Preschoolers' Contribution to their Diagnosis of Depression and Anxiety: Uses and Limitations of Young Child Self-Report of Symptoms

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Abstract

Background The assessment of psychopathology in preschool aged children has traditionally relied exclusively on adult informants as children under 6 years-of-age have been widely regarded as developmentally unable to serve as valid reporters of their own mental state. Based on the finding of a valid preschool depressive syndrome, methods to obtain self-report of symptoms of depression and related anxiety directly from the child are now needed.

Methods The Berkeley Puppet Interview (BPI), a novel measure of psychopathology designed for the young child informant, was administered to $N = 110$ preschool study subjects aged 4.0–5.6 who participated in a comprehensive assessment of preschool depression. Parents filled out the Child Behavioral Checklists (CBCL) and the diagnosis was derived using parent report on the Diagnostic Interview Schedule for children, version IV (DISC-IV-YC) at baseline and 6 months later.

Results Findings suggest that young children may serve as useful reporters of several core and basic symptoms of depression and anxiety based on significant correlations with a variety of parent report measures administered concurrently and 6 months later. However, no significant correlations were found between preschool reports of more complex or abstract symptoms.

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Conclusion These findings taken together suggest that the young child can validly self-report on some key aspects of depression and anxiety and that self-report of young children should be sought in these domains. Findings also suggested that these self-reports are limited to the core and basic symptoms of these disorders and that direct age appropriate approaches may not be useful beyond that domain.

Keywords Preschool depression · Child self-report · Childhood mood disorder

Introduction

Traditionally, the assessment of psychopathology in preschool-age children has relied exclusively on adult informants as children under 6 years-of-age have been widely regarded as developmentally unable to serve as valid reporters of their own mental state [1, 2]. In the area of mood disorders, the sole reliance on the reports of adult caregivers may be particularly problematic as these informants may fail to recognize the symptoms of depression in young children [3, 4]. Accordingly, investigations of early onset depressive disorders are one area in which young child informants might add meaningful information if age appropriate methods could be developed to reliably access them. Data establishing the basic validity of depressive disorders arising during the preschool period has recently become available underscoring the need for further investigation of this syndrome and the necessary tools to access the related internal emotional states of the young child [5–7].

The Importance of the Child Informant to the Assessment of Psychopathology

The finding that the manifestation of symptoms during early childhood is in general highly variable across context further underscores the need to access the child informant to provide an additional perspective [8, 9]. Along these lines Kraemer et al. [10] have emphasized the value of obtaining data from multiple informants and then combining all informants' observations from different contexts, such as home and school. This multi-faceted view is most optimal when it includes reports from parents, teachers, and the child themselves. Inconsistencies among reports from different informants are a salient, expected phenomenon in the assessment of psychiatric symptoms in children and may be based at least in part on this contextual variability [11]. Very low levels of agreement between different kinds of informants across contexts have been observed when assessing inter-nalizing symptoms in children [1, 10, 12]. In order to understand the meaning of these discrepancies, it is necessary to investigate the validity of developmentally appropriate tools to assess internalizing symptoms from the young child informant.

Test–Retest Reliability of Child Reports and Correlations with Adult Reports

Data on the reliability and validity of child self-report of psychiatric symptoms suggest that the young child's ability to accurately self-report on symptom states varies by disorder [12]. Several independent investigations encompassing a broad age range of children and adolescents have reported low but significant correlations between child self-report of

internalizing symptoms and parent or teacher rated impairment and clinical diagnoses [1, 12]. In contrast, child self-reports of externalizing symptoms did not consistently demonstrate significant correlations. Hart et al. [13] found that self-reports of symptoms of ODD and CD among children ages 7–12 were not significantly correlated with those of parents, but were related to teachers' reports. This is not surprising given that oppositional and conduct-disordered youth's self-perceptions are rarely in sync with parental perceptions as this is a core feature of these disorders. In the same sample, there were no significant correlations found between informants for ADHD. Jensen et al. [11] found that for older children and adolescents ages 9–17, reports between child and parent were not significantly correlated, but that reports (from both parents and children) of internalizing symptoms such as depression and anxiety were significantly correlated with both impairment and clinical diagnoses. The correlation between child and parent report of anxiety is not surprising since symptoms of anxiety in children when even moderately severe make themselves quite evident to caregivers. Notably, in the same study, no significant relationship was found between child-reported and parent-reported externalizing disorders such as ADHD and ODD.

A meta-analysis of 250 studies of children and adolescents that used reports from a variety of informants (teacher, parent, child and other) to investigate the strength of correlations showed that children's self-reports and the reports of adult caregivers in general showed lower correlations lower for externalizing than internalizing problems [1]. These findings taken together suggest that child reporters have the potential to make a unique and important contribution to the identification of internalizing disorders such as depressive and anxiety disorders even though they may be less capable of reliable reports about externalizing psychiatric symptoms.

Methods for Assessing the Young Child Informant

Focusing on young children, Ablow [14] used a novel age appropriate puppet based child report (described in detail below) and found that the self-reports of very young children ages 4–8 accurately discriminated between community and clinic-referred children for both internalizing and externalizing disorders. The same young children's self-reports were also moderately correlated to those of teachers and parents on a companion measure. Other studies have also provided evidence supporting the validity of the young child informant when developmentally appropriate measures were utilized. Ialongo et al. [15] assessed first-graders' self-reports of anxiety using the Revised Children's Manifest Anxiety Scale (RCMAS) [16] and found that symptom reports were stable over a 4-month period. In addition, young children's self-reports of anxiety were significantly related to achievement problems, a valid and objective independent measure of functioning. Perhaps most notably, Ialongo et al. [17] found that children's self-reported depressive symptoms as assessed by the Children's Depression Inventory (CDI) [18] in the first grade were significantly more predictive of later outcomes such as suicidal ideation, depression, and academic achievement than adult reports. These findings strongly support the need to assess depressive symptoms directly from the child and further suggests that the young child may have the ability to report features of unique predictive importance that are not captured by adult reporters.

A variety of methods have been developed to assess self-reports of symptom states from young children. Valla and colleagues [19, 20] developed the ''Dominic Interactive'' interview, a computer-based interactive cartoon that depicts a child expressing specific

emotions appropriate to situations and contexts that are associated with that emotional state. The Dominic Interactive, designed for children ages 6–12, has been shown to successfully discriminate between groups with and without clinical diagnoses [20]. Ialongo et al. [17] modified Kovacs' Children's Depression Inventory (CDI) [18] described above which was designed for administration to young children in a group setting. Questions were read aloud to a group of young children to avoid limitations in reading comprehension and to access larger groups of young children for population based studies. A common element is that this interview also required children to select (one of three) sentences that most closely described their own feelings.

The Berkeley Puppet Interview (BPI) [14] is a novel measure of psychopathology designed for the young child informant ages 4.6–7.5 that has become widely used in developmental research [2, 21–23]. The BPI is a puppet interview designed to assess young children's self-perceptions in multiple domains including academic, social and emotional, as well as children's representations of family environment and parent–child relationships [23]. The BPI-Symptom scales (BPI-S) assesses emotions and behaviors that are manifestations of symptoms of numerous DSM-IV Axis Z disorders arising in early childhood. The interview involves young children engaging with two identical hand puppets who make divergent but neutral statements such as ''I'm a happy kid/I'm not a happy kid.'' They are then asked to indicate which puppet more closely expresses how they feel. Coding of responses is done by viewing a videotape of the child's responses at a later point using a seven-point (1–7) scale that takes into account vocal tone and body language. Negative responses (''I'm not a happy kid'') are given a score of '1,' '2,' or '3' depending upon their degree of negativity. In a similar manner, positive responses (''I'm a happy kid'') are given a score of '5' '6' or '7'. A score of '4' is given if the child responds that both items are accurate descriptions. Measelle et al. [23] investigated the reliability and validity of the BPI-Self Perception Scales. Internal consistency for the depression-anxiety scale exceeded .70 for children in preschool, kindergarten and first-grade. Results over a one-year period suggested that children's responses on the depression-anxiety scale were relatively stable ($r = .58$) from kindergarten to first grade. Young children's reported depression-anxiety on the BPI was also significantly correlated with parents' and teachers' ratings of depression-anxiety symptoms.

Reporting on results from a multi-site study, Ablow et al. [12] found that in several diagnostic categories including depression and anxiety, young children's self-reports on the BPI was significantly associated with clinic-referred and non-referred group status along the expected lines. Findings from this study also established good test–retest reliability of young children's self-reports (alpha coefficient of .60). Although higher than in previous research, children's responses on the depression subscale demonstrated the lowest test–retest reliability of the internalizing subscales [12]. Finally, although not statistically significant, authors reported a trend for the test–retest reliability of clinically referred children's self-reports of depressive symptoms to exceed test–retest reliability of reports from non-referred children. This could suggest that clinically referred children who experience more symptoms, may have a greater capacity to reliably report on these symptoms. Based on these suggestive findings, further investigation of the BPI depression scale was deemed warranted to determine if it could be used as a reliable and valid assessment for symptoms of clinical depression in young children.

In addition to these forms of direct self-report in young children, other more interpretive methods of accessing the internal state of the young child have also been developed. These include narrative techniques such as the MacArthur Story Stem Battery (MSSB) and other forms of semi-structured play interviews [24–27]. The MSSB is a narrative technique

designed for children aged 3–7 that has been adapted for use in clinical populations which has been shown to be related to both internalizing and externalizing forms of psychopathology [28, 29]. A set of story stems is presented to the child who is asked to complete the story, beginning at the height of an unresolved problem or conflict. Characteristics of an individual child's completion of the narrative has been shown to be indicative of a child's representations of interpersonal conflict, empathy, aggression, and moral values [30]. Responses on narratives have been previously shown to be related to clinical status [31]. These tools, although very rich and pertinent to psychopathological process, do not address the issue of the presence or absence of symptoms. In addition despite their value, their greater complexity makes them less feasible for use in diagnostic studies given the need for observational methods and standardized coding of videotapes.

Study Aims and Hypotheses

For this investigation, part of a larger study on the nosology of MDD in preschool children, we sought to investigate the validity of the BPI as a preschool self-report measure of depressive and anxious symptoms and to compare it to the report of parent informants. The current study also sought to examine the predictive validity of preschoolers' report of depressive and anxious symptoms on the BPI over a 6-month period. The primary hypothesis of this investigation was that depressed preschoolers would endorse more depression and anxiety items at greater intensity on the BPI (resulting in a higher depression and anxiety ''average'' scores) than psychiatric and no disorder comparison groups. It was also hypothesized that preschoolers' reports of depressive and anxious symptoms would predict parent reports of depressive symptoms 6 months later. If the validity of BPI items could be established, it would serve to guide the appropriate use of the young child self-report of depressive and anxious symptoms as a component of a comprehensive assessment of depression in young children.

Method

Study Population

One hundred seventy-four children between the ages of 3.0 and 5.6 years were assessed in the Early Emotional Development Program (EEDP) at the Washington University School of Medicine (WUSM) as part of a larger study on the nosology of preschool depression. Children were recruited from primary care settings using a validated checklist designed for the identification of depression and early onset behavior problems (PFC) [32] as well as consecutive case ascertainment from a preschool mental health clinic [33].

Three groups of children were sought for participation in the study based on their checklist scores and a subsequent telephone interview conducted by a trained research assistant: (1) children who met DSM-IV symptom criteria for MDD; (2) children who met all DSM-IV criteria for ADHD and/or ODD; and (3) ''healthy'' children who did not meet criteria for any DSM-IV psychiatric disorder. Children's diagnostic status was determined by mothers' reports on a structured diagnostic interview, The Diagnostic Interview Schedule for Children-Version IV-Young Child (DISC-IV-YC) [34]. Children with chronic medical illnesses, neurological problems, and those with pervasive developmental disorders and/or language or cognitive delays that would prohibit their comprehension of the study questions were

excluded. In addition, because the BPI has yet to be validated in children under 4 years-of-age, only children who were 4 years-of-age and older at Time 1 were included in the following analyses. In addition to using this age cutoff the current study only included preschoolers who participated at both time 1 and time 2 ($n = 17$ of those 4 and older dropped out). No significant differences were found between participants who completed both time points and those who dropped out on several core variables. Thus, current analyses included 110 preschoolers ($n = 47$ boys, $n = 63$ girls; age $M = 4.51$) between 4 and 5.6 years of age who met all criteria for inclusion and fell into one of the three diagnostic categories described above and who participated in both baseline and follow-up assessments (see Table 1).

Demographics

Demographic characteristics of the sample in relation to preschoolers' self-reported BPI depression average scores were examined (see Table 1). Analyses revealed that mothers

Table 1 Demographics

	No disorder (%) ($n = 41$)	MDD (%) ($n = 44$)	ADHD/ODD (%) ($n = 25$)
Gender			
Male	37 (15)	41 (18)	56 (14)
Female	63 (26)	59 (26)	44 (11)
Age in Years			
4	54 (22)	43 (19)	52 (13)
5	46 (19)	57 (25)	48 (12)
Ethnicity			
White	78 (32)	84 (37)	88 (22)
Black	12 (5)	7 (3)	4 (1)
Hispanic	2 (1)	2 (1)	4 (1)
Mixed	5 (2)	5 (2)	4 (1)
Other	2 (1)	2 (1)	4 (1)
Education			
H.S. Diploma	2 (1)	7 (3)	8 (2)
Some College	24 (10)	39 (17)	40 (10)
4-year Degree	37 (15)	32 (14)	24 (6)
> 4-years college	12 (5)	7 (3)	8 (2)
Prof Degree	22 (9)	9 (4)	20 (5)
Marital Status			
Married	85 (35)	75 (33)	84 (21)
Seperated	2 (1)	5 (2)	0
Divorced	7 (3)	9 (4)	8 (2)
Never Married	2 (1)	9 (4)	8 (2)
Income			
$0–$29,999	10 (4)	22 (10)	12 (3)
$30,000–$59,999	29 (12)	38 (17)	32 (8)
> $60,000	60 (25)	40 (18)	56 (14)

who reported an annual household income lower than $60,000 had preschoolers who had significantly higher ($p < .01$) BPI depression average scores ($M = 3.44$, $SD = 1.27$) than those preschoolers whose mothers' reported an annual income greater than $60,000 (BPI scores $M = 2.77$, $SD = 1.04$). Results indicated that preschoolers' self-reported BPI depression average scores did not differ based on age, gender, or ethnicity of the child. No differences were found between diagnostic groups in language skills as measured by the Clinical Evaluation of Language Fundamentals (CELF) [35].

Measures

Berkeley Puppet Interview-Symptom States (BPI-S). Depression Module

Preschoolers' self-reported depression and anxiety symptoms were measured using the BPI-S. The BPI consisted of 25 items with 7 that assessed symptoms of depression and 18 that assessed symptoms of anxiety using the methods described above. Raters were certified in administration and coding of the BPI first by undergoing a 3-day training by one of the measures authors and subsequently completing training tapes and achieving inter-rater reliability. In addition raters administration techniques were videotaped and viewed by the measures developers who provided feedback.

As a part of the BPI administration protocol, all interviews were videotaped and children's responses were rated using a 1- to 7-point Likert scale. Research assistants responsible for coding were trained and certified as described above, and remained blind to children's diagnostic status. Very positively endorsed (e.g., I'm a really happy kid) items received a score of 7 and items that were very negatively endorsed (e.g., I'm never a happy kid) received a score of 1. All tapes were double coded to test for and assure reliability and any discrepancies found were resolved by discussion and mutual agreement.

The Diagnostic Interview Schedule for Children-Version IV-Young Child (DISC-IV-YC)

The DISC-IV-YC is a structured diagnostic interview, which was administered to mothers in order to determine their preschoolers' diagnostic status. The DISC-IV-YC [34] is a version of the well-validated DISC-IV [36] modified for young children in age applicable modules to account for the developmental manifestations of symptom states [6]. For all disorders investigated, all formal DSM-IV diagnostic criteria were applied, with the exception of the duration criteria for MDD, which were not included due to the ambiguity of the durational features related to this age group [5]. Based on diagnostic status according to parent report on the DISC-IV-YC, children were assigned to one of three study groups: (1) depressed group (MDD) consisting of those who met DSM-IV symptom criteria for major depressive disorder (regardless of their co-morbidity for other disorders) (total group $n = 18$ boys, $n = 26$ girls); (2) ADHD/ODD comparison group consisted of children who met all DSM-IV ADHD and/or ODD criteria, but did not meet criteria for any affective disorder ($n = 14$ boys, $n = 11$ girls); and (3) the ''no disorder'' comparison group consisted of children who did not meet criteria for any psychiatric disorder ($n = 15$ boys, $n = 26$ girls). Seventy percent of the MDD group also had a co-morbid diagnosis of ADHD and/or ODD.

In addition to organizing preschoolers by DSM-IV categorical diagnostic group (i.e., depressed, disruptive and healthy groups), dimensional depression severity sum scores derived from the DISC-IV-YC were also of interest. Depression severity sum scores were

created at Time 1 and Time 2 by adding together the 19 core DSM-IV symptoms (see Table 2) of depression (not including duration items) from the MDD module of the DISC-IV-YC. Previous research has established significant correlations between preschoolers' depression severity sum scores and diagnostic group status as well as maternal supportive strategies and preschoolers' behaviors during mildly stressful parent–child interactions [6, 37].

Child Behavior Checklist

Primary caregivers filled out the 4- to 18-year-old version of the Child Behavior Checklist (CBCL/TRF) [38] at baseline and at follow-up to obtain internalizing and externalizing T-scores at both time points. This version of the scale was used since children receiving the BPI were 4 and older and because the 1- to 5-year-old version of the CBCL was not available at the time the study was initiated.

Numerous additional observational and developmental measures were also administered including the Clinical Evaluation of Language Fundamentals [35] to assure that differences in BPI responses did not arise as a function of differences in language skills.

Procedure

During two separate visits (baseline-Time 1 and 6-months later-Time 2) to the WUSM EEDP preschoolers underwent a comprehensive 2- to 3-h developmental and mental health assessment during which time the BPI was administered by a trained and certified child interviewer. The BPI was conducted as part of a more comprehensive assessment battery and was administered approximately 1 h after the assessment began, by which time the interviewer had established a rapport with the child. Interviewers then provided

Table 2 Correlation between DISC depression severity and BPI depression and anxiety items

	1. Depression severity
Depression Items	
1. I cry a lot	.21*
2. I am a sad kid	.26**
3. I am a happy kid (0 = happy; 7 = not happy)	.27**
4. I think I am stupid	−.08
5. I don't like myself	−.02
6. I am a lonely kid	.01
7. I am tired a lot	.12
Anxiety Items	
8. Hard to say goodbye to parents	.19*
9. Has a lot of bad dreams	.22*
10. Nervous and shy to ask other kids to play	.20*

$*p < .05$; $**p < .01$

Note: High scores indicate emotionally negative responses (e.g., 1 = I am a happy kid; 7 = I am not a happy kid)

instructions for the task using a standardized script designed by the authors of the measure [23]. Once an understanding of the task was established, based on practice questions, the 25 BPI-S items (i.e., 7 depression items and 18 anxiety items) were administered. During the Time 1 and Time 2 child assessments, mothers were in a separate room being interviewed about their children's developmental functioning and symptom states (DISC-IV-YC).

Composite Variables and Data Analyses

Depression Variables and Analyses

In the first analysis, Spearman Rho correlation coefficients were examined to determine which of the seven BPI depression items were associated with preschoolers' Time 1 parent rated depression severity scores (see Table 2). Three BPI depression items were (i.e., I am a sad kid, I cry a lot, and I am not a happy kid) significantly correlated ($p < .05$) with parent-reported depression severity scores. These three variables, which addressed basic core depressive symptoms, were then used to create a *mean* BPI ''basic core'' depression severity score at Time 1 and at Time 2. The four remaining BPI depression items (addressing both sides of: I think I am stupid, I don't like myself, I am a lonely kid, and I am tired a lot) that were not correlated with parent rated depression severity were considered to address more indirect, abstract or emotionally complex symptoms were used to create a second *mean* BPI ''complex'' depression score, to be further examined for comparison in a parallel fashion.

Univariate Analyses of Variance tests (ANOVAs) were conducted to examine whether BPI depression scores (i.e., ''basic core'' and ''complex'' depression mean scores) differed significantly in relation to parent rated preschoolers' DSM-IV categorical diagnostic group status at Time 1. Correlation analyses were conducted to determine whether preschoolers' BPI depression severity scores at Time 1 were correlated to parent reported depression severity scores at time 2 and CBCL internalizing and externalizing T-scores at Time 1 and at Time 2.

Follow-up analyses were also conducted to examine how well parents' reports on comparable CBCL items, thought to match the child-reported BPI depressive items, differentiated diagnostic groups. This comparison was designed to serve as more direct test of the informant as the nature of the questions between the two measures (CBCL and BPI) were more comparable. Two of the three items (i.e., cries and sad) used to create the mean BPI depression scores matched items measured in the CBCL. Thus, parents' responses on the ''cries'' and ''sad'' items were averaged together to create a comparable CBCL ''basic core'' depression mean score.

Anxiety Variables and Analyses

Spearman Rho correlation coefficients were again examined to determine which of the 18 BPI anxiety items were most strongly associated with preschoolers' Time 1 parent rated depression severity scores. Of the 18 total anxiety items administered, only three items (i.e., bad dreams, shy, and hard to say goodbye to parents) were significantly correlated to parent reported depression severity scores at time 1 (see Table 2). Thus, these three items were averaged together to create child-report BPI anxiety mean score.

Two of the three BPI items used to create the child-reported mean anxiety scores were also assessed by the CBCL (i.e., bad dreams and shyness). Identical to the comparable CBCL depression variable described above, parents' responses to the ''bad dreams'' and ''shyness'' items were averaged together to create CBCL mean anxiety scores. Univariate analyses were then conducted to examine how well child versus parent-report of anxiety symptoms differentiated children's diagnostic classifications.

Results

Construct Validity of Preschoolers BPI Self-Reported Depression

A one-way analysis of variance was conducted to evaluate whether preschoolers' Time 1 self-reported BPI ''basic core'' depression scores differed significantly based on their categorical diagnostic group classification (i.e., MDD, ADHD/ODD, or no disorder) at Time 1. The ANOVA was significant, $F(2, 105) = 3.43$, $p = .04$. Using the Tukey HSD approach to control for type I error, post hoc comparisons revealed that preschoolers' in the MDD group ($M = 3.43$, $SD = 1.19$) had significantly ($p < .03$) higher BPI ''basic core'' depression scores than the no disorder group ($M = 2.76$, $SD = 1.15$). Although the MDD group had higher self-reported BPI ''basic core'' depression scores than *preschoolers* in the ADHD group ($M = 3.06$, $SD = 1.17$) these differences were not statistically significant. Results indicated no significant differences between diagnostic groups in relation to children's BPI ''complex'' depression mean score.

Concurrent and Predictive Validity of Preschoolers' Self-Reported Depression

Spearman Rho correlation coefficients were used to examine whether preschoolers' BPI ''basic core'' depression mean scores at Time 1 were associated with their Time 1 and/or Time 2 DISC-IV-YC dimensional depression sum scores. Results indicated that pre-schoolers' BPI ''basic core'' depression scores at Time 1 were associated with Time 1 caregiver-reported DISC-IV-YC depression sum scores, $r_s = 33$; $p = .001$. Preschoolers' BPI ''basic core'' depression average scores at Time 1 was also significantly associated with DISC-IV-YC depression sum scores 6 months later at Time 2, $r_s = .26$; $p = .02$. Preschoolers' BPI ''complex'' mean depression scores were not associated with Time 1 or Time 2 parent-report depression scores.

Discriminant Validity

Spearman Rho correlations were used to examine whether preschoolers' BPI depression scores at Time 1 were associated with their CBCL internalizing and externalizing T-scores at Time 1 and at Time 2. Results indicated that preschoolers' Time 1 BPI basic core depression scores were significantly related to Time 1 CBCL internalizing T-scores, $r_s = .28$; $p = .004$ as well as CBCL internalizing T-scores at Time 2, $r_s = .31$; $p = .005$.

Because high levels of co-morbid ADHD/ODD were found among the depressed group (approximately 70% of depressed preschoolers in the sub-sample included in these analyses were also ADHD and or ODD) for the second set of analyses that examined Time 1 and Time 2 CBCL externalizing T-scores, the effects of ADHD and ODD severity were

controlled for using multiple regression. That is, regressions analyses were used to examine whether preschooler BPI depression mean scores predicted CBCL externalizing scores at Time 1 and Time 2 after controlling for the effects of preschoolers' ADHD and ODD severity scores. Results indicated that after controlling for the variation accounted for by preschoolers' ADHD and ODD severity scores, preschoolers' Time 1 BPI ''core basic'' depression severity scores did not account for a significant ($p > .05$) portion of the variance in preschoolers' Time 1 or Time 2 CBCL externalizing T-scores.

Comparing ''Matched'' BPI and CBCL Depression Mean Scores

As previously described comparable CBCL ''core basic'' depression mean z-scores were created by extrapolating 2 items from the CBCL, which matched two of the three items used to create the BPI ''core basic'' depression mean score. Using an ANOVA with Tukey HSD post hoc tests results indicated that preschoolers in the MDD group had significantly, ($F(2,100) = 35.34$, $p < .001$) higher CBCL ''core basic'' depression mean z-scores than children in the ADHD and healthy groups. The same analysis was conducted again but using BPI depression mean z-scores as the outcome variable. Results indicated a significant main effect of preschoolers diagnostic group status on their mean BPI depression z-scores, $F(2,107) = 3.35$, $p < .05$. Post hoc comparisons indicated that depressed preschoolers had significantly higher mean BPI depression z-scores than children in the healthy group but were no different from children in the disruptive group. Figure 1 provides an illustration of preschoolers' z-scores on the modified BPI and CBCL depressive subscales in relation to diagnostic group membership.
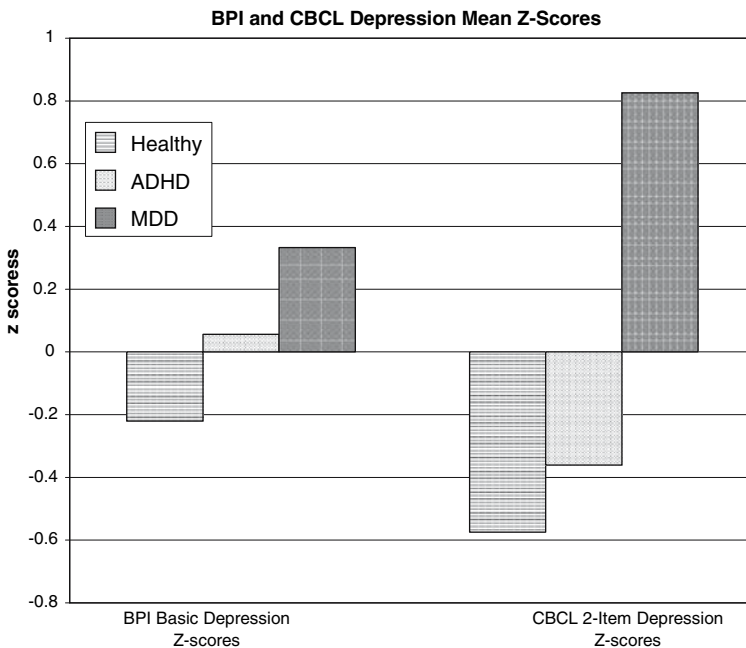

Fig. 1 BPI and CBCL mean scores were transformed to z-score to provide a standardized depiction of their distribution in relation to each other

BPI Anxiety Variables Related to Preschoolers' Depression

Additional analyses were conducted to examine whether the anxiety items on the BPI were correlated with preschoolers' depression severity based on parent-report using the DISC-YC-IV. Using the previously described strategy, the three BPI anxiety items (1. bad dreams; 2. being too shy to play with peers; 3. missing parents while at school) correlated with parent-reported depression severity at Time 1 (see Table 2) were averaged together to create a the BPI anxiety mean scores.

A one-way analysis of variance was conducted to evaluate whether preschoolers' Time 1 self-reported BPI anxiety mean scores differed significantly in relation to parent reported DSM-IV categorical diagnostic group classification (i.e., MDD, ADHD/ODD, or no disorder) at Time 1. The ANOVA was significant, F (2, 102) = 6.84, p = .002. Using the Tukey HSD approach to control for type I error, post hoc comparisons revealed that preschoolers' in the MDD (M = 3.78, SD = 1.37) and ADHD (M = 3.83, SD = 1.08) groups had significantly (p < .01) higher BPI anxiety scores than the no disorder group (M = 2.92, SD = .98). There were no differences between the MDD and ADHD group.

Preschoolers' BPI anxiety scores (comprised of the following symptoms: bad dreams, being too shy to play with peers, and missing their parents while at school) were also associated with maternal report of preschoolers DISC-IV-YC depression severity at Time 1 (r_s = .25, p < .05), CBCL internalizing T-scores at Time 1 (r_s = .20, p < .05), as well as CBCL internalizing T-scores at Time 2 (r_s = .24, p < .05). Furthermore, preschoolers' mean BPI anxiety score was not significantly related to their CBCL externalizing T-scores at Time 1 or at Time 2 after controlling for ADHD/ODD severity. BPI anxiety scores at Time 1 were not correlated with parent reported DISC-IV-YC depression severity scores at Time 2.

Comparable CBCL parent rated anxiety scores and child reported BPI anxiety scores were created as described earlier. Both CBCL and BPI modified anxiety scores were transformed to z-scores to make these scores more comparable both analytically and pictorially (see Fig. 2). Results from a one-way ANOVA examining diagnostic group differences in relation to BPI anxiety z-scores indicated a significant effect of diagnosis, F (2,104) = 6.21, p < .01. Specifically, preschoolers in the MDD and ADHD groups had significantly higher BPI anxiety z-scores than preschoolers in the healthy group but the two diagnostic groups did not differ from each other. When examining the CBCL anxiety z-scores, results indicated that unlike child-reported BPI anxiety mean scores there was no main effect of preschoolers' diagnostic group status on parent-reported CBCL anxiety scores.

An additional exploratory analysis was conducted to determine whether the small group of preschoolers with a categorical DSM-IV Generalized Anxiety Disorder (GAD) and/or Separation Anxiety Disorder (SAD) (not previously included as a distinct subset in group comparisons) had significantly higher BPI anxiety scores compared to preschoolers in the no disorder group. Although many preschoolers (79%) with an anxiety disorder had co-occurring MDD, those children who also met criteria for GAD or SAD were separated to form a distinct anxiety group (n = 13) for this analysis. Results from a Mann–Whitney U test revealed that preschoolers in the anxiety group had significantly (p < .01) higher BPI anxiety scores (M = 3.47, SD = 1.24) compared to preschoolers in the no disorder group (M = 1.09, SD = 1.04). A second Mann–Whitney U test was conducted to examine whether parent-report comparable CBCL anxiety scores differentiated preschoolers with an anxiety disorder(s) from those who were healthy. In contrast to the BPI, the CBCL anxiety scores
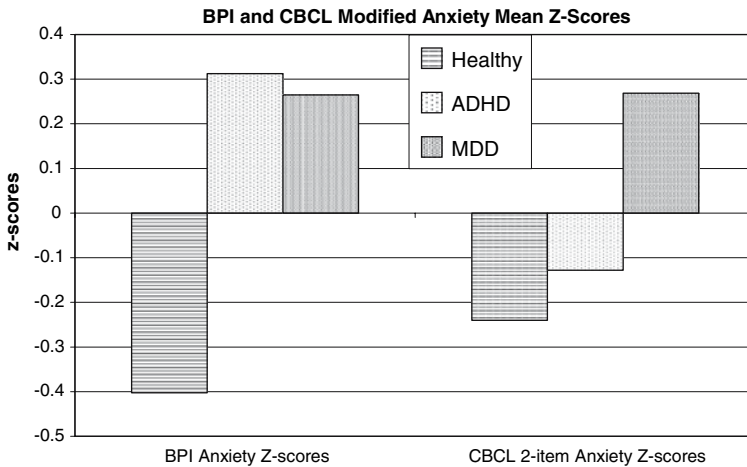
Fig. 2 BPI and CBCL mean anxiety scores were transformed to *z*-score to provide a standardized depiction of their distribution in relation to each other

did not differ significantly between the DSM anxiety group and healthy group (although it did reach a trend level of significance).

Discussion

Findings demonstrated that young children's self-report of several basic core depressive symptom states were significantly related to parental report of depression severity measured at the same point in time as well as parental report of depression severity 6 months later. Further, categorical diagnosis of depression according to parent report on the DISC-IV-YC at baseline was also significantly related to young children's self report of basic core depressive symptoms at baseline. In addition child report of these items was associated with CBCL internalizing T-scores and not externalizing T-scores measured concurrently and 6 months later when the effects of co-morbid disruptive disorders were controlled. The finding of significant associations with internalizing T-scores and not with externalizing T-scores suggests child report on this group of symptoms is specific and is not simply acting as a marker of general psychopathology.

These findings demonstrate that young children's report of these three symptoms, which can be characterized as core symptoms of depression that are basic from an emotion development point of view, is a meaningful indicator of current depression as well as being associated with later depression. Given the well-documented very poor associations between parent and child report of depressive symptoms in older school age and adolescent samples, these results are remarkable in general and particularly for such a young sample [1, 39–42].

Similar findings also emerged for young children's self-report of several basic anxiety symptoms as well. These reports of anxiety symptoms were also associated with parent based categorical DSM-IV diagnosis of GAD and/or SAD, MDD and CBCL internalizing T scores at two time points. While child report of basic anxiety symptoms was associated with dimensional depression severity scores measured concurrently, they were not

associated with depression severity scores 6 months later. These findings demonstrated an association between young child self-report of anxiety and concurrent parent reported diagnosis as well as more general internalizing scores at two time points. It was also quite notable that child report of anxiety on the BPI performed better (e.g. was significantly associated with parent diagnosis) than the comparable parent CBCL anxiety score, suggesting the child measure was more accurate in this domain than the comparable parent measure. In addition, the relatively weaker associations between child reported anxiety symptoms and parental reported depression suggests that self-report of anxiety symptoms are associated but less specific markers of depression as would be expected.

Findings also demonstrated that while young children appear able to validly report on the core basic symptoms of depression based on the associations described, their reports of other more complex and/or abstract depressive symptoms appear less useful based on the absence of significant associations with parent report. Although parent report measures cannot be interpreted as the ''gold standard,'' parent report of preschool depression using age appropriate diagnostic tools has previously proven in the same study sample to be a valid indicator of a clinically significant syndrome based on numerous objective parameters including both observational and biological measures [7, 43]. These findings have strongly suggested that parent reports of preschool depression are valid in general.

These data suggest that while it is worthwhile to ask young children about the tangible core and basic symptoms of depression such as sad or happy moods and crying, they may not be able to accurately report on more abstract or complex constructs such as loneliness, fatigue and low self-esteem. Similarly, in the anxiety domain the data suggest that young children can accurately report being shy with peers, having bad dreams, and missing parents while they are at school. In this domain, it was quite notable that child report emerged as more strongly associated with other parent report measures than a comparable parent report of the same symptoms.

The comparison between the preschooler report BPI basic core depression score and the comparable parent report CBCL depression score to differentiate diagnostic groups was also of interest. Both scales significantly differentiated the healthy from the depressed groups while only the CBCL depression score significantly differentiated the depressed group from the disruptive psychiatric comparison group. In contrast, and also of interest, was the finding that the preschooler rated BPI anxiety score significantly differentiated the depressed from the healthy group while the parent rated CBCL anxiety score failed to differentiate these groups. These findings taken together suggest that the correlations or lack of correlations found are not simply a reporter effect given the unique pattern that emerged (i.e. CBCL performed better than the BPI in the depression domain and worse in the anxiety domain). Further, the comparisons of BPI to the comparable CBCL scores suggests that the limitations are not related to the direct and circumscribed targeted symptom approach since this method performed similarly for both young child and parent informants in the area of depression. Findings suggest therefore that young children are able to report on basic symptoms of depression and anxiety in a limited fashion. Also of interest was the finding that lower income status was related to higher child self-reported depression severity scores. This finding is consistent with previously reported association between low income and higher rates of preschool depression, a phenomenon well established in older depressed samples and therefore lending further support for the validation of child self-report within the limitations outlined [5].

Clinical Implications

Study findings suggest that when age appropriate puppet techniques are applied using the BPI-S, young children may contribute meaningful and valid self-reports of several core and basic symptoms of depression and anxiety. This finding has direct implications for the clinical assessment of depression in young children and suggests that appropriate techniques to obtain the child's self-report are worthwhile when used in a limited fashion. The specific items outlined from measures such as the BPI may be useful in clinical settings although the level of training required to gain proficiency in administration may make this unfeasible in many community based settings. It is also possible that similar less structured play techniques that address basic symptoms such as sadness expressed by one doll and lack of sadness expressed by another may prove a related useful method of tapping the child's mood state, however specific testing of such an approach would be needed. Table 2 outlines the basic content areas and straightforward and simple wording that might be used to explore child self-report in clinical settings. This may have particularly important application for those young children for whom a primary caregiver's report is not available such as situations of parental neglect, institutional care or multiple foster placements. Such circumstances represent high-risk environments for the development of depression and the option of assessing the child directly now appears feasible and potentially important.

At the same time, study findings also suggest that there are limitations to the utility of young child self-report outside of the basic and tangible aspects of depressive and anxious symptom domains. Using parent report as the standard, young child report on other related symptoms of depression such as loneliness and low self-esteem were not significantly associated with either concurrent or 6 month later parent reports on a variety of measures. Despite the deliberate design of these BPI items to make these concepts understandable to a preschool aged child, these areas might simply be too abstract for a young child to understand and label. These findings taken together would support the limited and targeted use of young child self-report in the areas of depression and anxiety but would also suggest lengthy and detailed questioning about related more indirect or abstract symptoms in this area may not be worthwhile.

Limitations

There are several limitations to the study findings. Perhaps the most important is the use of the parent informant as the ''gold standard'' reporter of accurate depressive symptoms in the young child. As previously discussed, the parent informant may miss early depressive symptoms and therefore not be the most accurate informant in this domain. The use of an objective observer, clinician, or a composite measure that incorporates the view of several adult informants might be a superior standard of comparison for use in future study. Findings are also limited by the lack of socioeconomic diversity in the study sample (given that a large proportion of the sample were middle class) as well as a relatively short follow-up period. The clinical application of the findings is also limited by the lack of feasibility of administration of the measures tested in standard clinical settings.

Summary

The assessment of psychopathology in preschool aged children has traditionally relied on adult informants as young children under 6 years-of-age have been widely regarded as

developmentally unable to serve as valid reporters of their own mental state. However, the sole reliance on adult reporters may be highly problematic in the assessment of internalizing disorders such as depression and anxiety as adult caregivers may be less aware of these symptoms. In addition, the importance of accessing multiple informants for the accurate assessment of young child psychopathology has been emphasized. Data validating a preschool depressive syndrome has now become available and methods to obtain self-report of symptoms of depression and related anxiety directly from the child are now needed. The Berkeley Puppet Interview Symptom States (BPI-S), a novel and age appropriate measure of psychopathology designed for the young child informant appears to be a valid tool for assessing symptoms of depression and anxiety in young children when used in a limited fashion. The validity of this measure was established by the demonstration of significant correlations between child report on core depression symptoms to parent report of categorical diagnosis according to the DISC-IV YC as well as on CBCL internalizing symptoms concurrently. In addition, the BPI core depression scores were predictive of later parent reported depression severity. Child report of core anxiety symptoms was also correlated with parent reported internalizing symptoms 6 months later. These findings suggest that young children may serve as useful reporters of several core and basic symptoms of depression and anxiety. However, no significant correlations were found between preschool reports of more complex or abstract symptoms of depression and anxiety. These findings taken together suggest that the young child can validly self-report on some key aspects of depression and anxiety and that age appropriate methods of obtaining child reports in these domains may be clinically useful. However, finding also suggest that these self-reports are limited to the core and basic symptoms of these disorders and that direct age appropriate approaches may not be useful beyond that domain.

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