investigate the relative contribution of the CBCL and YSR to diagnosis.

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