Diagnostic Screening With Incarcerated Youths: Comparing the DPS and Voice DISC

Larkin S. McReynolds, Gail A. Wasserman, Prudence Fisher and Christopher P. Lucas

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DIAGNOSTIC SCREENING WITH INCARCERATED YOUTHS

Comparing the DPS and Voice DISC

LARKIN S. McREYNOLDS
GAIL A. WASSERMAN
PRUDENCE FISHER
Columbia University

CHRISTOPHER P. LUCAS
New York University Child Study Center

In the first examination in a juvenile justice setting, associations between the DISC Predictive Scales (DPS) and the Voice Diagnostic Interview Schedule for Children in identifying mental health concerns were investigated. Assessment center youth (N = 195) completed computerized versions of both instruments. Psychometric properties and logistic regression estimates for diagnostic clusters were examined, and DPS summary subscales to derive cut points for incarcerated youths were created. DPS consistently identified higher percentages of youths. At the cluster level, there was considerable concordance, with agreement higher for the same diagnostic constructs, even after statistical adjustment. Summary subscale cut points identified ≥ 82% of disordered youths. Given recommendations for universal screening in corrections, the DPS offers advantages over existing screens as a component of mental health assessment.

Keywords: juvenile justice; screening; psychiatric disorder; Voice DISC; DPS

In systematic studies across a range of juvenile justice settings, the prevalence of psychiatric disorder has been found to be higher than rates estimated from community samples. For example, while approximately 20% of youths in community samples meet criterion for disorder (U.S. Public Health Service, 2000), at least two thirds of detainees are similarly afflicted (Teplin, Abram, McClelland, & Dulcan, 2002), with similar elevations for youths in correctional settings (Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002). Given the large number of youths to be assessed, the limited staff resources, and the unavailability of service history records, justice settings often seek to streamline assessment procedures.

In the interest of efficiency, agencies often rely on screening procedures to identify youths who may need more extensive evaluation; they also use nonclinically trained staff to undertake portions of the assessment and use self-report instruments that require less clinical staff time (e.g., Grisso, Barnum, Fletcher, Cauffman, & Peuschold, 2001; Wasserman et al., 2004).

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A recent series of practice guidelines calls for mental health screening for youth upon intake to a juvenile justice facility (e.g., American Association for Correctional Psychology, 2000; American Psychiatric Association, 2002; Wasserman, Jensen, Ko, Trupin, & Cocozza, 2003). To alleviate biases that may influence more subjective referrals, screening instruments should be reliable and well-validated (Niarhos & Routh, 1992; Wasserman et al., 2003).

A recent review of instruments and procedure for mental health screening and assessment in juvenile justice youths (Grisso, Vincent, & Seagrave, 2005) outlines the benefits to justice agencies of implementing such procedures, including fulfilling regulatory requirements, improving staff decision making, and planning for resource management. Importantly, direction is provided for juvenile justice clinicians and administrators to aid in the selection of scientifically sound and well-validated instruments.

Grisso et al. (2005) described sound instruments in use, or appropriate for use, in juvenile justice settings, for screening for mental health problems. The limited number of such instruments is of concern. Of the eight instruments reviewed, five are "domain-specific," applicable to the assessment of substance abuse (Miller & Lazowski, 2001), trauma symptoms (Briere, 1996), and attention-deficit hyperactivity disorder (Conners, 1997; DuPaul et al., 1998; McCarney, 1995). Three other screening tools cover some wider range of psychopathology, but none maps readily onto specific disorders; one considers mental health concerns as a global scale (Rahdert, 1991) and another provides via direct interviewing of youth and caregiver, scales for substance use, self-harmful behavior, moods and emotions, and rational thinking (Hodges, 2000).

The third instrument reviewed (the Massachusetts Youth Screening Instrument: MAYSI-2; Grisso & Barnum, 2000) is widely used to screen for emotional or behavioral problems in justice-involved youths. In an earlier article (Wasserman et al., 2004), we examined the degree to which the MAYSI-2 could be used as a screen for diagnostic status. The MAYSI-2 was not developed to map directly onto diagnosis. Expectably, limited concordance was found between the MAYSI-2 and the computer-assisted self-interview with audio version of the Diagnostic Interview Schedule for Children–IV (Voice DISC [V-DISC]), a comprehensive diagnostic assessment.

In contrast, the DISC Predictive Scales (DPS; Lucas et al., 2001) were specifically developed as a diagnostic screen for disordered youths. Eleven of the 12 original DPS disorder subscales have been validated against the DISC (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) in a community sample and in a mixed sample of "troubled" 10- to 18-year-old youths of both genders (foster care, psychiatric inpatient, and court-referred status offenders DISC; Lucas et al., 2001). A more recent report (Lucas, 2006) described disorder subscales and cutoff scores for 16 DPS disorders in a community sample of 9- to 17-year-olds. To date, the DPS has not been validated against disorder for youths in a juvenile justice population. The high rates of disorder and comorbidity consistently found in juvenile justice populations would caution against using cutoffs established from community samples. If validated, this would be an important addition to the available instruments for mental health screening of justice youths.

To establish the DPS's ability to accurately identify diagnostic status in a sample of justice-involved youths, we examined its agreement with the V-DISC in a sample of 195 youths (87 females) undergoing evaluation in 2001 at a South Carolina assessment center prior to placement in a secure juvenile facility.

TABLE 1: Demographic Characteristics (*N* = 195)

Characteristic	M	SD
Age (in years)	15.7	1.1
Current school grade	8.6	1.2
Number of prior convictions	3.4	2.5
Days in custody	26.2	22.0
	n	%
Gender		
Male	108	55.4
Female	87	44.6
Ethnicity		
African American	109	55.9
White	79	40.5
Hispanic	4	2.1
Other	3	1.5
Violent Current Offense	26	13.3

METHOD

The Director of the South Carolina Department of Juvenile Justice provided access to youths at the Northeast Reception Center. Participating youths provided assent in a protocol approved by the New York State Psychiatric Institute/Columbia University Institutional Review Board.

PARTICIPANTS

Youth were selected randomly, depending on availability. More than 90% of the sample participated within 2 months of intake. Three hundred youths were invited to participate; all but 7 agreed. Sixteen youths were excluded for technical or logistical reasons (e.g., power outage, schedule conflicts); 9 parents withdrew their child's data. DISC data were available, then, for 268 youths, of whom 195 had also completed the DPS.

As considerably fewer females appear in juvenile justice populations, females were oversampled in order to obtain approximately equal numbers of each gender. Comparing youths with and without DPS data on seven demographic, offense, and DISC-derived mental health characteristics, the single significant difference was that those without DPS data had completed 3.5 more months of school, $t(292) = 2.09$, $p < .05$.

Table 1 presents sample characteristics. The average youth was 16 years old, in eighth grade, approximately 2 years behind expected grade level, and had three prior convictions. Thirteen percent had committed violent offenses. Reflecting state demographics, most youths were African American or White. There were no gender differences in demographic or offense characteristics.

PROCEDURE

Justice staff read a script to explain the purpose of the study, solicited participation, and obtained signed youth assent; then the youth self-administered the assessments, while justice staff were available, but not present, if youths had any questions or complications during

administration. Both the DPS and the V-DISC are computer-based instruments and present prerecorded questions via headphones, while written versions of the same questions appear on the computer screen. Completing the instruments at their own pace (on average, approximately 1 hr for the V-DISC and 15 min for the DPS), youths used the keyboard or mouse to enter responses. DPS and V-DISC were administered in the same order for all youth.

MEASURES

Demographic and justice information. Information was abstracted from official justice records regarding gender, age, ethnicity, academic grade, days in custody, number of prior convictions, and nature of current offense(s). Current offenses were dichotomized as violent (person or weapon related) or nonviolent.

V-DISC. The DISC-IV is a highly structured psychiatric interview designed to be administered by trained lay interviewers or self-administered to assess common *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994) child/adolescent mental disorders. It is the most extensively tested child and adolescent diagnostic interview (Shaffer et al., 1996). Developed for epidemiologic purposes and validated on diagnosis (Shaffer et al., 2000) and on future suicide attempts (Shaffer, Restifo, Garfinkel, Enhrensaft, & Munfah, 1998), the V-DISC's self-administered, computerized format renders it particularly useful for clinical applications in low-resource justice settings (Wasserman et al., 2002). The DISC has been used in research investigating prevalence of psychiatric disorder among justice-involved youths (Garland et al., 2001; Randall, Henggeler, Pickrel, & Brondino, 1999; Teplin et al., 2002; Wasserman et al., 2002; Wasserman, McReynolds, Ko, Katz, & Carpenter, 2005); in which validity has been demonstrated against externalizing disciplinary problems (Friman et al., 2000) and offense history (Wasserman et al., 2002). Preliminary data show no significant differences in the 1-month reliability of diagnoses between self- and interviewer-administered versions; most kappas range between .5 and .7 (Lucas, 2003). Test-retest reliability is as good as, or better than, previous versions (Shaffer et al., 2000).

The V-DISC assessed disorders present in the past month; consistent with *DSM-IV* logic, some diagnoses were based on symptoms that may have been present across a longer timeframe. Although the V-DISC includes a detailed assessment of impairment attributed to symptoms in six domains (problems with relationships or activities at home, school, or with peers), we considered diagnoses based on *DSM-IV* criteria alone because youth in the justice system, with expectably limited insight, judgment, and remorse do not accurately report their own impairment (Wasserman et al., 2002). Data were scored with Version E algorithms and analyzed with SPSS 13.0 (SPSS, 2004). The V-DISC (and the DPS) requires a third-grade oral English comprehension level.

DISC Predictive Scales. The DPS is made up of a brief diagnosis-specific self-report inventory to identify youths endorsing symptoms and who are highly likely to meet diagnostic criteria. Unlike the V-DISC, the DPS uses a past-year time frame. Furthermore, unlike the V-DISC, the version of the DPS available at the time of data collection provided a single score for its Alcohol/Substance Use subscale that aggregated across abuse and dependence for alcohol, marijuana, and other substances.

The DPS measures impairment with seven questions that inquire about parent and teacher reactions to, and limitations resulting from, youths' feelings and behavior. Youths are asked to indicate the frequency of these impairing feelings and behaviors ("*not at all,*" "*hardly*

ever," "*some of the time,*" or "*a lot of the time*"). For each question that is endorsed, they are asked to indicate whether the impairment was related to their anxious, depressed, irritable, or substance use behavior. The degree to which these impairment items might refine the DPS's ability to identify disordered youths has not been examined in a juvenile justice sample.

As noted previously, two sets of cut points are available for the DPS, one based on the original standardization (Lucas et al., 2001) and another based upon a more recent community sample (Lucas, 2006). We used the cutoffs for the nine disorder subscales from the original standardization (Agoraphobia, Obsessive-Compulsive [OCD], Social Phobia, Specific Phobia, Major Depression, Attention Deficient Hyperactivity, Conduct, Oppositional Defiant, and Alcohol/Substance Use) because they were validated in youths who more closely resembled the present sample in age and in antisocial history than did the later community sample. For two additional disorders (panic and generalized anxiety) that were not examined in the original sample (Lucas et al., 2001), the more recent DPS disorder subscale cutoffs (Lucas, 2006) were used.

STATISTICAL METHODS

Data reduction. We examined the ability of the DPS to identify type of disorder rather than a specific disorder (e.g., anxiety disorder instead of agoraphobia). From a public health perspective, efficient screening should identify those youths with some disorder, and thereby give direction to the ensuing clinical evaluation by highlighting the type of psychopathology that the youth reports. In this sense, efficient screening should indicate the presence of one or another disorder in a cluster of similar disorders. Prior investigations of DPS psychometrics (Lucas, 2006) have considered only individual disorders rather than diagnostic clusters.

Analyses were confined to those disorders that were measured on both the DISC and the DPS. We examined 16 DISC disorders in four diagnostic clusters (Wasserman et al., 2002): disruptive behavior disorders (DBD), substance use disorders (SUD), anxiety disorders, and affective disorders. The V-DISC's six SUDs were collapsed into a single cluster for ease of comparability with the DPS's single Alcohol/Substance Use subscale. Additionally, responses to individual items in the V-DISC's Major Depression module provide information on recent (past month) suicidal ideation and attempt, and on lifetime attempt.

The 11 DPS disorder subscales were grouped into the four diagnostic clusters considered above for the V-DISC. Youths scoring above any one of the DPS disorder subscale cutpoints in a given diagnostic cluster were considered to be "screen positive" for that cluster. In corresponding fashion, youths meeting criteria for any one of the disorders in a V-DISC cluster were considered positive for that cluster. The 11 DPS disorder subscales were compared to the corresponding 11 V-DISC diagnoses (with the six DISC SUDs collapsed into a single cluster). We also compared two DPS items that queried youths on past-year suicide ideation and attempt to responses on the V-DISC.

Statistical analysis. We first examined the percentages of youths identified by DPS disorder subscales and clusters, and by V-DISC disorders and clusters. Next, we calculated sensitivities, specificities, and positive and negative predictive values for DPS clusters in relation to DISC diagnostic clusters. Cutoffs for the DPS disorder subscales have not been examined in juvenile justice samples; therefore, continuous summary subscales that summed DPS items across the component disorders for each cluster were then created. The reliability of these continuous summary subscales was assessed with intraclass correlation coefficients (Cronbach's alpha). In another set of analyses, they were related to DISC clusters.

Following the logic of Angold and colleagues for considering comorbidity (Angold, Costello, & Erkanli, 1999; Wasserman et al., 2004), we defined relations between the three types of DPS measures (clusters, disorder subscales, and continuous summary subscales) and the two types of V-DISC measures (disorders and clusters) that share the same underlying constructs as *homotypic* mappings. *Heterotypic* mappings included all remaining associations. Dichotomous analyses, relating DPS and V-DISC disorders and clusters, use chi-square analysis. Analyses then used logistic regression to predict DISC diagnostic clusters from their DPS counterparts. Because responses likely vary by length of confinement and demographic differences (University of Massachusetts Medical School, 2005), regression analyses were adjusted for gender, ethnicity, age, and days in custody.

Receiver operating characteristic (ROC; Nunnally & Bernstein, 1994) analyses facilitated comparisons across diagnostic clusters. ROC curves depict the relation between the true-positive rate (sensitivity) and the false-positive rate (one specificity). For example, to generate an ROC curve for SUD, one would first calculate the fraction of DISC identified cases detected on the DPS, and divide that amount by the fraction of non-DISC-disordered individuals identified by the screen. The area under the ROC curve (AUC) provides an estimate of the diagnostic accuracy of the DPS. Higher AUCs reflect a greater probability that a youth with a disorder on the V-DISC will score above the cut point on the designated DPS continuous summary subscale. AUC values greater than .5 reflect above chance-level accuracy; an AUC of 1.00 indicates perfect accuracy.

RESULTS

IDENTIFICATION OF DISORDER

Identified on DPS. Table 2 presents the percentages of youths scoring above DPS disorder subscale cut points, those identified by DPS clusters, and those meeting criteria for V-DISC disorders and clusters. Examining DPS clusters, almost two thirds of the sample endorsed one or another anxiety disorder, almost half reported an affective disorder, more than half endorsed a DBD, with more than half self-reporting an SUD. Sixteen percent of the sample reported past-year suicide ideation, and 13.6% reported a past-year attempt. Further restricting DPS screen positives to those who also endorsed impairment "*some*" or "*a lot*" of the time, expectably decreased rates of DPS-identified disorder (for anxiety, affective, DBD, and SUD, respectively to 23.1%, 12.3%, 43.6%, and 21.0%).

The DPS continuous summary subscales demonstrated adequate reliabilities: αs = .86, .77, .84, .88, respectively, for the Anxiety, Affective, DBD, and SUD subscales. Scores on the 30-item Anxiety subscale ranged from 0 to 21, with a mean of 5.9 (*SD* = 5.5). Scores on the 7-item Affective subscale ranged from 0 to 7, with a mean of 2.5 (*SD* = 2.1). Scores on the 21-item DBD subscale ranged from 0 to 20, with a mean of 7.2 (*SD* = 5.0). Scores on the 15-item SUD subscale ranged from 0 to 15, with a mean of 3.2 (*SD* = 3.4).

Identified on V-DISC. Rates of DISC disorder (individual diagnoses and clusters) are similar to earlier reported rates in a sample of incarcerated males (Wasserman et al., 2002). An exception is that the presence of younger juveniles and females here expectably increases rates of affective and anxiety disorders relative to the earlier sample (Wasserman et al., 2005). Fifteen percent of the sample reported thinking seriously about killing themselves in the past month; 3.6% reported a past-month attempt, and 18.5% reported a lifetime attempt.

TABLE 2: DPS and V-DISC Identified Rates of Disorder (*N* = 195)

Disorder	*DPS Disorder Subscale Cut Points*	*Youths Identified by DPS Disorder and Cluster Subscales % (n)*	*Youths Meeting Criteria for V-DISC Disorders and Clusters % (n)*
Any disorder		87.2 (170)	61.0 (119)[a]
Anxiety cluster		65.1 (127)	22.6 (44)
Agoraphobia	> 0	42.4 (64)	7.2 (14)
Social Phobia	> 1	23.6 (46)	4.7 (9)
Obsessive Compulsive	> 1	48.1 (74)	5.7 (11)
Specific Phobia	> 2	25.6 (40)	8.9 (17)
Generalized Anxiety	> 2	6.1 (10)	1.5 (3)
Panic	= 2	15.7 (20)	4.6 (9)
Affective cluster (Major Depression)	> 4	19.5 (34)	12.0 (23)
Disruptive Behavior cluster		51.3 (100)	32.8 (64)
Attention Deficit Hyperactivity	> 4	12.2 (21)	2.7 (5)
Oppositional Defiant	> 3	32.2 (56)	6.3 (12)
Conduct	> 2	46.0 (80)	31.6 (60)
Substance use cluster	> 0	51.8 (101)	40.0 (78)
Alcohol Abuse/Dependence[b]		29.5 (44)	13.2 (25) / 10.3 (20)
Marijuana Abuse/Dependence		33.8 (52)	15.3 (29) / 23.3 (44)
Other Substance Abuse/Dependence		22.6 (44)	6.5 (12) / 3.8 (7)
Suicide Risk			
Past month ideation			15.4 (30)
Past year ideation		16.4 (32)	
Past month attempt			3.6 (7)
Past year attempt		13.6 (24)	
Lifetime attempt			18.5 (36)

Note. DPS = DISC Predictive Scale; V-DISC = Voice Diagnostic Interview Schedule for Children.
a. Based on the 16 V-DISC disorders considered here.
b. Abuse and dependence are considered together on the DPS, whereas the DISC differentiates the two levels of substance-related disorder.

As in other samples of justice-involved youths (Abram, Teplin, & McClelland, 2003; Teplin et al., 2002; Wasserman et al., 2002), comorbidity was high: Almost 40% reported more than one disorder, and more than a third endorsed disorder in more than one diagnostic cluster. Approximately 6% met criteria for both an anxiety and affective disorder; a quarter met criteria for both a DBD and SUD. Other combinations of comorbid disorders were less common.

Differences in DPS and V-DISC disorder rates. For both clusters and individual disorders, more youths reported disorder on the DPS than on the V-DISC, ranging from a 1.5-fold increase in conduct disorder to an almost eightfold increase in OCD. The higher "yield" on the DPS is expectable given the more discriminating logic embedded in the V-DISC programming (e.g., predefined required levels of symptom duration and frequency), and given that the DPS cut points used here were not derived from an incarcerated sample.

RELATING DPS AND V-DISC

DPS and V-DISC clusters. On the basis of the unadjusted analyses, of the 119 youths endorsing one or another of the 11 measured DISC disorders, 98.3% screened positive for at least one disorder on the DPS, $\chi^2(1, N = 117) = 33.9$, $p < .0001$. Of 44 youths endorsing a V-DISC anxiety disorder, 97.7% screened positive on the DPS Anxiety cluster, $\chi^2(1, N = 43) = 26.6$, $p < .0001$. Of 23 youths endorsing a DISC affective disorder, 78.3% screened positive on the DPS Affective cluster, $\chi^2(1, N = 18) = 13.16$, $p < .0001$. Of 64 youths endorsing a

TABLE 3: Receiver Operating Characteristic (ROC) Estimates and Logistic Regression Odds Ratios (OR) for DPS Clusters

		DISC Diagnostic Clusters				
DPS Clusters		*Any DISC Disorder*	*Anxiety*	*Affective*	*Disruptive*	*Substance Use*
Any DPS cluster	AUC (se)	.65 (.04)	.58 (.05)	.57 (.06)	.60 (.04)	.59 (.04)
	Sens / Spec	.98 / .30	1.00 / .17	1.00 / .15	1.00 / .19	.97 / .20
	PPV / NPV	.69 / .92	.26 / 1.00	.14 / 1.00	.38 / 1.00	.45 / .92
	Adjusted OR	28.45***	6E+008 *ns*	3E + 008 *ns*	1.1E + 09 *ns*	9.62**
Any Anxiety	AUC	.60 (.04)	**.71 (.04)**	.63 (.06)	.54 (.04)	.49 (.04)
	Sens / Spec	.73 / .47	**.98 / .44**	.87 / .38	.70 / .37	.64 / .34
	PPV / NPV	.69 / .53	**.34 / .99**	.16 / .96	.35 / .72	.39 / .59
	Adjusted OR	2.83**	**35.22 *****	4.45*	1.60 *ns*	1.00 *ns*
Any Affective	AUC	.63 (.04)	.65 (.05)	**.70 (.07)**	.60 (.04)	.57 (.04)
	Sens / Spec	.27 / .94	.43 / .88	**.55 / .85**	.30 / .86	.21 / .82
	PPV / NPV	.88 / .41	.53 / .83	**.35 / .93**	.53 / .69	.47 / .58
	Adjusted OR	5.92**	5.42***	**8.12*****	3.13**	1.31 *ns*
Any Disruptive	AUC	.71 (.04)	.58 (.05)	.60 (.06)	**.78 (.03)**	.66 (.04)
	Sens / Spec	.67 / .74	.64 / .52	.70 / .51	**.89 / .67**	.71 / .62
	PPV / NPV	.80 / .59	.28 / .83	.16 / .92	**.57 / .93**	.55 / .76
	Adjusted OR	5.35**	1.96 *ns*	2.29 *ns*	**17.42 *****	3.50***
Any Substance Use	AUC	.70 (.04)	.50 (.05)	.47 (.06)	.68 (.04)	**.82 (.03)**
	Sens / Spec	.67 / .72	.52 / .48	.48 / .47	.77 / .60	**.90 / .74**
	PPV / NPV	.79 / .59	.23 / .78	.11 / .87	.49 / .84	**.69 / .91**
	Adjusted OR	5.10***	1.04 *ns*	0.78 *ns*	4.67***	**24.63*****

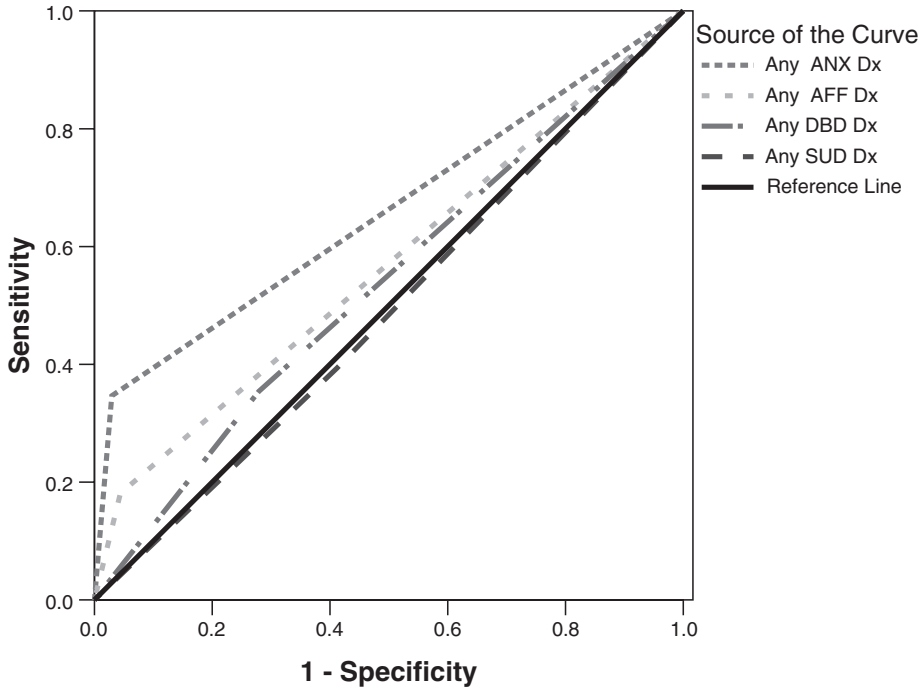
Note. Boldface numbers represent homotypic mappings; others represent heterotypic mappings. V-DISC Predicting diagnostic clusters (adjusted for gender, ethnicity, age, days in custody). DPS = DISC Predictive Scale; V-DISC = Voice Diagnostic Interview Schedule for Children; AUC(se) = area under the curve estimate; Sens = sensitivity estimate; Spec = specificity estimates; PPV = positive predictive; NPV = negative predictive.
*$p < .05$. **$p < .01$. ***$p < .001$. *ns* = not statistically significant.

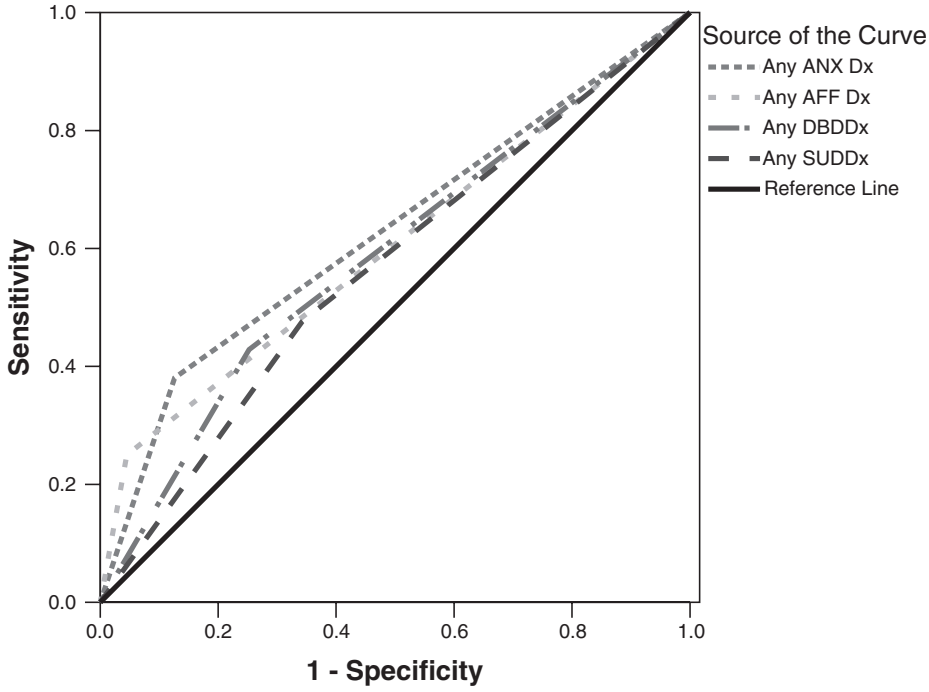
V-DISC DBD, 89.1% screened positive on the DPS DBD cluster, $\chi^2(1, N = 57) = 54.4$, $p < .0001$. Of 78 youths endorsing a V-DISC SUD, 89.7% screened positive on the DPS Substance Use cluster, $\chi^2(1, N = 70) = 75.0$, $p < .0001$.

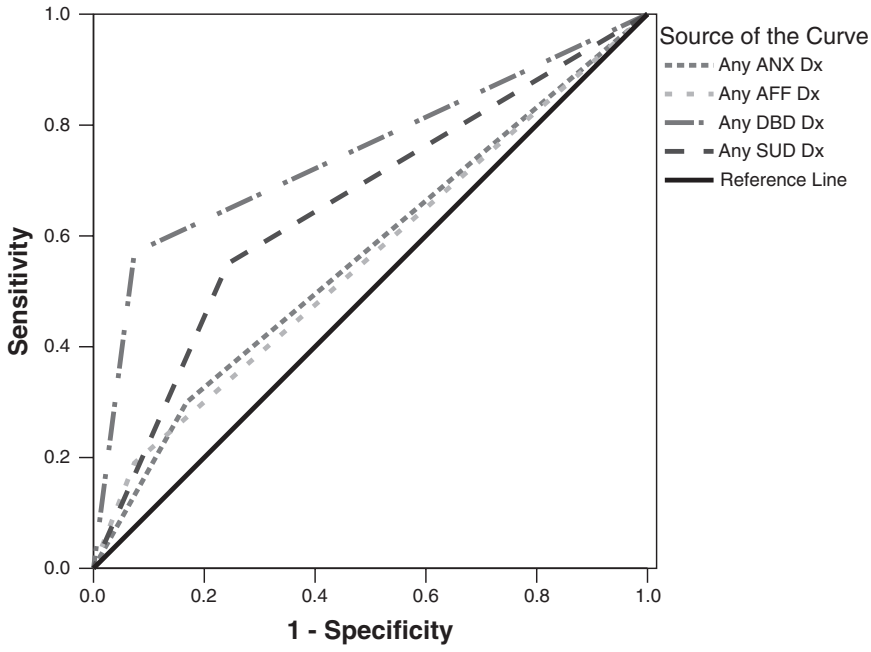
Table 3 presents adjusted logistic regression odds ratios (ORs) comparing DPS and V-DISC clusters. ORs for homotypic clusters were consistently significant and substantially larger than those for heterotypic clusters, suggesting that the DPS clusters map more specifically onto their V-DISC counterparts than onto other types of disorder.

DPS continuous summary subscales and V-DISC clusters. Sensitivities and specificities for both homotypic and heterotypic comparisons (Table 3) ranged between .55 and .98 and .21 and .87, respectively. Among homotypic comparisons, the smallest positive predictive value (.34) was observed for anxiety disorder; the largest positive predictive value (.69) was observed for SUD. Negative predictive values for homotypic comparisons were uniformly high, ranging from .91 for SUD to .99 for anxiety.

Table 3 also presents AUC estimates for DPS continuous summary subscales and V-DISC clusters. The highest AUCs were noted for SUD and DBD comparisons (AUCs = .82 and .78, respectively). Figure 1 illustrates the relationship between each DPS continuous







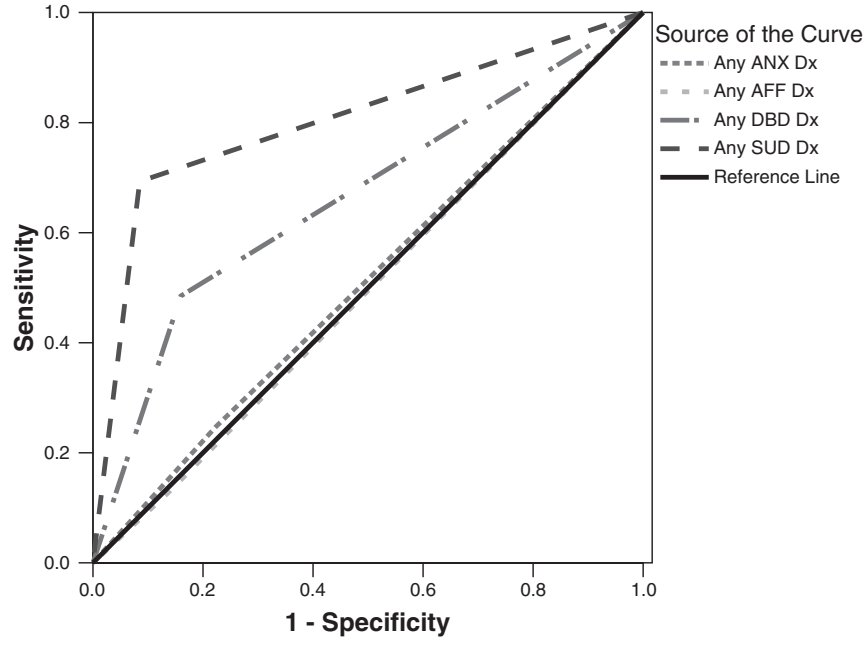


Figure 1: Receiver Operating Characteristic Curves for DPS Cluster Subscales
Note. (a) DPS Anxiety cluster subscale versus V-DISC clusters. (b) DPS Affective cluster subscale versus V-DISC clusters. (c) DPS Disruptive Behavior cluster subscale versus V-DISC clusters. (d) DPS Substance Use cluster subscale versus V-DISC clusters. DPS = DISC Predictive Scales; DISC = Diagnostic Interview Schedule for Children. ANX = anxiety; AFF = affective; DBD = disruptive behavior disorders; SUD = substance use disorders.

TABLE 4: Scale Characteristics for DPS Continuous Summary Subscales

DPS Continuous Summary Subscales	*Number of Items*	*Established Cut Point*	*Sensitivity*	*Specificity*	*PPV*	*NPV*
Anxiety	30	≥ 3	.91	.49	.39	.94
Affective	7	≥ 3	.82	.44	.22	.96
Disruptive	21	≥ 5	.92	.48	.56	.91
Substance Use	15	≥ 1	.95	.44	.69	.91

Note. Sensitivities, specificity, and positive and negative predictive values were calculated by comparing DPS continuous summary subscales with homotypic V-DISC clusters. Sensitivity is the probability that a DISC disordered individual screens positive on the DPS. Specificity is the probability that an individual who is nondisordered on the V-DISC, screens negative on the DPS. PPV = positive predictive value (i.e., PPV is the probability a person who screens positive on the DPS also reports a disorder on the V-DISC); NPV = negative predictive values (i.e., NPV is the probability a person who screens negative on the DPS is nondisordered on the V-DISC); DPS = DISC Predictive Scale; V-DISC = Voice Diagnostic Interview Schedule for Children.

summary subscale and the four V-DISC clusters, where plot diagonals represent chance level mapping. Ideally, curves for homotypic mappings should be noticeably further above the diagonal than those for heterotypic mappings. As expected, each DPS continuous summary subscale maps better onto its corresponding V-DISC cluster than onto heterotypic clusters. Furthermore, each DPS continuous summary subscale maps better onto expectably comorbid DISC clusters (Angold et al., 1999; affective and anxiety disorders, SUD, and DBD) than onto less commonly comorbid pairings.

Relating DPS impairment-adjusted and DISC clusters. To facilitate DPS/V-DISC comparisons, we calculated the AUCs, sensitivities, specificities, positive predictive values, negative predictive values, and adjusted ORs, relating impairment-adjusted DPS clusters to V-DISC clusters. Results for Affective, DBD, and SUD clusters were essentially unchanged relative to nonimpairment-adjusted comparisons (data not shown). Impairment-adjusted DPS scores for the Anxiety cluster revealed substantially lower sensitivity and correspondingly higher specificity when compared to nonimpairment adjusted scores. On the other hand, the AUC, positive predictive value, and negative predictive value remained the same regardless of impairment.

Relating DPS continuous summary subscales and V-DISC clusters. Because cut points for DPS continuous summary subscales have not previously been defined, we next inspected their cumulative frequencies. Table 4 presents the number of items in each DPS continuous summary subscale, the cutpoint derived earlier, sensitivity, specificity, and positive and negative predictive values. Sensitivities ranged from .82 for affective disorder to .95 for SUD; specificities ranged from .44 for affective disorder and SUD to .49 for anxiety disorder. PPVs ranged from .22 for affective disorder to .69 for SUD; negative predictive value ranged from .91 for DBD and SUD to .96 for affective disorder.

DPS and V-DISC suicidality. Of 30 youths reporting past-month suicide ideation on the DISC, 43.3% reported past-year suicide ideation on the DPS, $\chi^2(1, N = 13) = 18.7, p < .0001$. This mapping resulted in an AUC of .66. Of 7 youths reporting a past-month attempt on the V-DISC, 85.7% reported a past-year attempt on the DPS, $\chi^2(1, N = 6) = 32.2, p < .0001$, which resulted in an AUC of .88. Of 35 youths reporting a lifetime suicide attempt on the V-DISC, 51.4% reported a past-year suicide attempt on the DPS, $\chi^2(1, N = 18 = 53.0, p < .0001$,

which resulted in an AUC of .74. Youths who reported past-year suicide ideation on the DPS were significantly more likely to report past-month and lifetime suicide attempt on the V-DISC (ORs = 28.3 and 19.9, *ps* < .01). Similarly, youths who reported a past-year suicide attempt on the DPS were significantly more likely to report a past-month and lifetime suicide attempt on the V-DISC (ORs = 52.9 and 24.2, *p*s < .001).

DISCUSSION

Regarding the accuracy of the DPS as a first-stage screen for V-DISC disorder, results herein suggest that earlier findings, observed in community samples of youths, can be generalized to juvenile justice settings. At the cluster level, there was considerable concordance across instruments, with agreement higher for homotypic comparisons, even upon adjustment for demographic and offense characteristics, and despite the two instruments' differing time frames. Expectable for a first-stage screen, the DPS consistently identified higher percentages of youths than did the V-DISC. Rates of DPS- and V-DISC-identified disorder in the present investigation were most similar for DBD and SUD. There was substantial agreement across instruments in reported suicide attempts, again despite differing timeframes. For each DPS cluster, we were able to define cutpoints for continuous summary subscales that identified 80% or more of DISC disordered youths.

The DPS demonstrated high concordance with V-DISC results from investigations in community samples of youth, although the AUCs relating DPS and V-DISC clusters in the present investigation revealed somewhat lower concordance than reported agreement for *individual* disorders than in community samples (Lucas et al., 2001). Lower concordance is not a reflection of poor DPS/V-DISC agreement; ORs in the present sample, even for internalizing disorders, remain high.

EXAMINING SOURCES OF NONCONCORDANCE

We have identified two areas of potential nonagreement: DPS measures in the internalizing domain were less accurate than those in the externalizing domain. We found slightly lower AUC estimates for both internalizing clusters than for the externalizing clusters, as well as lower specificity and PPV, relative to other clusters. The three DPS measures of Anxiety subscales tended to overidentify youths relative to the V-DISC. The DPS Affective continuous summary subscale (which consisted only of the major depressive disorder items) was less accurate in identifying disordered youths than were other continuous summary subscales.

Regarding the first of these, the Anxiety cluster was overidentified by a factor of almost three, while other clusters were overidentified by factors ranging only between 1.3 and 1.6. When we examined rates of individual disorders within the Anxiety cluster, the greatest overidentification was for OCD, for which the community-derived DPS cut point of one or more resulted in more than an eightfold overidentification relative to V-DISC. The similarly elevated false-positive rate for the Anxiety continuous summary subscale may reflect a contextual response to the justice intake process rather than true disorder. For example, among those above the DPS OCD cut point of one or more, more than 82% reported ruminating symptoms, not surprising given that youths were newly admitted to an assessment center, awaiting placement for serious misbehavior. To meet criteria for OCD on the V-DISC, obsessions or compulsions must be felt to be intrusive or distressing; because the DPS makes this distinction to

a far lesser degree, ruminating youths may be identified as showing OCD on the DPS, while they will be excluded by the V-DISC's logic. In an attempt to approve agreement on DPS Anxiety measures, we examined how requiring impairment for those subscales impacted concordance. Requiring impairment had little impact on DPS/V-DISC concordance for affective disorder, DBD, and SUD. For anxiety disorder, considering DPS impairment increased specificity at the cost of reduced sensitivity. This suggests that community-derived norms, especially for Anxiety Disorders, may not apply readily to juvenile justice samples, and future work should address issues of appropriate norming.

Regarding the second source of nonconcordance, we found lower sensitivity and PPV for the Affective cluster compared to other clusters. As found for the Anxiety cluster, we also noted lower AUCs relative to those for externalizing clusters. While other cut points on the derived continuous summary subscales correctly identified more than 90% of disordered youths, the cut point for the Affective continuous subscale only identified 82% of the disordered. To some extent, this disagreement results from both the Affective subscale's limited number of items and its being based on a single affective disorder (major depressive disorder). At the time of data collection, the DPS did not measure symptoms of other affective disorders, although the most updated version (Lucas, 2006) inquires about symptoms of mania. To some degree, nonconcordance for both internalizing subscales may also be a consequence of the lower base rates of disorder in the internalizing domain, relative to the externalizing domain, in the present sample.

Although the DPS internalizing subscales did not identify disordered youths as well as the externalizing subscales, it is important to note that agreement on suicide risk items, although a component of the Affective Disorder subscale, was strong, despite differing timeframes. Since juvenile justice administrators are particularly concerned with the identification of potentially suicidal youth, the results herein suggest that the DPS may be useful for this purpose.

LIMITATIONS

We validated the DPS against the V-DISC, rather than against a clinical evaluation, and relied upon a single informant, the youth, whereas a clinic would typically use information from several sources, including multiple informants. Concordance between structured interviews and clinician diagnosis is generally moderate to poor (e.g., Ezpeleta et al., 1997). Clinician diagnoses are subject to a range of biases (e.g., Lewczyk, Garland, Hurlburt, Gearity, & Hough, 2003), while structured interviews have been found to improve reliability and eliminate such biases by standardizing information gathering and decision making. While the V-DISC is widely used as a component of mental health assessment in juvenile justice settings (Grisso et al., 2005), the present findings of DPS/V-DISC concordance should be expanded by comparisons between DPS and clinical interviews.

Although the present report finds a high degree of concordance across instruments, we were unable to examine the characteristics of youths that contribute to nonagreement. While agreement might differ in certain subgroups of youths, the sample is not sufficiently large to examine agreement separately by such features as gender, age, ethnicity, or by criminal history. We did, however, adjust for these features in the regression analyses. At the time this study was conducted, the DPS inquired about a limited range of disorders. The newest version (Lucas, 2006) includes measures of posttraumatic stress disorder, generalized anxiety disorder, and mania, a computer-generated report that includes youth's level of impairment,

as well as additional items designed to reduce false positive screens for OCD and agoraphobia. Finally, while 90% of the sample participated within 2 months of intake, small sample size precluded examination of the impact of "days since intake." Although it is likely that certain disorders, particularly anxiety disorder, may decrease over the weeks following intake as youth familiarize themselves with their new setting, this should result in lower rates of disorder on both DPS and DISC administered at the same session.

CLINICAL IMPLICATIONS

In many juvenile justice settings, particularly in those where youths are securely held after adjudication, policy recommends that the mental health status of all youths must be ascertained (Council of Juvenile Correctional Administrators, 2006; Wasserman et al., 2003). As juvenile justice authorities struggle to meet this goal in the face of often-restricted mental health resources, they seek procedures to identify efficiently youths who need formal evaluation.

A number of screening models exist (Shrout, Skodol, & Dohrenwend, 1986) including a two-stage process (e.g., using a screen such as the DPS to identify which youths should have a more thorough clinical evaluation) or a three-stage model (e.g., using a screen such as the DPS, followed by a more in-depth interview such as the V-DISC to identify which youths should have a face-to-face interview with a clinician.) It should be noted that the present validation considered neither of these models; instead the V-DISC was considered an analog of a clinical evaluation in a two-stage model. As reviewed previously, there are substantial limitations to considering the V-DISC as a gold standard for clinical evaluation.

Safety in screening is necessary, as agencies must assure, for example, that suicidal youth are identified. Efficiency is also vital, as agencies bear the costs associated with a formal evaluation of those incorrectly identified in screening. Despite these concerns, there are few evaluations to determine which assessment procedures work well in juvenile justice settings. Steering a course between the opposing "Scylla and Charbidis" dangers of unsafe and inefficient procedures, juvenile justice agencies require a structured, well-integrated approach toward mental health screening and assessment. This approach would necessitate that instruments, procedures, and algorithms that define which youths are sent on for evaluation are all well described, and that their ongoing usefulness is periodically reviewed.

Given that a screen-identified individual will be sent on to a mental health evaluator, the DPS, with its moderate level of diagnostic specificity, would be most practical. Merely indicating that a youth meets criteria for some disorder offers insufficient focus for the ensuing evaluation. Conversely, given the high levels of comorbidity in juvenile justice samples, screening for a particular disorder, rather than a diagnostic cluster, is unnecessarily redundant, since specific diagnoses would still need to be confirmed prior to treatment. The results offered here suggest that agencies wanting a brief screening instrument that provides some specificity in youths' diagnostic profile would be well-served by using the DPS.

Among the well-validated screens reviewed by Grisso et al. (2005), those that are "domain-specific" may be limited in their usefulness, because they provide information about a single area of psychopathology. Given the consistent reports of substantial comorbidity in juvenile justice samples, it is inefficient to screen for disorders with instruments that consider disorders one at a time. Of the multidimensional screening tools commonly employed in juvenile justice settings (Grisso et al., 2005), none maps readily onto specific disorders. In this regard, the DPS

offers advantages over existing screens for disorder in terms of accuracy and specificity. On the other hand, determining whether universal health screening or universal mental health assessment is the more efficient practice is a more complicated issue. Depending upon youths' expected rates of disorder, the personnel costs associated with both screening and clinical assessment, the staff efforts associated with arranging two (rather than a single) interview, and the psychometrics of the screen itself, agencies may prefer one or another assessment protocol. Recommendations will differ as a function of these factors, and juvenile justice agencies should consider them carefully when planning assessment protocols.

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