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Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS-PL) for the Assessment of Preschool Children- A Preliminary Psychometric Study

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Abstract

Objective—To assess the psychometrics of the Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime Version (KSADS-PL) in diagnosing DSM-IV psychiatric disorders and subsyndromal symptomatology in preschool children.

Method—Parents were interviewed about their children using the KSADS-PL, and they completed the Early Childhood Inventory-4 (ECI-4) and Child Behavior Checklist for Ages 1½–5 Years (CBCL). Discriminant, divergent, and convergent validity of the KSADS-PL were evaluated in 204 offspring ages 2–5 years old of parents from an ongoing study. Inter-rater reliability as well as predictive validity of intake diagnoses at second assessment approximately two years after intake were evaluated. Fourteen children were also assessed by the Preschool Age Psychiatric Assessment (PAPA).

Results—Children who were diagnosed with Oppositional Defiant Disorder, Attention Deficit Hyperactivity Disorder, anxiety, mood, or elimination disorders had significantly higher scores on the ECI-4 than children without these disorders. Significant correlations were found for all convergent CBCL scales. Divergent validity was acceptable for emotional disorders. Inter-rater kappa coefficients for all diagnoses were good. Above noted results were similar for children with at least one positive KSADS-PL key screen symptom. A significantly higher percentage of children with an intake diagnosis had a diagnosis approximately two years after intake compared to those without an intake disorder. Overall, there was consistency between the PAPA and the KSADS-PL.

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Conclusions—Pending further testing, the K-SADS-PL may prove useful for the assessment of psychopathology in preschoolers.

Keywords

KSADS-PL; preschoolers; psychopathology; reliability; validity; psychometrics

INTRODUCTION

There is a growing awareness that anxiety, depression, and behavioral disorders occur in preschool children (Egger & Angold, 2006; Gadow et al., 2001; Henin et al., 2005; Keenan et al., 1997; Lavigne et al., 1996; Luby et al., 2004a; Roberts et al., 1998) with the prevalence of "any psychiatric disorders" ranging from 16 % to 26% in 2 to 5 year old preschool children in non-psychiatric settings (Egger and Angold, 2006).

With growing awareness of the intergenerational transmission of major psychiatric disorders, and demonstration of temperamental and biological differences in young children at risk for these disorders, identification of the earliest manifestation of disorder is extremely important, both for purposes of research, and with regard to prevention and treatment.

Current interviews for the assessment of psychopathology in preschoolers include the Preschool Age Psychiatric Assessment (PAPA; Egger & Angold, 2004; Egger et al., 2006) and the Diagnostic Interview Schedule for Children Version IV, modified for young children (DISC-IV-YC; Lucas et al., 1998). Both of these instruments are fully-structured interviews and the diagnoses are generated through a computer algorithm. Thus, the addition of a semistructured diagnostic interview which mimics the regular clinical interview and whose final diagnoses are done through a diagnostic consensus, such as the Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime Version (KSADS-PL) (Kauffman et al.1997), will give extra flexibility to the clinicians/researchers to further evaluate the differential diagnosis of each symptom in the context of the normal development and the environment of the child. This would provide a valuable additional tool for the assessment of psychopathology in preschoolers. Moreover, since the KSADS is widely used for children and adolescents ages 6-18 years old, using the same instrument to longitudinally assess a child from the preschool years through adolescence would enhance data collection and analysis. The use of the KSADS in preschoolers would therefore reduce method variance in trying to establish continuity and discontinuity between preschool and later childhood conditions, and also would be useful in defining the limits of phenotypes, given emerging evidence of very early manifestations of anxiety, mood, and other disorders (Egger & Angold, 2006).

The KSADS-P (present version) has been used to ascertain specific diagnoses including oppositional defiant disorder (ODD) and conduct disorder (CD) (Keenan & Wakschlag, 2004; Kim-Cohen et al., 2005); attention deficit hyperactivity disorder (ADHD) (Lahey et al., 1998); major depressive disorder (MDD) (Luby et al., 2003), dysthymic disorder (Kashani et al., 1997), and post-traumatic stress disorder (PTSD) (Scheeringa et al., 2001). Also, few studies have used the KSADS-E (epidemiological version) (Orvaschel et al., 1994) as a tool to interview parents about possible psychopathology in preschool children (Keenan & Wakschlag, 2004; Henin et al. 2005). However, with the exception for the psychometrics of the KSADS-P for some of the above-noted specific disorders, the psychometrics of the KSADS-PL for the ascertainment of psychiatric disorders in preschoolers has not been widely evaluated.

The purpose of this pilot study was to extend prior KSADS preschool studies assessing the psychometrics for general psychopathology of preschool children as reported by their parents using the KSADS-PL. Since it is important not to only evaluate the convergent and divergent validity of the diagnoses generated through the KSADS-PL against instruments that yield categorical diagnoses such as the Early Childhood Inventory-4 (ECI-4) (Gadow & Sprafkin, 1997; Gadow et al., 2001; Sprafkin et al., 2002), the KSADS-PL will be compared with a dimensional instrument, the Child Behavior Checklist for Ages 1½–5 Years (CBCL; Achenbach & Rescorla, 2000). This is particularly important because clinically significant individual symptoms that present at an early age but do not meet full threshold for a Diagnostic and Statistical Manual-IV (DSM-IV; APA, 1994) disorder may herald the development of future syndromic psychopathology. For the same reason, we will also evaluate the psychometrics of the KSADS-PL screens (see Methods below). It was hypothesized that the KSADS-PL will show good psychometric properties and could be reliably used with preschoolers. Children with mood/anxiety symptoms will show similar diagnoses in the ECI-4 and significantly higher scores in the internalizing and respective subscales of the CBCL, and lower scores in the externalizing subscales of the CBCL. In contrast, children with behavioral disorders will have higher scores on the externalizing subscale of the CBCL and more disruptive disorders in the ECI-4.

METHODS

Subjects

The sample consisted of 2- to 5-year-old children of parents with and without psychopathology consecutively recruited for an ongoing National Institute of Mental Health (NIMH)-funded study, the Bipolar Offspring Study (BIOS) (MH 60952, Principal Investigator: Boris Birmaher). These children were recruited from parents with bipolar disorder mainly ascertained through advertisement and from a random community control sample of community parents. The results of the comparison of these two groups of children will be presented in a different paper. The central focus of this article is the psychometrics of the KSADS for the entire sample of preschool children.

Two-hundred and four (204) 2- to 5-year-old preschool children (mean age 3.8 ± 1.2 years old) (109 from parents with BP and 95 from control parents) were included. Forty-nine percent (49%) were female; 81% Caucasian, and on average were from middle (2.9 ± 1.3) socioeconomic status (SES) families (Hollingshead, 1975). One hundred forty-five children (71%) lived with both biological parents and 106 (52%) attended daycare or preschool programs. The mother was the reporter for 97% of the children. To date, 126 children have had a follow-up assessment with a mean time of 2.1 ± 0.6 years since intake interview.

Procedures

After approval by The University of Pittsburgh Institutional Review Board informed consent was obtained from all parents.

Parents were interviewed about their children's lifetime (present and past) DSM-IV disorders using the KSADS-PL (Kaufman et al., 1997). Briefly, the KSADS-PL consists of screens and supplemental diagnostic assessments for 20 psychiatric disorders (for the KSADS-PL and instructions about its administration see www.wpic.pitt.edu/research under assessments). Each screen includes key symptoms for each disorder (Kaufman et al., 1996). If a subject screens positive for a key symptom, a supplement with the remaining DSM-IV symptom criteria for the specific disorder is administered. To screen positive, a score of "3" (threshold) must be given for *at least one* past or current clinically significant symptom of the disorder. For this paper, 'positive screen' will refer to this result. Definite "lifetime" diagnoses were given if the

child met criteria for a past and/or current diagnosis. Enuresis and encopresis (i.e., elimination disorders) were diagnosed if the child met the DSM-IV eligible age (4-years-old and 5-years-old, respectively).

To evaluate in more detail the *severity* of the worst lifetime mood symptoms, the Kiddie Mania Rating Scale (K-MRS; Axelson et al., 2003) and the depression section of the K-SADS-Present Episode version (K-DEP; Chambers et al., 1985) were used. In contrast with the KSADS-PL, these two instruments contain approximately six anchors per symptom item with severity ratings ranging from 'None' to 'Extreme' (for cut-off values for positive symptoms see (www.wpic.pitt.edu/research under assessments). All KSADS-PL mania and depression screen items are captured in the K-MRS and K-DEP, respectively. Therefore, instead of the KSADS-PL mood section, only ratings from the K-MRS and K-DEP were used for the analyses.

All KSADS interviews were completed by experienced bachelor's- or master's-prepared interviewers under the supervision of the child psychiatrists involved in the study. Child psychiatrists instructed the interviewers on how to ask developmentally appropriate questions to parents regarding their childrens' psychopathology. The KSADS includes many examples of questions that the interviewer may use to assess each symptom. Also, since this instrument is semi-structured, the interviewer may use their own questions. Although most KSADS prompts and cut-off scores seem appropriate for preschoolers, the interviewers were instructed not to use prompts that were inappropriate for preschool children and to take into account whether any endorsed symptom was above and beyond of what is expected from a preschool child. For example, for preschool children it is not appropriate to ask questions about symptom like perpetrating sexual assault or using weapons as in the case of conduct disorders, or excessive spending money during mania. Equally important, as indicated in the KSADS instructions, the interviewers presented the results of each KSADS to a child psychiatrist and it was the child psychiatrist that ultimately decided whether a child fulfilled DSM-IV criteria for any particular disorder. If the symptoms of any disorder were not clear, the interviewers called parents again to obtain further information and the case was again presented to the child psychiatrists for diagnostic consensus.

Most assessments were conducted in the subjects' homes. When necessary, subjects' medical records were obtained and reviewed. To ensure blindness to parental diagnoses, the diagnoses of parents and their offspring were assessed by different interviewers.

Seven KSADS assessments of preschoolers were audiotaped for the purpose of obtaining interrater reliability estimates. A range of 3–6 raters assessed each interview. In rating audiotapes, interviewers were blind to all initial interview results about the child. Kappas are presented below.

As noted above, to evaluate the convergent and divergent validity of the KSADS-PL, the parents were asked to complete the ECI-4 and CBCL for $1\frac{1}{2}$ –5 year-old children. These rating scales were selected because of their established reliability and validity, the range of categorical and dimensional psychopathology assessed, and their ease of use. The ECI-4 parent rating scale is an established instrument with adequate psychometric properties used to evaluate DSM-IV psychiatric disorders in preschoolers (Gadow & Sprafkin, 1997; 2000; 2001; 2002). It contains screens for 21 childhood emotional and behavior disorders which include the behavioral symptoms of most relevant DSM-IV psychiatric disorders for this age group. Since there is one-to-one correspondence between the ECI-4 items and DSM-IV symptoms, the ECI-4 has high content validity. The ECI-4 is scored in two different ways: Symptom count and symptom severity scores. The symptom count scores are sums of those symptoms rated as occurring "often" or "very often", and matched against a screening cut-off score. To obtain a symptom

severity score, items are scored as 0 = never, 1 = sometimes, 2 = often, and 3 = very often. Item scores are summed to generate a symptom severity score for each symptom category.

The CBCL for Ages $1\frac{1}{2}$ to 5 contains 100 behavioral items rated on a 3-point scale: 0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true. Individual item scores are aggregated to form internalizing (e.g., anxiety and depression), externalizing (e.g., ADHD and ODD), and total problem scores as well as seven specific subscales. The CBCL $1\frac{1}{2}$ to 5 is one of the most widely used rating scale screening measures for preschool child psychopathology currently available (Luby et al., 2004).

Finally, a preliminary comparison of the definite psychiatric diagnoses generated through the KSADS-PL and the PAPA was done in 14 children who were referred to the intramural program at NIMH to participate in a study of youth, including preschoolers, at risk for bipolar disorder by virtue of having a parent or sibling with the illness (Brotman et al., 2008). Within an average of 8 months (range 3–15 months) from the time they were evaluated with the KSADS-PL, these subjects were seen at NIMH for assessment with the PAPA by different clinicians from the ones that evaluated the child with the KSADS-PL. Fifty percent were female, 79% Caucasian and had a mean SES of 42.6 ± 17.6 . The PAPA is a structured parent-report interview for the psychiatric assessment of preschoolers. The psychometric properties of the PAPA are comparable to those reported for other structured interviews at other ages (Egger et al., 2006). The PAPA is administered by trained interviewers, coded after the interview. Diagnoses are made with developmentally-appropriate diagnostic algorithms implementing DSM-IV criteria. The primary period of the PAPA is the three months prior to the interview. Lifetime occurrences of traumatic life events and some severe symptoms (e.g., suicidality or fire setting) are exceptions to this time frame.

STATISTICAL ANALYSES

Study outcomes were assessed by standard parametric and non-parametric statistics (e.g., χ^2 , Mann Whitney U). Convergent and divergent validity were evaluated through Spearman's (rho) correlations. Effect size (ES) for independent groups was calculated by Cohens' d. Interrater reliability was assessed using the kappa statistic for $n \ge 2$ raters (Fleiss, 1981). Differences between two correlated correlation coefficients were tested using a modified Fisher z transformation method (Meng et al., 1992).

Spearman (rho) correlations between symptom count and symptom severity scores on the ECI-4 ranged from .65–.90. Since the results using counts and severity yielded similar results, for simplicity only symptom severity scores are reported.

Results are presented as mean \pm standard deviation unless otherwise noted. All p-values are based on two-tailed tests with α =.05.

RESULTS

Definite Lifetime DSM-IV Axis-I Diagnoses

Using the KSADS-PL, 22% (46/204) of the sample had a definite DSM-IV Axis-I diagnosis, with 13% (26/204) having one disorder; 6% (12/204) two disorders, and 4% (8/204) three or more disorders. As shown in Table 1, the most prevalent lifetime definite disorders were Attention Deficit Hyperactivity Disorder (ADHD) (mainly the impulsive/hyperactive type) (9.8%, 20/204), Oppositional Defiant Disorder (ODD) (8.3%, 17/204), any emotional disorders (mood and anxiety disorders (8.8%, 18/204), any elimination disorders (enuresis and encopresis) (5.9%, 12/204), and Separation Anxiety Disorder (SAD) (4.9%, 10/204). Comorbidity was common with subjects with an externalizing disorder (ADHD, ODD or CD),

35% also having an internalizing disorder (anxiety or mood disorders), and 50% of those with an internalizing disorder having an externalizing disorder. The mean age of onset for all disorders was 2.6 ± 1.4 years old.

Convergent and Divergent Validity—We examined correlations between subscales of the CBCL and corresponding DSM-IV diagnoses to look at convergent validity. As shown in Table 2, the largest correlations between lifetime definite diagnoses and CBCL subscales were found in convergent areas: ODD and the aggressive and externalizing subscales (rho=.39 and . 38, respectively, $p \le .001$); ADHD and the attention and externalizing subscales (rho=.42 and . 40, respectively, $p \le .001$); Anxiety and the anxious/depressed and internalizing subscales (rho=.31 and .24, respectively, $p \le .001$). Since only three children were diagnosed with a mood disorder, the low correlations among all subscales were not unexpected. We analyzed divergent validity by testing whether convergent correlations were significantly greater than divergent correlations within diagnoses. Divergent validity results showed that the correlations between any anxiety disorder and anxious/depressed vs. attention and aggressive subscales were significantly different (rho=.31 vs. .06, Z=3.70, p <.001 and rho=.31 vs. .16, Z=2.46, p <.05, respectively).

Discriminant Validity—To determine whether children with definite KSADS diagnoses had significantly higher ECI-4 severity scores than children without KSADS diagnoses, the following disorders were analyzed: ADHD, Anxiety, ODD, Mood, and eliminatory disorders. As shown in Table 3, the results show excellent discriminant validity between diagnoses and the ECI-4 specific subscale for symptom severity scores (all p-values ≤.02).

Inter-Rater Reliability—The Kappas for all KSADS-PL definite DSM diagnoses were between 0.80 and 0.90 (all p-values <.01).

Predictive Validity—Approximately two years after the intake interview, 126 children (62%) have had a follow-up assessment to date (i.e, Time 2). Most (88%) of the interviewers at Time 2 were done by a different interviewer. The mean age of the child at Time 2 was 6.0 \pm 1.5 years old. Seventy-four percent (17/23) of those with a lifetime disorder at intake had a definite current psychiatric disorder at Time 2 compared with 37% (38/103) who did not have a lifetime disorder at intake but had a disorder at Time 2 (χ^2 =10.48, p=.001). Of those children who had a lifetime disorder at intake, about 28% (13/46) had the same types of diagnoses including mood/anxiety and behavioral disorders.

Agreement with the PAPA—Fourteen preschoolers who participated in BIOS were also assessed at the NIMH using the PAPA. The average age at intake/KSADS administration and the NIMH assessment/PAPA administration was 4.2 ± 0.8 years and 4.4 ± 0.7 years, respectively, and the average length of time between assessments was 8.4 ± 4.8 months (range 3–15 months). There were few differences between the PAPA and the KSADS-PL diagnoses. Of the 3 children that were diagnosed with CD through the PAPA, two were diagnosed with ODD through the KSADS and the other had subsyndromal ODD symptoms. One child that was diagnosed with MDD through the PAPA was given a diagnosis of Depression NOS using the KSADS. One child that was diagnosed with social phobia via the KSADS did not have symptoms of social anxiety in the PAPA. Finally, both the KSADS and PAPA indicated that the same 6 of the 14 children assessed (43%) had no diagnosis.

Positive Screen Symptoms

Since preschool children may have subsyndromal symptoms and not full DSM disorders, the ability of the KSADS-PL to detect these symptoms was explored. Forty-percent of the sample had at least one clinically significant symptom in the KSADS-PL screen section with 16%

screening positively for one subsyndromal disorder, 12% for two; 7% for three, and 5% for four or more disorders (Table 1). The most prevalent disorders for which children screened positively were Oppositional Defiant Disorder (ODD), Attention Deficit Hyperactivity Disorder (ADHD), Separation Anxiety Disorder (SAD), and depressive disorders.

Diagnostic comorbidity within the KSADS-PL screening was common with about 50% of those who screened positively for ADDH, ODD, or CD also screening positively for anxiety or mood disorders (and vice-versa).

Convergent and Divergent Validity—As shown in Table 2, analysis of the KSADS-PL positive screens and CBCL T-scores showed good convergence. With the exception of mood disorder, all KSADS-PL positive screens significantly correlated with their corresponding CBCL scale: ADHD and attention, rho=.44; ODD and aggressive, rho=.45; Anxiety and anxious/depressed, rho=.37 (all p-values \leq .001). Additionally, ODD and ADHD were significantly correlated with the externalizing subscale (rho=.41 and .43, respectively, p \leq .001) while Anxiety with the internalizing subscale (rho=.29, p \leq .001). Mood was significantly correlated with the externalizing subscale (rho=.35), but 86% of those who screened for mood disorders also positively screened for a behavior disorder.

Divergent validity was analyzed by testing whether the convergent correlations were significantly greater than divergent correlations. Results were strong for those who positively screened for at least one anxiety symptom. The positive anxiety screen/anxious-depressed subscale correlation was significantly different from both the positive anxiety screen/attention correlation (rho=.37 vs. .05, Z=4.77, p <.001) and the positive anxiety screen/aggressive correlation (rho=.37 vs. .21, Z=2.67, p <.01). Additionally, the positive anxiety screen/internalizing and positive anxiety screen/externalizing correlations were significantly different (rho=.29 vs. .18, Z=2.33, p <.05). Further, the correlations between positive ODD screen/aggressive vs. positive ODD screen/attention were significantly different (rho=.45 vs. .27, Z=3.28, p <.01) as were the correlations between positive emotional screen/anxious-depressed vs. positive emotional screen/attention (rho=.42 vs. .20, Z=3.40, p <.001).

Discriminant Validity—To determine whether children with a positive screen had significantly higher ECI-4 scores than children without a positive screen, the same five disorders that were examined for the KSADS-PL definite diagnoses were analyzed. As shown in Table 3, in all cases children with a positive screen had significantly higher symptom severity scores on the respective ECI-4 subscale (all p-values <.001) as compared to children without a positive screen.

Inter-rater Reliability—The Kappas for all KSADS-PL positive screening symptoms were between 0.70 and 0.86 (all p values <.01).

DISCUSSION

The results of this study replicate and extend the current literature and suggest that the KSADS-PL may be used as a reliable tool for the evaluation of DSM-IV psychiatric disorders in preschoolers. As hypothesized, in general the KSADS-PL showed good psychometric properties for the screening and diagnosis of DSM-IV disorders in this population of children. Moreover, as reviewed by Egger and Angold (2006), the lifetime prevalence of any DSM psychiatric disorders and specific disorders (e.g., anxiety, mood, and behavioral disorders) found in our sample are comparable to the rates reported in non-psychiatric settings.

Before discussing the findings in more detail, the limitations of this study should be considered. First, since part of the sample consisted of children of parents selected for a high risk study

and most of the sample was Caucasian, the generalizability of these findings is limited. However, as noted above, the rates of psychiatric disorders ascertained through the KSADS were comparable to those of other studies in the field (Egger & Angold, 2006; Gadow et al., 2001; Keenan et al., 1997; Lavigne et al., 1996; Roberts et al., 1998). Second, the relatively small number of children with certain definite lifetime DSM diagnoses (e.g., mood disorders) limited the range of disorders that were analyzed. Thus, there is a need to evaluate the usefulness of the KSADS for preschoolers using larger community and clinically-referred samples. Third, no direct observational data was available. Also, since a small proportion of children attended kindergarten or other preschool services, we did not obtain information from teachers or other non-family sources. Fourth, since it is very difficult to administer the KSADS and the PAPA because both interviews are lengthy, the comparison between the KSADS and the PAPA was based on a small sample of cases. Furthermore, the KSADS and PAPA were administered on separate occasions that were an average of 8 months apart. The primary period of the PAPA is the last 3 months, whereas the KSADS assessed lifetime occurrence. However, despite these issues the rate of agreement between the two instruments was good. Finally, pervasive developmental disorders were not included because the KSADS-PL does not include these conditions.

For definite DSM-IV lifetime psychiatric disorders, the K-SADS showed good overall convergent and discriminant validity and good inter-rater reliability. Divergent validity was strong for anxiety disorders. Discriminant validity was excellent. In fact, preschool children who were diagnosed with ODD, ADHD, ANX, MOOD, or ELIM had significantly higher scores than preschoolers without these disorders on the ECI-4. Inter-rater kappa coefficients for all definite diagnoses were high. Also, though preliminary, a preschooler's intake diagnosis appears to be predictive of a current diagnosis at two-year follow-up assessment.

In the same manner, results were very similar when looking at the positive KSADS screens. With the exception of MOOD, all convergent CBCL correlations were significant. As previously noted, 86% of those who screened positive for a mood disorder screened positive for a behavioral disorder—which explains the highest correlations found between any positive mood screen and the aggressive and externalizing subscales. As with the definite disorders, divergent validity results were strongest for anxiety disorder positive screens. Additionally, ODD and emotional positive screens showed good divergent validity and statistically separated from the attention domain. Discriminant validity was significant for all positive screens. Interrater reliability of the KSADS-PL was very good (Kappas for all individual positive screens and for positive screens overall were \geq .70).

Despite the fact that children were interviewed with the PAPA an average of 8 months after the KSADS administration and methodological differences between these two instruments, the results obtained with both instruments were comparable. These results are not surprising because, with some exception, both instruments share similar content. The few discrepancies suggest that the differences between the PAPA and the KSADS may reflect different degrees of severity rather than a global disconnect. Also, other factors may account by the differences between these two instruments such as time effects, inherent differences between semi-structured and structured instruments, and the fact that diagnoses of the PAPA are generated by a computer algorithm whereas the final diagnoses of the KSADS are generated by a clinical consensus with a child psychiatrist. However, given the very small numbers, the observed differences may be accounted for by error indicating the need for further studies with larger samples.

The detection of emerging psychiatric symptomatology in preschoolers is extremely important in that it helps to define the earliest manifestations and boundaries of phenotypes, provides an opportunity for early intervention, and may reduce the risk and severity of later disorders

(DelCarmen-Wiggins & Carter, 2001; Egger & Angold, 2004; Luby et al., 2004b). Though much work remains in examining the appropriateness of DSM-IV diagnostic criteria for this age group (Egger & Angold, 2006; Luby et al., 2003; Sprafkin et al., 2002), including assessing psychopathology in the context of normal preschool developmental stages (Carter et al., 2004; Gadow & Sprafkin, 2000; Keenan & Wakschlag, 2002), temperamental variation (Egger & Angold, 2006), and the delineation between typical and atypical behaviors in an age group marked by rapid developmental changes, results of this pilot and other studies suggest that the KSADS may be useful to screen and diagnose preschool children through parent interviews. The KSADS-PL may be considered for studies that assess children from ages 2 to 18 years, and in particular those that study clinical samples. While the parent remains the sole reporter for children under age 6, once children reach 6 years old, they—along with their parents—can be directly interviewed about their psychiatric symptomatology, using the same instrument. However, it is important to emphasize that given the limitations noted above, the results of this study need to be considered preliminary and further evaluation of the usefulness of the KSADS-PL, the K-MRS and DEP section of the KSADS-P for preschoolers is warranted. Furthermore, some of the prompts of the KSADS may require further modification for easy administration for this age group. Finally, it is crucial to train others to make empirically determined "developmentally appropriate" decisions in coding the KSADS.

Future studies need to take into the account any changes in the validity of DSM-IV criteria for preschoolers (Carter et al., 2004; Keenan and Wakschlag, 2004; Luby et al., 2003; Scheeringa et al, 2001). Also, studies should compare whether diagnoses in preschoolers generated through computer algorithms are comparable to diagnoses generated though clinical consensus. In addition, multiple sources of information such as teachers and other family members, psychiatric family history and other familial factors, life events, parent-child interaction observation, are needed in order to provide a comprehensive assessment as well as to uncover possible predictors and clinical correlates (Carter et al., 2004).

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 $\begin{tabular}{l} \textbf{Table 1}\\ KSADS-PL\ Lifetime\ Positive\ Screens\ ^* and\ Lifetime\ Definite\ DSM-IV\ Diagnoses\ (n=204)\\ \end{tabular}$

		*	Ī	
	Positive	e Screen T	Lifetime Defi	nite Diagnoses
	N	%	N	%
Any Disorder	81	39.7	39	18.7
Any Mood Disorder	22	10.8	3	1.5
Depressive Disorders	14	6.9	1	0.5
Manic Disorders	12	5.9	2	1.0
Any Anxiety Disorder	32	15.7	16	7.8
Separation Anxiety Disorder (SAD)	25	12.3	10	4.9
Generalized Anxiety Disorder (GAD)	3	1.5	2	1.0
Specific Phobia	9	4.4	3	1.5
Social Phobia	6	2.9	3	1.5
Post Traumatic Stress Disorder (PTSD)	10	4.9	0	0
Anxiety Disorder NOS			3	1.5
Any Emotional Disorder (Anxiety and Mood disorders)	48	23.5	18	8.8
Adjustment Disorder w/Depressed Mood			1	0.5
Adjustment Disorder w/Anxious Mood			1	0.5
Any Elimination	18	8.8	12	5.9
Enuresis	14	6.9	7	3.4
Encopresis	6	2.9	6	2.9
Any Behavioral Disorder (ADHD, ODD, CD)	49	24.0	26	12.7
Attention Deficit Hyperactivity Disorder (ADHD)	31	15.2	20	9.8
ADHD-Inattentive			2	1.0
ADHD-Impulsive/Hyperactive			12	5.9
ADHD-Combined			6	2.9
Oppositional Defiant Disorder (ODD)	36	17.6	17	8.3
Conduct Disorder (CD)	5	2.5	1	0.5
Psychosis	1	0.5		

^{*} At least one positive key KSADS-PL symptom. Shaded area indicates KSADS-PL does not produce a Positive Screen for this specific area; NOS=Not Otherwise Specified.

KSADS-PL Lifetime Definite DSM-IV Diagnosis and Lifetime Positive Screen^a Correlations with CBCL-1½-5 T-scores

CBCL	Emotionally Reactive	Anxious/ Depressed	Somatic	Withdrawn/ Depressed	Sleep Problems	Attention	Aggressive	Internalizing	Externalizing	Total Problem
Diagnoses										
ADHD	,40 [†]	.32†	.32 [†]	$.36^{\dagger}$.21	,42 [†]	.39†	[†] 04.	,40 [†]	.41
Anxiety Disorders	*15	.31	.20*	80.	.13*	90°	.16*	.24	*21.	.20*
Mood Disorders	*61.	.20*	.17*	.17*	.15*	*02.	*61.	*61.	_* 61'	*61.
Emotional Disorders	*61.	.34	.23 [†]	.12*	.16*	.12*	.22†	,28 [†]	*07.	.24 [†]
ODD	.37	.32†	.13*	.22 [†]	.20*	.31	.39†	.32	,38 [†]	.36 [†]
Screens										
ADHD	.37	.31	.34	.40 [†]	.25†	,44 [†]	.41	,42 [†]	,43 [†]	.44
Anxiety	*61.	.37†	$.26^{\dagger}$.10	.16*	50.	.21	,29 [†]	*81.	.24 [†]
Mood disorders	.31	.27	.17*	.22 [†]	.27†	,29 [†]	.36†	[‡] 67.	,32 [†]	.34†
Emotional disorders	.31	.42	.28 [†]	.20*	.28	.20*	.38	±22°	.34	.37 [‡]
ODD	.37 [†]	.37	,23 [†]	.27	.27	,27 [†]	.45 [†]	⁷ 8£.	,41 [†]	.40 [†]

^ At least one positive key KSADS-PL symptom; Note: Shaded cells indicate cells measuring convergent validity; ADHD=attention-deficit/hyperactivity disorder; CBCL= Child Behavior Checklist; Emotional disorders= mood plus anxiety disorders; ODD=oppositional definant disorder

 $p \le .05$;

 $^{\not \tau}_{p \le .001}$

Table 3ECI-4 Severity Scores in Preschoolers With and Without KSADS-PL Definite Diagnoses and KSADS-PL-Positive Screens*

Mean (SD) of ECI-4 Subscales	KSADS-PL Lifetime Definite Diagnosis Positive	KSADS-PL Lifetime Definite Diagnosis Negative	p-value	Effect Size
ADHD	36.6 (10.4)	15.1 (9.3)	<.001	2.18
Anxiety disorders	23.2 (14.5)	13.8 (8.3)	.001	0.80
ODD	17.2 (6.7)	6.4 (4.8)	<.001	1.85
Mood disorders	12.7 (6.7)	5.1 (3.3)	.009	1.44
Elimination disorders	2.4 (1.0)	0.9 (1.3)	<.001	1.29
	KSADS-PL Lifetime Screen Positive	KSADS-PL Lifetime Screen Negative		
ADHD	32.3 (11.7)	14.5 (9.0)	<.001	1.71
Anxiety disorders	30.4 (14.2)	20.7 (8.9)	<.001	0.82
ODD	14.4 (6.7)	5.8 (4.3)	<.001	1.53
Mood disorders	8.0 (4.8)	4.9 (3.1)	<.001	0.77
Elimination disorders	2.4 (1.5)	0.7 (1.1)	<.001	1.29

All comparisons were examined by the Mann Whitney U test

ADHD= Attention Deficit Hyperactivity Disorder; ECI-4= Early Childhood Inventory-4; ODD=Oppositional Defiant Disorder; SD=Standard Deviation

^{*}At least one positive key KSADS-PL symptom for disorder