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Abstract

The Delinquent Activities Scale (DAS) was used to develop indicators of conduct disorder (CD) in terms of symptom severity and age of onset. Incarcerated adolescents ($N = 190$) aged 14 to 19 were asked about their delinquent behaviors, including age the behavior was first performed, as well as substance use and parental and peer influences. Assessments were performed for the 12 months prior to incarceration and at 3-month postrelease follow-up. Evidence supports the utility of the DAS as a measure of CD diagnosis, including concurrent incremental validity. Furthermore, CD severity (symptom count) was significantly associated with two peer factors: friend substance use and friend prior arrests, with medium to large effect sizes (ESs). Earlier age of CD onset was associated with earlier marijuana use. This study finds that the DAS is a useful instrument in that it is easy to apply and has adequate psychometrics.

Keywords

conduct disorder; delinquency; adolescence; substance use; Delinquent Activities Scale

Conduct disorder (CD) is a pattern of antisocial behaviors that can include physical aggression, deception, and crimes. It is generally reported that incarcerated juveniles have higher rates of CD (86.2%; Stein, 2004) than clinic samples (30% to 50%; Kazdin, 1985); boys are more frequently diagnosed (1.8% to 16%) than girls (0.8% to 9.2%; P. Cohen, Cohen, & Brook, 1993; Furgusson, Horwood, & Lynskey, 1993; Kashani, Daniel, Sulzberger, Rosenberg, & Reid, 1987); and adolescents in the general population appear to

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have slightly higher rates of CD (7.1%; P. Cohen et al., 1993) as compared to younger children (5.4%; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998).

Several structured interviews exist in the literature to diagnose CD, including the Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Dulcan, & Davies, 1996), the Diagnostic Interview for Children and Adolescents (Herjanic & Reich, 1982), and the Schedule of Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime (Kaufman et al., 1997). These instruments are often lengthy and require an experienced clinician. Further, most measures of CD ask about age of symptom onset only for those symptoms present during the past 12 months, leading to misclassification of some youths with childhood onset as having adolescent onset CD (Lahey et al., 1998).

The Delinquent Activities Scale (DAS) was developed to provide an efficient measure of CD. The DAS is relatively brief, and specialized training is not needed to administer it. The age of onset issue noted in other measures is circumvented by asking about the age of first occurrence of each behavior. The DAS also examines important delinquent activities and whether they were committed with substances involved. It offers empirically validated scales (e.g., predatory aggression related to alcohol use, general drug dealing, and delinquency) relevant to assessing youth with behavior disorders (Reavy, Stein, Paiva, Quina, & Rossi, 2012).

Study Aims

The present study assesses the validity of the DAS in providing a CD diagnosis and extends the usefulness of the DAS by evaluating the relationship of CD diagnosis to factors known to be related to CD.

Factors Related to CD

A number of important factors (verbal intelligence, genetics, etc.) are noted in the literature to be related to CD. However, to evaluate the validity of the DAS, this study focuses on a subset of factors (peers, parents, and substance use) whose significance is well established.

Parents

Specific parenting practices such as poor monitoring, permissiveness, and lack of communication, warmth, and support have been associated with negative externalizing behaviors such as CD (Barnes, Farrell, & Dintcheff, 1997; Keenan, Loeber, & Green, 1999). Four elements may influence development of CD: neglect, conflict, deviant attitudes, and disruptions in parenting, with conflict and neglect being particularly relevant in development of aggression and covert conduct problems, respectively (Loeber & Stouthamer-Loeber, 1986). However, one particularly strong risk factor associated with CD is parental substance abuse (e.g., Bucholz et al., 2010; Frick et al., 1992; Kazdin, 1997).

Peers

Externalizing behavior problems such as CD often occur during a child's movement away from the sphere of parental influence. It is in the transition to a deviant peer environment

where substance use (Blackson et al., 1999) and development of CD often occur. Adolescent antisocial behavior may then happen when aggressive children gravitate toward one another (Boivin & Vitaro, 1995) as a consequence of deviance being reinforced within the peer group (Kiesner, Dishion, & Poulin, 2001) or because of rejection by nondeviant peers (Patterson, Kapaldi, & Bank, 1991). The influence of peer behaviors on an adolescent's delinquency seems to greatly outweigh the influence of both peer and adolescent attitudes toward delinquency. This suggests that an adolescent's delinquency may stem from imitation, seeing peers get reinforced for misbehavior, and from direct reinforcement by peers, which are mechanisms of social learning theory (Warr & Stafford, 1991).

Age of Onset

There is a relationship between age of onset of CD and number of aggressive behaviors, suggesting that a natural dichotomy exists between the childhood- and adolescent-onset subtypes, with obvious changes in aggression occurring at ages of onset around 10 years of age (Lahey et al., 1998). Early age of CD onset may be prognostic of chronic deviance, whereas later onset tends to be transitory and less serious (Keenan et al., 1999). The probability of a child with CD meeting diagnostic criteria for antisocial personality disorder (ASPD) in adulthood is twice as high if the antisocial behaviors began in childhood than if they began in adolescence (Lahey et al., 1998). However, it must be noted that these conclusions are based primarily on research with boys; much less is known about CD and girls.

Substance Use

There appears to be a strong association between CD and substance use. CD appears to be the most common comorbid psychiatric diagnosis in adolescent alcohol and drug abusers (Myers, Brown, & Mott, 1995). Youths with CD typically have earlier onset and higher rates of substance use. Marijuana users report a myriad of poorer outcomes involving school, health, and parents, and greater involvement in delinquency, as compared with nonusers (Dembo, Williams, Wothke, & Schmeidler, 1992). White, Xie, Thompson, Loeber, and Stouthamer-Loeber (2001) found that higher levels of CD behaviors predicted higher levels of alcohol use, and among CD youth, attention-deficit/hyperactivity disorder youth, and violent offenders, only CD youth showed a pattern of continued increase in alcohol use.

Aims and Hypotheses Regarding the DAS as a Measure for CD

CD symptom severity as derived from the DAS was hypothesized to be greater in adolescents with more negative parental influence, more negative peer influences, and earlier onset of substance use. Similar relationships were hypothesized for CD age of onset. In a rather stringent test of validity (Hunsley & Meyer, 2003), concurrent incremental validity was also examined, because measures intended for applied use should yield an improvement in prediction as compared to results derived from assessment data that are easily and routinely obtained (Sechrest, 1963). To establish concurrent incremental validity, CD symptom severity and, separately, CD age of onset, were hypothesized to be related to current substance use, beyond demographics and age of first substance use, using

hierarchical linear regressions. Finally, stability and internal consistencies are presented for the DAS-derived CD scale.

Method

Participants

Participants (*N* = 190) were incarcerated adolescents at a facility in the Northeast who were recruited for a treatment study described elsewhere (Stein et al., 2006). At 3-month follow-up, 180 participants were retained. The study included adjudicated adolescents who met any of the following criteria: (a) in the year prior to incarceration they used marijuana or alcohol at least monthly, or they binge drank (5 drinks for boys,   4 drinks for girls) at least once; (b) they used marijuana or drank in the 4 weeks preceding the offense for which they were incarcerated; or (c) they used marijuana or drank in the 4 weeks preceding incarceration. Mean (*M*) age for the sample was 17.1 years (standard deviation [*SD*] = 1.10), most were male (86%), and racial diversity was evident with 32.6% White, 29.4% Hispanic/Latino, 27.9% African American, 3.2% Asian American, 3.7% Native American, and 3.2% self-described as "other." The majority of participants (70.5%) were diagnosed with adolescent-onset CD, and less than 10% endorsed more than 10 CD symptoms.

Procedure

All procedures were approved by the Brown University Institutional Review Board, and by the correctional facility's research review committee. Participants were identified through daily contacts with all units that house adjudicated adolescents. Informed written consent was obtained from adolescents and guardians (minors provided assent) and assessments were conducted in private with trained interviewers. Baseline assessment was completed shortly after adjudication; 3-month follow-up assessment was conducted after release. Time between baseline and follow-up assessment was *M* = 253 days (*SD* = 92 days).

Measures

Parent Influences—Adolescents were asked if, due to substance use, either parent had a problem with (a) family/friends, (b) work, or (c) the law. They also were asked whether either parent had been incarcerated or had a history of substance abuse. Response format included Yes, No, and unable to determine. We considered combining these five questions into a single parent indicator (0 = *no occurrence* to 10 = *all occurred for both parents*); however, we felt that analyzing them separately would potentially provide more conceptual detail.

Peer Influences—Adolescents were asked how many of their friends use alcohol or drugs (at least once per month) and how many have been arrested before.

Age of First Substance Use—Adolescents were asked to report the age at which they first used alcohol and, separately, marijuana, with an option for "have not used."

Substance Use—At baseline and follow-up, a 3-month Timeline Followback (Sobell & Sobell, 1995) was administered for both alcohol and marijuana use. Alcohol use is measured

as the number of heavy drinking days, and marijuana use is measured as the average number of joints smoked per week.

DAS—The DAS is based on the work of Dembo and colleagues (Dembo & Schmeidler, 2003; Dembo, Walters, & Meyers, 2005) and on the Self-Report Delinquency scale (SRD) by Elliott, Huizinga, and colleagues (Elliott, Huizinga, & Ageton, 1985; Huizinga, 1991; Huizinga & Esbensen, 1988). Items were added from the *Diagnostic and Statistical Manual*, fourth edition (*DSM-IV*; American Psychiatric Association, 1994).

The DAS evaluates a range of antisocial behaviors in youth and provides CD diagnosis as related to *DSM-IV*. The DAS is a 37-item instrument used to assess the number of times antisocial behaviors were committed in the year prior to incarceration, and age at which the teen first and last committed the act. The final item, excluded from present analyses, focuses on whether the teen has remorse for his or her actions. The DAS was also administered at follow-up and covered the 3 months since release from incarceration. From this questionnaire, checklists for CD and ASPD were developed. Note that for teens who qualify for ASPD, CD is no longer an appropriate *DSM-IV* diagnosis. However, for purposes of this study, each participant's CD symptom count was obtained, as was age of CD onset (which is relevant for ASPD). See Reavy, Stein, Paiva, Quina, and Rossi (2012) for information on other scales available in the DAS.

Age of Onset for CD—CD age of onset was calculated from the ages at which acts were first committed, as assessed on the DAS. The *DSM-IV* classifies onset categorically, as childhood-onset or adolescent-onset types. To be consistent with this categorical approach, for analyses we used this form of classification along with a third category for participants not diagnosed.

Severity of CD—To assess severity, the DSM-IV creates three categories—mild, moderate, and severe—based in part on symptom count. There is relatively little empirical evidence supporting a categorical approach to severity, so symptom count was used as it provides for more statistical power, is a reasonable proxy for severity and removes judgment needed to determine what constitutes minor or considerable harm to others. CD severity was measured by counting the number of symptoms endorsed during the year before lockup, as assessed on the DAS.

Results

Kazdin (2006) has argued for the use of ES regardless of *p* values, so a levels were maintained at .05 or better. Although multiple analyses increase the likelihood for Type I error, our strongest results were at .01 or better, negating some of this risk.

Severity of CD

To examine whether CD severity is associated with parent factors, each parental influence (incarceration; history of substance abuse; problems with friends/family, work, and law because of substance use) was categorized as Yes or No (see Table 1) and one-way analyses of variance (ANOVAs) were performed on each variable (CD symptom count was the

dependent variable). ES is estimated from partial eta-squared (J. Cohen, 1988) and described as small (<.09), medium (.09 to .24), and large (.25). Table 2 indicates that two parent factors were significantly associated with CD symptom severity, and, as anticipated, both indicated that more problematic parents were associated with more CD symptoms (ES was small).

To examine whether CD severity is associated with more negative peer variables, the number of friends who use alcohol or drugs at least once per month and the number of friends who have been arrested were categorized using a quartile split. Two ANOVAs revealed severity was related to friend substance use (Table 2), with the significant difference ($p = .002$) found between the lowest group, with 0–1 friend ($M = 5.05$, $SD = 2.89$), and the highest group, with 13+ friends ($M = 7.41$, $SD = 2.94$). Severity was also related to number of friends arrested, with significant differences between the lowest group (0–1 friend; $M = 5.04$, $SD = 2.84$) and all three other groups: 2–4 friends ($M = 6.61$, $SD = 2.77$), 5–10 friends ($M = 6.79$, $SD = 3.20$), and 11+ friends ($M = 7.08$, $SD = 2.99$).

To examine the relationship with age of first alcohol use, adolescents were split into quartiles based on their age of first alcohol use. In contrast to expectations, an ANOVA revealed no significant differences in CD severity for either age of first alcohol use or age of first marijuana use (see Table 2).

Age of Onset for CD

For these analyses, participants were divided into three groups according to CD age of onset (child, teen, or none), and parent behaviors were categorized as present/absent (Table 3). Three χ^2 analyses were performed for substance-related problems with friends/family, work, and the law for fathers and separately for mothers. Table 4 provides detailed results and Φ values (estimated ESs are small $\Phi = 0:1$, medium $\Phi = 0:3$, and large $\Phi = 0:5$; J. Cohen, 1988). Two influences were significantly associated with younger age of onset: Father ever incarcerated and father's history of alcohol/drug abuse. Arcsine transformations were performed and differences were examined more closely with J. Cohen's (1988) h (ES: small = 0.2, medium = 0.5, and large = 0.8). For father's incarceration, all three age groups were different from each other with large ES for none–child ($h = 0.91$), medium for child–teen ($h = 0.51$), and small-medium for none–teen ($h = 0.40$). Child onset had the highest number of fathers who had been incarcerated, followed by teen onset. For father's history of substance abuse, a significant difference was found between none and teen ($h = 0.39$; small-medium ES), with teen onset associated with father history of substance abuse.

We predicted that, compared to adolescents with adolescent-onset CD, adolescents with childhood-onset CD would report more peers who use substances and more friends who have been arrested (similarly, those with no CD diagnosis would have fewer problematic peers). The number of friends who use substances and the number of friends who have been arrested were categorized using a quartile split. Chi-square tests found no significant associations between age of onset and either friend substance use or friend arrest (Table 4).

An ANOVA was conducted to compare the three groups varying by CD age of onset (none, child, and adolescent) on age of first alcohol use. The result was nonsignificant, as shown in

Table 4. The comparable ANOVA for age of first marijuana use was significant, with a small ES. A follow-up Tukey's test revealed a significant difference between child (M = 10.86 years, SD = 2.41) and teen onset (M = 12.43 years, SD = 2.27), indicating that the group diagnosed with childhood onset of CD also started using marijuana at a younger age.

Concurrent Incremental Validity

To control for the effects of age, race, peer influences, and age of first substance use, these variables were entered in the first regression model, followed by CD severity in Model 2. The second regression model also allows for an assessment of the importance of the newly entered variables through the calculation of F_{change}. Hierarchical regression was used to investigate the relationship at baseline between severity of CD and number of heavy drinking days; analyses were repeated for higher number of joints smoked.

Alcohol

Concurrent incremental validity for CD severity is shown in Table 5 for alcohol use. Predictors in the first model were not significant predictors of alcohol use, R^2 = .05, F(5, 174) 1.81, p > .05. The model was significant, R^2 = .09, F(6, 173) = 2.77, p = .013; β = .21, t(173) = 2.69, p = .008. Adding CD symptom count into the second model increased the R^2 by 3.8%, which was statistically significant, F_{change}(1, 173) 7.25, p = .008.

The same analyses were conducted to examine incremental validity with age of onset for CD. Results were nonsignificant for Model 1, Model 2, and the incremental contribution of CD onset.

Marijuana

Models 1 and 2 were significant, but the incremental contribution of CD severity in Model 2 was not significant (see Table 6). The same analyses were conducted to examine incremental validity with age of onset for CD. Although the initial model revealed a significant relationship with baseline marijuana use, Model 2 was not significant nor was the incremental contribution of CD age of onset.

Internal Reliability and Stability

The CD scale as a whole had acceptable internal consistency at baseline (α = .75) and follow-up (α = .71). Test–retest reliability (Pearson's r) calculated between baseline and=follow-up assessments were not significant: r = .099 (N = 188), p = .176. Subcategories of delinquent activities were coded to reflect the following constructs, based on *DSM-IV* criteria for CD: aggression to people and animals, destruction of property, deceitfulness or theft, and serious rule violations. Internal consistencies and reliabilities were calculated for these subcategories with the best results for aggression to people and animals: Baseline and follow-up α = .69 and .67, respectively, with r = .155 and p =.037 (N = 188).

Discussion

The DAS was assessed as a measure for diagnosing CD in terms of severity, measured by symptom count, and age of onset. Constructs noted to have important associations with the

disorder were included in the analyses, which included parent and peer influences and substance use.

CD severity, in terms of symptom count, was associated with more problematic parental influences, as anticipated. However, fewer specific influences were significantly related than hypothesized. Father's problems with work due to substance use and mother's problems with the law due to substance use related significantly to increased severity of CD, with small ESs; given the relatively high probability of Type 1 error, these results must be treated as preliminary. In contrast, peer influences were a significant influence: CD severity was related to friend substance use and friend arrest. The main sources of peer influences were found when adolescents had a large social environment of substance using peers (i.e., 13+ friends), and when they had more than one friend who had been arrested. Severity of CD was not related to age of first use of either alcohol or marijuana.

Similar analyses for CD age of onset found no significant effects for peers, and the only significant parental variables were father ever having been incarcerated and father's history of alcohol or drug abuse. However, adolescents with childhood onset (rather than adolescent onset) reported using marijuana at younger ages, with a strong association between CD age of onset and first marijuana use when first use was at age 10 or younger.

Taken together, these two sets of results suggest that on one hand, peers may greatly influence the number of CD symptoms an adolescent exhibits, but that on the other hand, current peers have no direct relation to CD age of onset within this sample. Whereas first substance use was unrelated to severity, it was significantly related to CD age of onset, with earlier initiation of marijuana use being significantly associated with earlier CD diagnosis. These tentatively suggest that parent-related constructs are associated with CD age of onset, and to a lesser extent with severity. On the other hand, while problematic peers are unrelated to CD age of onset, the significant relationship between more problematic peers and greater CD severity may reflect an adolescent's peer choices. These relationships provide preliminary evidence for the construct validity of the DAS to provide diagnostic information on CD.

The CD diagnoses derived from the DAS evidenced mixed results with respect to incremental concurrent validity. After holding demographics, peer influences, and age of first substance use constant, severity of CD was significantly and incrementally related to alcohol consumption (number of heavy drinking days) but not marijuana (average number of joints smoked per week). Similar analyses with CD age of onset found no incremental concurrent validity for either alcohol or marijuana use. We know of no other instruments assessing CD diagnosis that have been put to the rigorous test of incremental concurrent validity. Although analyses did not produce overwhelming evidence for incremental validity, the finding that some limited incremental concurrent validity was found for CD severity's association with number of heavy drinking days is noteworthy. The CD scale appears reliable, with adequate internal consistency at baseline ($\alpha = .75$) and follow-up ($\alpha = .71$), whereas only the aggression diagnostic criterion subcategory produced adequate internal =consistencies at baseline ($\alpha = .69$) and follow-up ($\alpha = .67$). Published data on comparable psychometrics for other assessments of antisocial behaviors in youth also show

a mixed pattern of internal consistency. Internal consistencies for the Millon Adolescent Clinical Inventory (Pinto & Grilo, 2004) subscales are reported to range from .73 to .91. Achenbach and Rescorla (2001) reported internal consistencies ranging from .63 to .94 on the Child Behavior Checklist (CBCL).

Test–retest reliability is difficult to compare to other scales, since other studies have based their psychometrics on relatively short intervals (4 to 21 days). Edelbrock, Costello, Dulcan, Kalas, and Conover (1985) found moderate test–retest reliability (average $r = .71$ for ages 14 to 18) over an average of 9 days (1 to 3 weeks) for the child report version of the DISC (Shaffer et al., 1996), with $r = .77$ for the CD subscale. Achenbach and Rescorla (2001) report 8-day test–retest reliabilities for CBCL (Achenbach, 1993) Rule-Breaking, Aggressive Behavior, and Conduct Problems subscales ranging from $r = .90$ to .93. Reliabilities for the present DAS-derived CD scale, as well as its *DSM-IV* diagnostic criteria subcategories, were much smaller and only the aggression subcategory reached statistical significance. These lower reliabilities may be due to the greater elapsed time in the present study, the fact that adolescents had received interventions between the two assessments, and that the assessments took place in two settings (baseline during incarceration, follow-up in the community).

Elliott, Huizinga, and Ageton (1985) discuss a preference to exclude internal reliabilities with clinical measures, particularly those like the SRD that list a number of possibly unrelated criteria. Huizinga and Elliott (1986) note that the SRD index is multidimensional with heterogeneous items. As such, they argue that with this and other self-reported delinquency measures, the use of split-half or other internal measures of consistency is inappropriate. The same may be argued regarding use of the DAS to provide CD diagnostic information; the items, which are selected to represent *DSM-IV* criteria, are not empirically based nor necessarily psychometrically related, since they are intended to aid in a clinical diagnosis. Furthermore, the items ask about frequencies of relatively low base rate behaviors, which would be expected to vary over time and circumstances. In spite of these cautions, the DAS CD scale and the diagnostic criterion subcategory for aggression are still valid for assessing clinically relevant behaviors at a given time. By offering this breadth of coverage, the DAS provides practical utility for researchers and clinicians who wish to efficiently assess an array of delinquent behaviors with and without substances involved (see Reavy et al., 2012) while at the same time also assessing CD diagnosis.

Limitations and Future Directions

Limitations of the study include small sample size relative to the types of analyses that were conducted. Future studies should seek to include more females and larger samples. With increased numbers of diverse participants, the items could be examined for racial or ethnic bias. In addition, this research should be extended to include adults diagnosed with ASPD. Assessing the DAS across settings will help determine reliability and validity as a more generally useful assessment instrument. In an effort to be thorough in the psychometric evaluation of CD diagnostic information, internal consistency and test–retest stability were provided. However, as was already noted, the test–retest period was lengthy (about 8 months), and adolescents received treatment between assessments. Future studies may wish

to assess CD for a 6-month period and use a 2-week test–retest period. This study relied on the use of self-report data. Several attempts were made to enhance the credibility of self-reports (see Reavy et al., 2012). Future research may test the DAS CD diagnostic information against a gold-standard diagnostic interview. With respect to CD age of onset categorization, the *DSM-IV* classifies onset as childhood- or adolescent-onset types, depending on whether the appearance of at least one criterion characteristic of CD occurred prior to 10 years of age. The DAS as used in this report classified childhood onset or adolescent onset depending on whether the *diagnosis* came prior to 10 years of age. Had the more liberal *DSM-IV* approach been used, more participants would have been classified with childhood onset; however, given issues surrounding recall, it was felt this approach provided for more certainty in classification. An important next step is to replicate results. The DAS may be of interest to clinicians and researchers as a diagnostic tool for CD, while simultaneously preserving an array of heterogeneous items assessing specific delinquent behaviors (see Reavy et al., 2012). Preliminary evidence for the DAS as a tool to provide diagnostic information on CD is promising. Generally, severity of CD symptom count and CD age of onset were significantly associated with the social influences and substance use items that were examined, and in the anticipated directions. Although limited evidence emerged for the incremental validity of the CD diagnostic information, we know of no other studies offering such rigorous validity testing of other tools' CD diagnostic information.

Conclusion

Strengths of current diagnostic measures of CD include that they are systematic compared to traditional unstructured clinical interviews, they collect temporal information such as symptom onset, and they adhere to diagnostic manuals. Weaknesses include that they are time-consuming, over-rely on diagnostic criteria with weak empirical basis, frequently require much training, and often demonstrate validity by comparing interview results with diagnoses made by experienced clinicians (Loney & Frick, 2003). In comparison, the DAS is also systematic, collects temporal information regarding symptom onset, and provides CD diagnosis based on *DSM-IV*. However, unlike other structured interviews, the DAS is relatively brief, contains empirically based scales measuring delinquency (Reavy et al, 2012), does not require intensive training, and demonstrates preliminary evidence for validity beyond clinician agreement. Practitioners and researchers alike may find it useful to obtain empirically based scales and provisional diagnosis in one measure. Youth may benefit by having a relatively short interview and by engaging in a process that provides not only diagnostic information but also scaled information on delinquency (see Reavy et al., 2012).

Acknowledgments

References

Achenbach TM. Implications of multiaxial empirically based assessment for behavior therapy with children. Behavior Therapy. 1993; 24:91–116.

Achenbach, TM.; Rescorla, LA. Manual for ASEBA school-age forms & profiles. Burlington: University of Vermont, esearch Center for Children, Youth, and Families; 2001.

American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4. Washington, DC: Author; 1994.

Barnes, GM.; Farrell, MP.; Dintcheff, BA. Family socialization effects on alcohol abuse and related problem behaviors among female and male adolescents. In: Wilsnack, S.; Wilsnack, R., editors. Gender and alcohol. Piscataway, NJ: Rutgers Center of Alcohol Studies; 1997. p. 156-175.

Blackson TC, Butler T, Belsky J, Ammerman RT, Shaw DS, Tarter RE. Individual traits and family contexts predict sons' externalizing behavior and preliminary relative risk ratios for conduct disorder and substance use disorder outcomes. Drug and Alcohol Dependence. 1999; 56:115–131. [PubMed: 10482403]

Boivin, N.; Vitaro, F. The impact of peer relationships on aggression in childhood: Inhibition through coercion or promotion through peer support. In: McCord, J., editor. Coercion and punishment in long-term perspectives. Cambridge, England: Cambridge University Press; 1995. p. 183-197.

Bucholz KK, Duncan AE, Grant JD, Haber JR, Heath A, Jacob T. Effect of paternal alcohol and drug dependence on offspring conduct disorder: Gene–environment interplay. Journal of Studies on Alcohol and Drugs. 2010; 71:652–663. [PubMed: 20731970]

Cohen, J. Statistical power analyses for the behavioral sciences. 2. Hillside, NJ: Lawrence Erlbaum; 1988.

Cohen P, Cohen J, Brook J. An epidemiological study of disorder in late childhood and adolescence: II. Persistence of disorders. Journal of Child Psychology and Psychiatry. 1993; 34:869–877. [PubMed: 8408372]

Dembo R, Schmeidler J. A classification of high-risk use. Crime and Delinquency. 2003; 49:201–230.

Dembo R, Walters W, Meyers K. A practice/research collaborative: An innovative approach to identifying and responding to psychosocial functioning problems and recidivism risk among juvenile arrestees. Journal of Offender Rehabilitation. 2005; 41:39–66.

Dembo R, Williams L, Wothke W, Schmeidler J. Examining a structural model of the relationships among alcohol use, marijuana/hashish use, their effects, and emotional and psychological problems over time in a cohort of high-risk youths. Deviant Behavior: An Interdisciplinary Journal. 1992; 13:185–215.

Edelbrock C, Costello AJ, Dulcan MK, Kalas R, Conover NC. Age differences in the reliability of the psychiatric interview of the child. Child Development. 1985; 56:265–275. [PubMed: 3987406]

Elliott, DS.; Huizinga, D.; Ageton, S. Explaining delinquency and drug use. Beverly Hills, CA: Sage; 1985.

Frick P, Lahey BB, Loeber R, Stouthamer-Loeber M, Christ MAG, Hanson K. Familiar risk factors to oppositional deviant disorder and conduct disorder: Parental psychopathology and maternal parenting. Journal of Consulting and Clinical Psychology. 1992; 60:49–55. [PubMed: 1556285]

Furgusson DM, Horwood LJ, Lynskey MT. Prevalence and comorbidity of DSM-III-R diagnoses in a birth cohort of 15 year olds. Journal of the American Academy of Child and Adolescent Psychiatry. 1993; 32:1127–1134. [PubMed: 8282656]

Herjanic B, Reich W. Development of a structured psychiatric interview for children: Agreement between child and parent individual symptoms. Journal of Abnormal Child Psychology. 1982; 10:307–324. [PubMed: 7175040]

Huizinga, D. Assessing violent behavior with self-reports. In: Milner, JS., editor. Neuropsychology of Aggression. Boston, MA: Kluwer Academic; 1991. p. 44-76.

Huizinga D, Elliott DS. Reassessing the reliability and validity of self-report delinquency measures. Quantitative Criminology. 1986; 2:293–327.

Huizinga, D.; Esbensen, F. Common measures of the program of research on the causes and correlates of delinquency. Washington, DC: Huizinga; 1988. Report to the Office of Juvenile Justice and Delinquency Prevention

Hunsley J, Meyer G. The incremental validity of psychological testing and assessment: Conceptual, methodological, and statistical issues. Psychological Assessment. 2003; 15:446–455. [PubMed: 14692841]

Kashani JH, Daniel AE, Sulzberger LA, Rosenberg TK, Reid JC. Conduct disordered adolescents from a community sample. Canadian Journal of Psychiatry. 1987; 32:756–760.

Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, … Ryan N. Schedule for Affective Disorders and Schizophrenia for School-Age Children: Present and Lifetime version (K-SADS-PL): Initial reliability and validity data. Journal of the American Academy of Child and Adolescent Psychiatry. 1997; 36:980–988. [PubMed: 9204677]

Kazdin AE. Practitioner review: Psychosocial treatments for conduct disorder in children. Journal of Child Psychology & Psychiatry. 1997; 38:161–178. [PubMed: 9232463]

Kazdin, AE. Treatment of antisocial behavior in children and adolescents. Homewood, IL: Dorsey; 1985.

Kazdin AE. Arbitrary metrics: Implications for identifying evidence-based treatments. American Psychologist. 2006; 61:42–49. [PubMed: 16435975]

Keenan K, Loeber R, Green S. Conduct disorder in girls: A review of the literature. Clinical Child and Family Psychology Review. 1999; 2:3–19. [PubMed: 11324095]

Kiesner, J.; Dishion, TJ.; Poulin, F. A reinforcement model of conduct problems in children and adolescence: Advances in theory and intervention. In: Hill, J.; Maughan, B., editors. Conduct disorders in childhood and adolescence. Cambridge, England: Cambridge University Press; 2001. p. 264-291.

Lahey BB, Loeber R, Quay HC, Applegate B, Shaffer D, Waldman I, … Bird HR. Validity of DSM-IV subtypes of conduct disorder based on age of onset. Journal of the American Academy of Child and Adolescent Psychiatry. 1998; 37:435–442. [PubMed: 9549965]

Loeber, R.; Farrington, DP.; Stouthamer-Loeber, M.; Van Kammen, WB. Antisocial behavior and mental health problems: Explanatory factors in childhood and adolescence. Mahwah, NJ: Lawrence Erlbaum; 1998.

Loeber, R.; Stouthamer-Loeber, M. Family factors as correlates and predictors of juvenile conduct problems and delinquency. In: Tonry, M.; Morris, N., editors. Crime and justice. Vol. 7. Chicago, IL: University of Chicago Press; 1986. p. 29-149.

Loney, B.; Frick, P. Structured diagnostic interviewing. In: Reyndolds, C.; Kamphaus, R., editors. Handbook of psychological and educational assessment of children: Personality, behavior, and context. 2. New York, NY: Guilford; 2003. p. 235-247.

Myers MG, Brown SA, Mott MA. Preadolescent conduct disorder behaviors predict relapse and progression of addiction for adolescent alcohol and drug abusers. Alcoholism: Clinical and Experimental Research. 1995; 19:1528–1536.

Patterson, GR.; Kapaldi, DM.; Bank, L. An early starter model predicting delinquency. In: Pepler, DJ.; Rubin, KA., editors. The development and treatment of childhood aggression. Hillsdale, NJ: Lawrence Erlbaum; 1991. p. 139-168.

Pinto M, Grilo C. Reliability, diagnostic efficiency, and validity of the Millon Adolescent Clinical Inventory: Examination of selected scales in psychiatrically hospitalized adolescents. Behaviour Research and Therapy. 2004; 42:1505–1519. [PubMed: 15500818]

Reavy R, Stein LAR, Paiva A, Quina K, Rossi JS. Validation of the delinquent activities scale for incarcerated adolescents. Addictive Behaviors. 2012; 37:875–879. [PubMed: 22464873]

Sechrest L. Incremental validity: A recommendation. Educational and Psychological Measurement. 1963; 23:153–158.

Shaffer D, Fisher P, Dulcan MK, Davies M. The NIMH Diagnostic Interview Schedule for Children version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA study. Journal of the American Academy of Child and Adolescent Psychiatry. 1996; 35:865–877. [PubMed: 8768346]

Sobell, LC.; Sobell, MB. Alcohol timeline followback users' manual. Toronto, Canada: Addiction Research Foundation; 1995.

Stein, LAR. Preliminary findings of a randomized clinical trial in a juvenile correctional setting; Paper presented at National Institute on Drug Abuse conference; Rockville, MD. 2004 Dec.

Stein LAR, Colby SM, Barnett NP, Monti PM, Golembeske C, Lebeau-Craven R, Miranda R. Enhancing substance abuse treatment engagement in incarcerated adolescents. Psychological Services. 2006; 3:25–34. [PubMed: 20617117]

Warr M, Stafford M. The influence of delinquent peers: What they think or what they do? Criminology. 1991; 29:851–866.

White HR, Xie M, Thompson W, Loeber R, Stouthamer-Loeber M. Psychopathology as a predictor of adolescent drug use trajectories. Psychology of Addictive Behaviors. 2001; 15:210–218. [PubMed: 11563798]

Table 1

Means and SDs for Conduct Disorder by Family and Peer Influences.

Item	Mean Severity	SD
Father ever incarcerated		
Yes	6.59	3.03
No	5.98	2.89
Mother ever incarcerated		
Yes	6.96	3.03
No	6.17	3.03
Father history of alcohol/drug abuse		
Yes	6.63	2.83
No	5.84	2.97
Mother history of alcohol/drug abuse		
Yes	6.81	3.11
No	6.16	2.98
Father problem with family and friends		
Yes	6.76	2.80
No	5.90	2.98
Mother problem with family and friends		
Yes	6.84	3.19
No	6.18	2.98
Father problem with work		
Yes	7.15	2.94
No	6.05	2.78
Mother problem with work		
Yes	7.04	3.11
No	6.23	3.02
Father problem with the law		
Yes	6.69	2.80
No	6.04	3.04
Mother problem with the law		
Yes	7.43	2.75
No	6.11	3.05
Friend use		
0–1 friend	5.05	2.89
2–5 friends	6.52	3.14
6–12 friends	6.23	2.63
13+ friends	7.41	2.94
Friend arrested		
0–1 friend	5.04	2.84
2–5 friends	6.61	2.77
6–12 friends	6.79	3.20

Item	Mean Severity	*SD*
13+ friends	7.08	2.99

Table 2

Conduct Disorder Severity.

Item	df	F	p	Partial η²
Father ever incarcerated	1, 164	1.44	.23	.009
Mother ever incarcerated	1, 184	2.33	.13	.012
Father history of alcohol/drug abuse	1, 165	2.65	.11	.016
Mother history of alcohol/drug abuse	1, 186	1.83	.18	.010
Father problem with family and friends	1, 164	3.64	.06	.022
Mother problem with family and friends	1, 184	1.55	.22	.008
Father problem with work	1, 158	5.41	.02*	.033
Mother problem with work	1, 184	1.47	.23	.008
Father problem with law	1, 159	1.94	.17	.012
Mother problem with law	1, 184	5.53	.03*	.029
Friend use	3, 185	4.70	.003*	.071
Friend arrested	3, 185	4.39	.005*	.066
Age first alcohol use	3, 178	2.54	.06	.041
Age first marijuana use	3, 185	2.24	.09	.035

Table 3

Frequencies for Age of Conduct Disorder Onset by Family and Peer Influences.

Item	No CD N (%)	Child Onset N (%)	Adolescent Onset N (%)
Father ever incarcerated			
Yes	21 (53.8)	11 (91.7)	84 (73.0)
No	18 (46.2)	1 (8.3)	31 (27.0)
Mother ever incarcerated			
Yes	9 (22.0)	6 (42.9)	31 (23.7)
No	32 (78.0)	8 (57.1)	100 (76.3)
Father history of alcohol/drug abuse			
Yes	21 (56.8)	5 (50.0)	90 (75.0)
No	16 (43.2)	5 (50.0)	30 (25.0)
Mother history of alcohol/drug abuse			
Yes	14 (34.1)	5 (35.7)	35 (26.3)
No	27 (65.9)	9 (64.3)	98 (73.7)
Father problem with family and friends			
Yes	17 (45.9)	6 (60.0)	70 (58.8)
No	20 (54.1)	4 (40.0)	49 (41.2)
Mother problem with family and friends			
Yes	12 (29.3)	5 (38.5)	26 (19.7)
No	29 (70.7)	8 (61.5)	106 (80.3)
Father problem with work			
Yes	11 (30.6)	4 (44.4)	39 (33.9)
No	25 (69.4)	5 (55.6)	76 (66.1)
Mother problem with work			
Yes	7 (17.1)	4 (28.6)	12 (9.2)
No	34 (82.9)	10 (71.4)	119 (90.8)
Father problem with the law			
Yes	16 (44.4)	6 (66.7)	72 (62.1)
No	20 (55.6)	3 (33.3)	44 (37.9)
Mother problem with the law			

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Item	No CD N (%)	Child Onset N (%)	Adolescent Onset N (%)
Yes	8 (19.5)	5 (35.7)	11 (16.8)
No	33 (80.5)	9 (64.3)	109 (83.2)
Friend use			
0–1 friend	10 (23.8)	0 (0.0)	30 (22.6)
2–5 friends	10 (23.8)	5 (35.7)	49 (36.8)
6–12 friends	9 (21.4)	3 (21.4)	27 (20.3)
13+ friends	13 (31.0)	6 (42.9)	27 (20.3)
Friend arrested			
0–1 friend	10 (23.8)	2 (14.3)	35 (26.3)
2–5 friends	7 (16.7)	2 (14.3)	45 (33.8)
6–12 friends	13 (31.0)	4 (28.6)	31 (23.3)
13+ friends	12 (28.6)	6 (42.9)	22 (16.5)

Note. CD = conduct disorder.

Table 4

Age of Conduct Disorder Onset.

Item	N	df	χ^2	p	Φ
Father ever incarcerated	166	2	8.02	.02[*]	.220
Mother ever incarcerated	186	2	2.72	.26	.121
Father history of alcohol/drug abuse	167	2	6.34	.04[*]	.195
Mother history of alcohol/drug abuse	188	2	1.30	.52	.083
Father problem with family and friends	166	2	1.97	.37	.109
Mother problem with family and friends	186	2	3.46	.18	.136
Father problem with work	160	2	0.63	.73	.063
Mother problem with work	186	2	5.47	.07	.172
Father problem with law	161	2	3.78	.15	.153
Mother problem with law	186	2	2.98	.23	.127
Friend use	189	6	8.48	.21	.212
Friend arrested	189	6	11.47	.08	.246
	N	df	F	p	Partial η^2
Age of first alcohol use	188	2, 187	1.70	.186	.018
Age of first marijuana use	188	2, 187	3.18	.044[*]	.033

Table 5

Concurrent Incremental Validity: Conduct Disorder Diagnosis and Alcohol.[a]

Model	R^2	R^2_{adj}	R^2	ANOVA	df	p
Alcohol use, 3 months before incarceration						
Background[b]	.050	.022	.050	$F = 1.81$	5, 174	.113
Number of CD symptoms	.088	.056	.038	$F = 2.77$	6, 173	.013
Incremental change				$F_{ch} = 7.25$	1, 173	.008
Alcohol use, 3 months before incarceration						
Background[b]	.050	.022	.050	$F = 1.81$	5, 174	.113
Age of CD onset	.058	.025	.008	$F = 1.77$	6, 173	.107
Incremental change				$F_{ch} = 1.55$	1, 173	.216

Note. ANOVA = analysis of variance; CD = conduct disorder.

[a] $N = 180$, due to participants missing one = or more predictor variables at baseline.

[b] Age, race, friend use, friend arrested, age of first alcohol use.

Table 6

Concurrent Incremental Validity: Conduct Disorder Diagnosis and Marijuana.[a]

Model	R^2	R^2_{adj}	R^2	ANOVA	df	p
Marijuana use, 3 months before incarceration						
Background[b]	.068	.041	.068	$F = 2.53$	5, 174	.031
Number of CD symptoms	.070	.037	.002	$F = 2.16$	6, 173	.049
Incremental change				$F_{ch} = 0.33$	1, 173	.568
Marijuana use, 3 months before incarceration						
Background[b]	.068	.041	.068	$F = 2.53$	5, 174	.031
Age of CD onset	.068	.036	.000	$F = 2.06$	6, 173	.054
Incremental change				$F_{ch} = 0.03$	1, 173	.746

Note. ANOVA = analysis of variance; CD = conduct disorder.

[a] N = 180 due to participants missing one or more predictor variables at baseline.

[b] Age, race, friend use, friend arrested, age of first marijuana use.