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Psychometric evaluation of a brief parent- and teacher-rated screen for children at risk of conduct disorder[1]

Melissa E. Duncombe[2], Sophie S. Havighurst
The University of Melbourne
Kerry A. Holland
Bendigo Health, Victoria
Emma J. Frankling
Austin Health, Victoria

ABSTRACT

This study examined the psychometric properties of the Conduct Problems Risk Screen (CPRS), a seven-item screen derived from DSM-IV-TR criteria that can be completed by parents or teachers. The sample consisted of 4,752 Australian five- to nine-year-old primary school children. The results showed the parent and teacher screens had very good internal consistency and high convergent validity with other well-established measures. The CPRS also showed good discriminant validity and moderate inter-rater reliability. The CPRS is a valid and reliable instrument and could be used effectively as a screening tool to identify those children at risk of developing conduct disorder.

Key words: conduct problems, screening, behaviour ratings, prevention/early intervention evaluation

INTRODUCTION

Conduct disorder is one of the most concerning psychosocial problems among Australian youth. In a national epidemiological study it has been reported that the prevalence rate of conduct disorder is approximately 4.4% for boys and 1.6% for girls (Sawyer et al., 2001). Findings from the 2008 School Entrant Health Questionnaire data suggest that 4.5% of parents in the state of Victoria are concerned about their child's behaviour (Department of Education and Early Childhood Development, 2009). High levels of behaviour problems in children can hinder emotional and social development and can be the beginning of a trajectory that persists into adulthood (Diamantopoulou, Verhulst, & van der Ende, 2010). Early childhood is a particularly important time for intervention as conduct problems become increasingly resistant to change over time. Research has shown that early targeted interventions, which focus on high-risk children in community-based settings such as primary schools, can help to reduce behaviour problems (e.g., Webster-Stratton, Reid, & Hammond, 2004). However, the success of targeted interventions depends on the accurate detection of those at risk. Therefore, it is essential to have empirically supported methods for identifying children at risk of developing conduct disorder. This paper presents a new brief screening

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[2] Contact
Melissa E. Duncombe,
Psychological Sciences,
The University of Melbourne,
801 Swanston Street, 3053, Victoria, Australia.
Email: melissaduncombe@optusnet.com.au
Phone:++61 3 9812 2276.
Fax: ++61 3 9879 9630.

tool completed with a large Australian early childhood population covering metropolitan, rural, and regional settings.

Rationale

Screening instruments that identify behaviour problems may be used by appropriate agencies for a number of reasons including identification of those in greatest need of intervention, data gathering (e.g., population surveys), or prospective research (e.g., evaluating the efficacy of an intervention program). Screening tools should ideally be easily administered and be designed for use in time-pressured environments, such as schools, where population coverage can be maximized. Teachers and parents are best placed to screen for behavioural problems in young children since they can observe them in a range of different settings. The transition to primary school invariably involves exposure to new and challenging situations and affords an opportune time to screen for behaviour problems and, where appropriate, to deliver preventative or early intervention programs.

There is theoretical and empirical research to suggest attention-deficit/hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) are developmental precursors of conduct disorder (e.g., Loeber, Green, Lahey, Frick, & McBurnett, 2000). The behaviours that define these disorders include inattentive-hyperactive/impulsive behaviour (e.g., cannot pay attention for long, cannot sit still), oppositional behaviour (e.g., argues too much, loses temper easily), and conduct problems (e.g., bullying). A review of the literature found that ODD in early childhood magnifies the risk for later conduct disorder (e.g., Biederman et al., 2008). The research is less conclusive about the role of ADHD symptoms in predicting later conduct problems. Whereas some findings suggest a direct link between ADHD behaviours in early childhood and later conduct disorder (Pardini, Obradovic, & Loeber, 2006) other findings suggest that ADHD leads to increased risk for conduct disorder only when criteria for ODD are also met (Rowe, Maughan, Pickles, Costello, & Angold, 2002). Other studies suggest that the single best predictor of later conduct disorder is early conduct problems (between 4-7 years) and that early inattentive–hyperactive/impulsive or oppositional behaviours on their own play a negligible role in predicting conduct problems in middle and late childhood (Lahey, Van Hulle, Rathouz, Lee Rodgers, D'Onofrio, & Waldman, 2009). Overall, it is reasonable to conclude that children in the early years of primary school who display a combination of conduct problems and inattentive and oppositional behaviours are at risk of developing conduct disorder. Whilst early conduct problems may be the single best predictor of conduct disorder, children with co-occurring symptoms of ODD and ADHD are likely to experience more severe and enduring problems (Waschbusch, 2002).

Current Screening Tools

There are a number of different parent- and teacher-reported rating scales available to record the occurrence of behavioural problems in children. They differ in conceptual framework, item content, and administration time, and have a range of strengths and weaknesses. Some are not specifically related to clinical criteria as outlined in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR: APA, 2000), a widely used and well established method of classifying psychiatric disorders. Others do not provide comparable parent and teacher versions or are relatively cumbersome to complete. Some are based on small, clinical samples.

One of the most popular behaviour rating scales is the 25-item Strengths and Difficulties Questionnaire (SDQ: Goodman, 1997). It can be completed by different informants, i.e., parents, teachers, and adolescents, and is available in over 40 languages. The validity and reliability of the SDQ has been demonstrated across different cultures in community and clinical samples and has been used in population health surveys in the U.S., U.K., and Germany (e.g., Woerner, Becker, & Rothenberger, 2004). In Australia, the SDQ is used in the Victorian Child Health and Wellbeing Survey (a triennial, state-wide telephone survey launched in 2006) and the New South Wales Child Health Survey. It is also included in the School Entrant Health Questionnaire, distributed as part of a state-wide screening service by the Victorian Primary School Nursing Program.

Other behaviour rating scales, such as the 118-item Child Behaviour Checklist (CBCL: Achenbach, 1991) and the 36-item Eyberg Child Behaviour Inventory (ECBI: Eyberg & Robinson, 1983), have also been used for screening purposes and have well-established validity and reliability. As with the SDQ, they are based on a combination of behavioural symptoms but are not mapped against DSM criteria, although Achenbach (2003) has developed six scales corresponding with DSM-IV-TR disorders including ADHD

problems, ODD problems, and conduct problems. In comparison to other rating scales, however, the CBCL takes longer to complete and has been reported to contain item overlap and items that are redundant (Lengua, Sadowski, Friedrich, & Fisher, 2001). The 45-item Disruptive Behaviour Disorders Scale (DBDS: Pelham, Gnagy, Greenslade, & Milich, 1992) and the 41-item Rating Scale for Disruptive Behaviour Disorders (RS-DBD: Silva et al., 2005) focus specifically on DSM diagnostic criteria. However, the parent and teacher versions of the DBDS are dissimilar in item content and its clinical utility is restricted to ADHD or ODD behaviours. The RS-DBD provides equal coverage across DSM-IV-TR ADHD and disruptive behaviour disorders, however is based on a small, clinical sample of children who are aged between 5 and 17 years. Another commonly employed rating scale is the Conners' Rating Scale—Revised (CRS-R: Conners, 1997). It contains both long (parent version, 80 items; teacher version, 59 items) and short versions (parent version, 27 items; teacher version, 28 items). However, item coverage primarily relates to ADHD-related behaviours.

Shorter screening tools exist that can be used reliably with child community populations to detect those who exhibit behaviour problems. For example, the IOWA version of the Conners' Teacher Rating Scale created from the original Conners' Teacher Rating Scale, contains ten items measuring the frequency of inattentive-impulsive and oppositional behaviours. It has high internal consistency and adequate test-retest reliability for teacher raters and recent investigation by Waschbusch and Willoughby (2008) of a comparable parent rating scale produced similar results. However, the IOWA is not related to current DSM-IV-TR diagnostic criteria nor does it contain any symptoms of conduct disorder. The 12-item teacher-rating instrument developed by Dodge and Coie (1987) also has good internal consistency and construct validity for two types of aggression. However, it was not designed as a tool to assist in the early detection of behaviour problems and it focuses specifically on behaviour problems within a single setting (i.e., school). This fails to acknowledge that conduct problems can be situational (e.g., present at school but not at home, or vice versa). The Parent's Check List is a six-item scale derived from the 12-item instrument developed by Dodge and Coie. It is used by the Fast Track program (Conduct Problems Prevention Research Group, 1992), a large-scale trial of an intervention that targets high-risk school-age children. The item content consists of aggressive behaviour problems, which limits the ability to identify a broader range of risk behaviours, such as oppositionality and inattention that have also been shown to be predictors of conduct problems.

This review indicates a need for a brief screen of child problem behaviour that specifically identifies children at risk for conduct disorder across different settings. Ideally, this screen would combine the advantages of brevity with sound psychometric properties and the use of clinically relevant items based on current DSM nosology. It would also target both home and school environments. The current study outlines the validation of such a measure.

Item Content

In selecting the most appropriate items to include in a conduct problems risk screen, theoretical and empirical findings suggesting that co-occurrence of ADHD and ODD in early childhood magnifies the risk of conduct disorder was considered. Children aged between 5 and 9 years were targeted. This was based on the importance of early intervention in the treatment of behaviour problems and evidence that the median age of onset for many symptoms of ADHD and ODD, as well as some of the less serious symptoms of conduct disorder, is 5 years of age (Loeber, Green, Lahey, Christ, & Frick, 1992).

The Behavioural Disorders Screen Interview of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS: Kaufman et al., 1997) was chosen to form the basis of the Conduct Problems Risk Screen (CPRS). The K-SADS Screen Interview is a semi-structured instrument designed to screen children for the primary symptoms of ADHD, ODD, and conduct disorder according to DSM-IV criteria. All three items from the section on ODD behaviours were included in the content: "Does (the) child get upset easily and lose his/her temper?", "Does he/she argue a lot with you?" and "Does he/she get into trouble for not following the rules?" Two of four items from the ADHD behaviours were included in the content: "Does (the) child have trouble keeping attention on play activities?" and "Does (the) child act before he/she thinks?" Given recent findings of the role of early conduct problems in predicting conduct disorder in middle childhood (Lahey et al., 2009) one of five conduct disorder behaviours was used: "How often does (the) child fight with other children and bully them?" A number of the more serious conduct problems such as forced sex, theft by confrontation, running away from home,

and truancy were excluded because they were not thought likely to emerge until late childhood or adolescence (Loeber et al., 1992).

Following a literature review identifying social skills deficits (e.g., Coie, Terry, Lenox, & Lochman, 1995) as a further relevant domain in identifying conduct problems, a final item was added: "Does (the) child have trouble making and/or keeping friends?" This is similar to items found in other validated measures of child problem behaviour such as the Strengths and Difficulties Questionnaire and the Eyberg Child Behaviour Inventory.

Research Aim

The aim of this study was to examine the psychometric properties of a new brief screening measure aimed at identifying primary school-aged children at risk of developing conduct disorder. A single time point screening procedure was used and included both parent and teacher ratings. Specifically, two hypotheses were examined. First, it was hypothesized that the Conduct Problems Risk Screen would demonstrate good reliability for both parents and teachers. Second, it was hypothesized that scores on the CPRS would correlate with other well-established behavioural measures, and that it would not correlate with conceptually unrelated variables.

METHOD

Participants

The total sample consisted of 4,752 predominantly Caucasian children who were aged between 5 and 9 years. Children were recruited from a range of metropolitan, regional, and rural primary schools located in low to middle socio-economic deciles in the state of Victoria, Australia. Of the sample, parent data on the CPRS were available for 4,690 students, teacher data were available for 4,604 students, and complete parent and teacher data were available for 4,548 students. For both parent and teacher groups the gender ratio was identical (53.4% boys and 46.6% girls). Both the parent and teacher sample included 36% preparatory students (5-year-olds), which is the first year of formal schooling in Victoria, 28% first graders (6-year-olds), 28% second graders (7-year-olds) and 8% third graders (8-year-olds). Twenty-seven percent of parents of the total prep-grade 3 school population who were requested to provide screening data did not provide consent. The children of parents who did not consent to participate in the study did not appear to differ in behavioural functioning from those who did consent (according to teacher feedback) however data to evaluate this empirically was not available.

Of the 4,690 children who were screened by parent report, 662 (14.1%) met the at-risk criterion (i.e., a score at or above a z score of 1). Of 4,604 children who were screened by teacher report, 654 (14.2%) met the at-risk criterion. A proportion of these children (22.4%) were identified jointly by both parent and teacher as at risk (n = 241, 5.1% of total sample). Of the children identified by parent and/or teacher as at risk, 51% (n = 333) were administered the SDQ and ECBI, as well as a Wechsler short form of general intelligence and a specifically developed family background data tool prior to participation in a school-based early intervention group program. The remaining children were excluded because they had a pre-existing Autistic Spectrum Disorder, the maximum number of 8 children per school group had been reached, or they declined involvement.

Procedure

Data were collected as part of a large randomised controlled study evaluating the Bendigo Health and Austin Health Child and Adolescent Mental Health Services (CAMHS) and Schools Early Action (CASEA) intervention program. The CASEA program is an early intervention and prevention program, targeted at children with emerging disruptive behaviour in primary school settings using universal, targeted, and indicated approaches. Schools were recruited by contacting principals, through an expression of interest, and providing them with information about the CASEA program. Principals then met with their staff and subsequently contacted the CASEA coordinator if their school wished to participate. Forty-six schools volunteered to participate. Parents and teachers in all of the primary schools from prep to grade three were asked to complete the CPRS for each of the students in their classes according to each child's current functioning. Informed consent was obtained from parents and the principal of each school.

Measures

Conduct Problems Risk Screen (CPRS). The CPRS is a 7-item parent- and teacher-rated checklist that parallels the psychometrically supported K-SADS Screen Interview in terms of content and the Eyberg Child Behaviour Inventory in terms of rating descriptors. Items 1 and 4 cover inattentive/impulsive behaviours. Items 2 and 3 cover behaviours relating to bullying and social skills deficits, and items 5, 6, and 7 cover oppositional behaviours (see Table 1). The rating descriptors form a 5-point Likert scale where 0 = *never, 1 = rarely, 2 = sometimes,* 3 = *usually* and 4 = *almost always*, hence higher scores represent higher reported frequency of problem behaviours. The total score ranges from 0-28.

The following additional assessment measures were administered for those children who were identified as at risk on the CPRS and whose parents consented for early intervention involvement.

Family background data tool. The family background data tool asked parents/caregivers for demographic information regarding annual income, educational and occupational status, ethnicity, gender, marital status, and age of child.

Children's behavioural functioning. The Eyberg Child Behaviour Inventory (ECBI: Eyberg & Robinson, 1983) is a 36-item parent-report of disruptive behaviour problems that has two components: the Intensity score, which examines the frequency of behaviours on a 7-point Likert scale, and the Problem score, which provides an indication of whether the behaviour is a problem (yes/no response). The ECBI has been used extensively in research and has well-established construct and convergent validity and internal consistency.

The Strengths and Difficulties Questionnaire (SDQ: Goodman, 1997) is a well-known 25-item parent and teacher-report instrument using a 3-point Likert scale. It can be scored as a Total Difficulties score or into five subscales: Hyperactivity, Conduct Problems, Emotional Symptoms, Peer Problems, and Prosocial Behaviour. The SDQ has been shown to have moderate to strong internal consistency, sound external validity, and good test-retest reliability with an Australian population (Hawes & Dadds, 2006).

General intellectual functioning. General intellectual functioning was pro-rated using a two-subtest short form of the Wechsler Intelligence Scale for Children (WISC-IV: Wechsler, 2005) or the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-III: Wechsler, 2004), depending on the age of the child. The WISC-IV short form consisted of the Similarities and Arithmetic subtests and the WPPSI-III short form consisted of Matrix Reasoning and Information. Both the short-forms employed in the present study have excellent reliability (.92 and .92, respectively) and validity coefficients (.87 and .86, respectively).

Table 1: The Conduct Problems Risk Screen

		Never	Rarely	Sometimes	Usually	Almost Always
1.	Does the child have trouble keeping his/her attention on play/school-related activities?	0	1	2	3	4
2.	How often does the child fight with other children and bully them?	0	1	2	3	4
3.	Does the child have trouble making and/or keeping friends?	0	1	2	3	4
4.	Does the child act before he/she thinks?	0	1	2	3	4
5.	Does the child get upset easily and lose his/her temper?	0	1	2	3	4
6.	Does he/she argue a lot with you?	0	1	2	3	4
7.	Does he/she get into trouble at home/school for not following the rules?	0	1	2	3	4

Note. Parents/teachers circle the response that describes how often the situation currently applies to the child

RESULTS

Data analysis

Reliability was evaluated using Cronbach alpha values. Inter-rater reliability was estimated using intraclass correlation coefficients. Concurrent validity was examined using Pearson correlations with other established measures. Analysis of variance was used to examine the effects of grade and gender on the total risk score with post hoc tests on significant effects.

Preliminary Analyses

Prior to the analysis, all item responses were examined for missing values, normality, and outliers. Missing data was minimal, comprising 1.2% and 3.2% of the parent and teacher datasets, respectively. Person-mean imputation was used to replace missing items with mean values if at least 80% of the data was available. This approach preserves accurate estimates of variances and covariances (Bono, Ried, Kimberlin, & Vogel, 2007). The percentage of children rated as low, moderate, and high risk (i.e., one, one and a half, and two standard deviations above the mean, respectively) on the parent version of the Conduct Problems Risk Screen was 5.5%, 5.1%, and 3.3%, respectively. For the teacher version, 6.0%, 2.4%, and 5.4% of children were rated as low, moderate, and high risk, respectively. The mean total CPRS score was 10.0 (SD = 4.6) for the parent sample and 6.6 (SD = 5.6) for the teacher sample, which represented a statistically significant difference between the two types of ratings ($p < .001$).

A two-way ANOVA was conducted to explore the effect of gender and grade on problem behaviour as rated by parents and teachers. CPRS scores were significantly different ($p < .001$) between boys and girls, with boys obtaining higher overall risk ratings. This pattern was found for both parent, F (1, 4550) = 59.60, p = .000, and teacher ratings, F (1, 4469) = 210.61, p = .000. A statistically significant main effect was also found for grade for both parent, F (3, 4550) = 4.59, p = .003, and teacher ratings, F (3, 4469) = 2.75, p = .04, with more behaviour problems observed in older children. A significant interaction effect between gender and grade was found for the teacher report only, F (3, 4469) = 3.60, p = .013. Post-hoc analyses using Tukey's HSD procedure revealed that older (grade 3) boys had significantly higher risk scores compared to other children. The effect sizes (partial eta squared) of all ANOVA analyses were small (<.02) with the exception of the main effect for gender (teacher report only), which was medium (.05).

Internal consistency

Cronbach alpha coefficients were used to evaluate the internal consistency of the CPRS and were .83 (parent report) and .87 (teacher report). The presence of high overall internal consistency in both the parent and teacher sample supports the notion that the CPRS items tap strongly related constructs and that total scores can reliably be interpreted.

Inter-rater reliability

For 4,548 children (95.7% of the total sample) two independent ratings were provided by parent and teacher informants. The single measure intraclass correlation coefficient for the parent and teacher total score was .35 ($p < .001$), which suggests a moderate level of agreement between parents and teachers in overall risk ratings for the same child.

Convergent Validity

The convergent validity of the Conduct Problems Risk Screen was examined by correlating the total score with other measures of problem behaviour. The Pearson correlation matrix of the total score along with other behavioural measures including the Strengths and Difficulties Questionnaire (SDQ) and the Eyberg Child Behaviour Inventory (ECBI) are presented in Table 2. Findings were based on a sample of 333 children whose parents were administered the CPRS, and then the SDQ and ECBI following an interval of 6 weeks. Of these children, 265 were also rated by teachers using both the CPRS and the SDQ. Of the 333 children, the parents and teachers of 96 children were asked to complete the ECBI and the SDQ a second time, 12 months following the initial screen (teachers completed the SDQ only). These children were drawn from a waitlist control group that was part of a large early intervention trial. Participant rate was low with 48% of parents (n = 46) and 42% of teachers (n = 40) returning ratings. This rate of parental

Table 2: Convergent and Discriminant Validity of the Conduct Problems Risk Screen

	Parent Total Score		Teacher Total Score	
	Time 1[a]	Time 2[b]	Time 1[a]	Time 2[b]
Convergent Validity				
SDQ Prosocial Behaviour	-.33**	-.19	-.52**	-.60**
SDQ Conduct Problems	.42**	.63**	.66**	.62**
SDQ Peer Problems	.36**	.24	.34**	.61**
SDQ Hyperactivity	.36**	.39*	.55**	.44*
SDQ Emotion Symptoms	.26**	.41*	.13+	.29
SDQ Total Difficulties	.52**	.54**	.63**	.61**
ECBI Intensity	.59**	.54**		
ECBI Problem	.41**	.47**		
Discriminant Validity				
IQ	-.02		-.10	
Income	-.02		-.02	

Note: ** $p < .001$; * $p < .01$; + $p < .05$; [a] = 6 weeks post screen administration, $n = 333$ Parent sample, $n = 265$ Teacher sample; [b] = 12 months post screen administration, $n = 46$ Parent sample, $n = 40$ Teacher sample; SDQ = Strengths and Difficulties Questionnaire; ECBI = Eyberg Child Behaviour Inventory

participation is similar to that of other school-based studies (e.g., Waschbusch & Willoughby, 2008). Comparison of children with and without complete ratings across the two time periods showed that groups did not differ significantly on age, gender, or overall ratings of behaviour.

Significant positive correlations were found between the CPRS total score and all SDQ and ECBI subscales. In general, the highest Pearson correlation coefficients were obtained between similar measures (e.g., CPRS total score and SDQ Total Difficulties score). Findings also indicated that a similar proportion of children identified by the screen as at risk on initial assessment with the ECBI (62%) continued to exhibit problematic behaviour one year later upon re-assessment (54%). This indicates that the CPRS is a useful predictor of subsequent behaviours and confirms the relationship between at-risk behaviour (as determined by the CPRS) and disruptive behaviour problems as measured by the SDQ and the ECBI.

Discriminant Validity

The parent- and teacher-rated CPRS scores were compared to two conceptually unrelated variables, i.e., IQ and annual family income (see Table 2). As hypothesised, there were no significant correlations between the risk score and child IQ ($r = -.02$, $r = -.10$) or family income ($r = -.02$, $r = -.02$) for the parent and teacher report, respectively.

DISCUSSION

This is the first study of the psychometric properties of an informant-based screening tool for detecting sub-clinical problem behaviour in early primary school-age children. For screening tools to be helpful they should ideally be brief, clinically relevant, easy to administer, reliable, and valid. The CPRS contains only 7 items (taking only 1-2 minutes to complete), and is just under one quarter of the length of the SDQ. Items relate to DSM-IV-TR-specific information, and are drawn from the K-SADS, a well-established diagnostic measure, in order to maximise clinical relevance. They cover a number of problem behaviours identified in the literature as precursors to conduct disorder, including aggression, social skills deficits, inattention, and oppositionality. The internal consistency of the CPRS was .83 (parent-rated) and .87 (teacher-rated), indicating very good reliability, as expected. Evaluation of convergent validity indicated that the CPRS identified a statistically similar number of children with at-risk behaviour as the SDQ and ECBI. This supported the prediction that there would be a significant positive correlation between scores on both the parent- and teacher-rated CPRS and scores on the SDQ and ECBI. Also, as predicted, there were no significant correlations between the CPRS and two non-associated measures, indicating satisfactory discriminant validity.

In the current study, significant differences were found in the total risk score between parent and teacher report, with more problems generally reported by parents. Furthermore, only a moderate level of agreement was found between parents and teachers in overall risk ratings for the same child. Differences between parent and teacher ratings may reflect differences in the home and school environment, differences in the subjective perception of parents and teachers, or both. Teacher ratings are more likely to be based on behaviourally constrained situations and a broader comparison of same-aged children whereas parent ratings may be influenced by other factors such as a lack of environmental structure, poor parent mental health, economic adversity, sibling dynamics, and unrealistic expectations – all of which may lead to behaviour problems (Loeber et al., 2000).

The strengths of the study included a large sample size, the multiple types of validity assessed, and identical parent and teacher checklists that enable child behaviour to be evaluated across home and school. An additional strength is that the sample included metropolitan, rural, and regional populations, and an equal number of male and female participants. This increases the generalisability of the findings to community populations of Australian children aged between 5 and 9 years.

The screen items are drawn from a review of the theory and research surrounding the development of conduct disorder although it is important to acknowledge that behaviours such as temper tantrums, impulsivity, and oppositionality are part of normal and healthy development in children. Children who score more highly on the screen may be deemed ‘at risk’ for developing serious conduct problems, however they should not be stigmatised with the prospect of a disorder. The CPRS is not a diagnostic or prognostic tool. It is a checklist that has been specifically designed as an initial step for identifying children in need and to assist in the appropriate allocation of resources.

Limitations

There were a number of limitations with this study. First, the sample was drawn from a largely Caucasian, community-based, primary-school-age population with 60% of the children residing in urban settings and 40% residing in non-urban settings. While this distribution is comparable to that of the general Australian population, these findings should not be extrapolated to clinical populations or other racial/age groups without further empirical examination.

Second, it is possible that there was a significant difference between children whose parents consented to the study and those who did not. For instance, it may be that some parents declined involvement because they did not want to openly acknowledge their child’s problem behaviour. From the teacher’s perspective, however, all children whose parents consented to participate in the screening process and who exhibited behaviour problems of concern were identified in the screening process, ensuring that very few children with at-risk behaviour were missed.

Third, stability (i.e., test-retest reliability) of the CPRS total risk score was not measured. Given the variable nature of children’s behaviour, test-retest reliability would be best measured within a brief interval (i.e., 1 week), as changes in CPRS risk scores may reflect actual behaviour changes rather than instability in the reliability of the instrument.

Finally, the sampling methodology used to select participants excluded those who were not identified as 'at risk' from additional evaluation with the criterion measure (i.e., the SDQ and ECBI). This limited the ability of the study to evaluate the predictive accuracy of the CPRS. Specifically, negative predictive power (i.e., the proportion of those classified as low risk who do not develop clinically significant conduct problems) could not be evaluated.

Conclusion

This study of a parent- and teacher-rated 7-item problem behaviour screen makes a number of contributions that have considerable practical significance. First, the results show that the CPRS has good reliability and validity when used by parents and teachers. Second, the screen is brief and easy to administer. This makes it especially useful when (a) conducting screening assessments on a large number of children for the purpose of early intervention, (b) assessments are being administered repeatedly within short periods of time (e.g., treatment outcome studies), and (c) a large number of constructs are being measured at once (e.g., epidemiological surveys).

The development of a screening instrument, however, is a continuous process and additional investigation would strengthen the results of this study. Future studies might include the evaluation of children who screen negative, in order to determine negative predictive power and cut-offs based on optimal sensitivity and specificity values, as well as the screening of children who are between 9 and 12 years of age to extend coverage across all primary school. Given the impracticality of administering time-consuming questionnaires the CPRS may be a particularly useful tool for primary schools in their efforts to identify and assist those children whose behaviour places them at risk for adverse consequences.

REFERENCES

Achenbach, T. M. (1991). *Manual for the Child Behaviour Checklist/4-18 and 1991 Profiles.* Burlington: University of Vermont, Department of Psychiatry.

Achenbach, T. M., Demenci, L., & Rescorla, L.A. (2003). DSM-oriented and empirically based approaches to constructing scales from the same item pools. *Journal of Clinical Child and Adolescent Psychology, 32,* 328-340.

American Psychological Association (2000). *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition, Text Revision.* Washington, DC: American Psychiatric Association.

Biederman, J., Petty, C.R., Dolan, C., Hughes, S., Mick, E., Monuteaux, M.C., & Faraone, S.V. (2008). The long-term longitudinal course of oppositional defiant disorder and conduct disorder in ADHD boys: Findings from a controlled 10-year prospective longitudinal follow-up study. *Psychological Medicine, 38,* 1027-1036.

Bono, C., Ried, L. D., Kimberlin, C., & Vogel, B. (2007). Missing data on the Center for Epidemiologic Studies Depression Scale: A comparison of 4 imputation techniques. *Research in Social and Administrative Pharmacy, 3,* 1-27.

Coie, J., Terry, R., Lenox, K., & Lochman, J. (1995). Childhood peer rejection and aggression as predictors of stable patterns of adolescent disorder. *Development and Psychopathology, 7,* 697-713.

Conduct Problems Prevention Research Group (1992). A developmental and clinical model for the prevention of conduct disorders: The FAST Track Program. *Development and Psychopathology, 4,* 509-527.

Conners, C. K. (1997). *Conners' Rating Scales-Revised Technical Manual.* North Tonawanda: Multi-Health Systems Inc.

Department of Education and Early Childhood Development (2009). *The state of Victoria's children 2009.* Retrieved November 23, 2010, from http://www.education.vic.gov.au/about/directions/children/newdata.htm

Diamantopoulou, S., Verhulst, F. F., & van der Ende, J. (2010). Testing developmental pathways to antisocial personality problems. *Journal of Abnormal Child Psychology, 38,* 91-103.

Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology, 53,* 1146-1158.

Eyberg, S. M. & Robinson, E. A. (1983). Conduct problem behaviour: Standardization of a behavioural rating scale with adolescents. *Journal of Clinical Child Psychology, 11,* 130-137.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38,* 581-586.

Hawes, D. J. & Dadds, M. R. (2006). Assessing parenting practices through parent-report and direct observation during parent-training. *Journal of Child and Family Studies, 15,* 555-568.

Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., et al. (1997). 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 & Adolescent Psychiatry, 36,* 980-988.

Keenan, K., Wakschlag, L. S., Danis, B., Hill, C., Humphries, M., Duax, J., et al. (2007). Further evidence of the reliability and validity of DSM-IV ODD and CD in preschool children. *Journal of the American Academy of Child & Adolescent Psychiatry, 46,* 457-468.

Lahey, B. B., Van Hulle, C. A., Rathouz, Lee Rodgers, J., D'Onofrio, B. M., & Waldman, I. D. (2009). Are oppositional-defiant and hyperactive-inattentive symptoms developmental precursors to conduct problems in late childhood?: Genetic and environmental links. *Journal of Abnormal Child Psychology, 37,* 45-58.

Lengua, L. J., Sadowski, C. A., Friedrich, W. N., & Fisher, J. (2001). Rationally and empirically derived dimensions of children's symptomatology: Expert ratings and confirmatory factor analyses of the CBCL. *Journal of Consulting and Clinical Psychology, 69,* 683-698.

Loeber, R., Green, S. M., Lahey, B. B., Christ, M. A., & Frick, P. J. (1992). Developmental sequences in the age of onset of disruptive child behaviours. *Journal of Child and Family Studies, 1,* 21-41.

Loeber, R., Green, S. M., Lahey, B. B., Frick, P. J., & McBurnett, K. (2000). Findings on disruptive behaviour disorders from the first decade of the Developmental Trends Study. *Clinical Child & Family Psychology Review, 3,* 37-60.

Pardini, D., Obradovic, J., & Loeber, R. (2006). Interpersonal callousness, hyperactivity/impulsivity, inattention, and conduct problems as precursors to delinquency persistence in boys: A comparison of three grade-based cohorts. *Journal of Clinical Child and Adolescent Psychology, 35,* 46-59.

Pelham, W. E., Gnagy, E. M., Greenslade, K. N., & Milich, R. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behaviour disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 31,* 210-218.

Rowe, R., Maughan, B., Pickles, A., Costello, E. J., & Angold, A. (2002). The relationship between DSM-IV oppositional defiant disorder and conduct disorder: Findings from the Great Smoky Mountains study. *Journal of Child Psychology and Psychiatry. and Allied Disciplines, 43,* 365-373.

Sawyer, M. G., Arney, F. M., Baghurst, P. A., Clark, J. J., Graetz, B. W., Kosky, R. J. et al. (2001). The mental health of young people in Australia: Key findings from the child and adolescent component of the national survey of mental health and well-being. *Australian & New Zealand Journal of Psychiatry, 35,* 806-814.

Silva, R. R., Alpert, M., Pouget, E., Silva, V., Trosper, S., Reyes, K., et al. (2005). A rating scale for disruptive behaviour disorders, based on the DSM-IV item pool. *Psychiatric Quarterly, 76,* 327-339.

Waschbusch, D. A. & Willoughby, M. T. (2008). Parent and teacher ratings on the IOWA Conners Rating Scale. *Journal of Psychopathology and Behavioural Assessment, 30,* 180-192.

Waschbusch, D. D. (2002). A meta-analytic examination of comorbid hyperactivity-impulsive-attention problems and conduct problems. *Psychological Bulletin, 128,* 118-149.

Webster-Stratton, C., Reid, M. J., & Hammond, M. (2004). Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. *Journal of Clinical Child and Adolescent Psychology, 33,* 105-124.

Wechsler, D. (2004). *WPPSI-III Australian.* Marrickville, NSW: The Psychological Corporation.

Wechsler, D. (2005). *WISC-IV Australian.* Marrickville, NSW: The Psychological Corporation.

Woerner, W., Becker, A., & Rothenberger, A. (2004). Normative data and scale properties of the German parent SDQ. *European Child and Adolescent Psychiatry, 13,* 3-10.

Contact details for Co-authors::

Sophie S. Havighurst Mindful: Centre for Training and Research in Developmental Health, Department of Psychiatry, The University of Melbourne, 50 Flemington Street, Flemington, 3031, Victoria, Australia. Email: sshavi@unimelb.edu.au
Kerry A. Holland Bendigo Child and Adolescent Mental Health Service and Schools Early Action (CASEA), Bendigo Health, 8 Wallace Avenue, PO Box 78, Strathdale, 3550, Victoria, Australia. Email: KHolland@bendigohealth.org.au

Emma J. Frankling Austin CASEA, Austin Health, 300 Waterdale Road, PO Box 5444, Heidelberg West, 3081, Victoria, Australia. Email: Emma.FRANKLING@austin.org.au