Published in final edited form as:

Child Psychiatry Hum Dev. 2010 October ; 41(5): 479–489. doi:10.1007/s10578-010-0184-3.

Assessing Disordered Thoughts in Preschoolers with Dysregulated Mood

Amanda K. Hutchison, B.A.¹, Carol Beresford, M.D.¹, JoAnn Robinson, PhD², and Randal G. Ross, M.D.¹

¹ University of Colorado Denver, School of Medicine

² University of Connecticut

Abstract

Objectives—There is rising interest in identifying precursors to bipolar disorder symptoms, including thought disorder. Thought disorder is identified in adults through self-report and in school-aged children through parent report and child story-telling. This study is an exploration to determine if preschoolers with mood dysregulation have evidence of disordered thoughts using a story-stem completion method.

Methods—Participants included two groups of 3.5–6 year-old children: 20 with mood dysregulation including manic symptoms and 11 typically-developing comparison children. Children were administered story completion narratives including one story where the child character accidentally cuts him/herself while pretending to cook. The children were asked to complete the stories and their responses were analyzed for atypical themes consistent with disordered thoughts such as violence or bizarreness outside of the story or props coming to life.

Results—35% of symptomatic preschoolers versus 0% of typically-developing preschoolers ascribed independent actions to inanimate props ($p=0.03$). 80% of symptomatic preschoolers versus 9% of typically-developing preschoolers utilized props in a violent or bizarre manner outside the central story ($p<0.001$).

Conclusions—Preschool children with symptoms of dysregulated mood express themes related to the unusual use of story props which may indicate disordered thoughts. This preschool expression of dysregulated mood appears similar to and possibly continuous with school-age and adult versions of bipolar disorder.

Keywords

preschool; dysregulated mood; disordered thought; mania; story completion; bipolar disorder; thought disorder

Introduction

There is increasing recognition that many psychiatric disorders can present at very young ages. For example, there is mounting evidence that symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD) such as hyperactivity, impulsivity and inattention can be identified in children as young as 3 years of age (1–3). Similarly, symptoms of depression like observed shame and guilt can be accurately assessed in 3–4 year-olds (4–7). A more

Corresponding Author and Reprint Requests: Randy Ross, M.D., Department of Psychiatry, University of Colorado Denver Anschutz Medical Campus, P.O.Box 6508, Campus Box F546, Aurora, CO 80045, Telephone: 303-724-6203, Fax: 303-724-6207, randy.ross@ucdenver.edu.

controversial example relates to bipolar disorder. There are reports suggesting ability to recognize mania in preschool children (6, 8–10). For these children symptoms are present and cause dysfunction. Some of these symptoms include irritability, aggression, elation, grandiosity, hyper-talkativeness, flight of ideas, and hypersexuality (10). However, while symptomatically similar, these symptoms are not the same as those seen in older individuals, differing in both duration and quality. This raises questions about the continuity of preschool illness with versions seen in older children and adults. Thus it remains unclear whether these symptoms represent an early form of bipolar illness. Reviews of the controversy about preschool bipolar disorder are available that address both duration and intensity (10–12). The literature available addressing this controversy has not addressed the lower age limit at which other symptoms suggestive of disordered mood, like disordered thoughts may be present.

A number of approaches to address continuity between childhood and later onset illnesses are possible (13). For example, one method to explore continuity between child and adult disorders has been to examine similarity of symptom presentation. To assess thought disorder in adults, patients are interviewed for self-report of symptoms. Thought disorder in adults can consist of loose associations and bizarre or illogical thinking (14) most commonly defined by the language used to describe thoughts. Patient interviews often include a standardized rating scale that assesses thought disorder like the Young Mania Rating Scale (YMRS) (15) where the interviewer asks the patient directly about symptoms.

Just as adults are asked about their symptoms, interviews with school-aged children (7 years old) are often necessary. School-aged children can have symptoms similar to adults with bipolar illness including mania (16, 17) and thought disorder (17–19). In school-age bipolar disorder, formal thought disorder includes “impaired comprehensibility, loosening of associations, pressure of speech and illogical thinking” (17). As in adults, the YMRS has been effective in helping to define bipolar disorder in children seven years old and older (19).

However, as studies involve younger subjects, alternative interactions are often required. One technique is to utilize story-telling as a mechanism to observe thought disorder (18, 20). For 7–13 year-old children, the Kiddie Formal Thought Disorder Rating Scale (K-FTDS) (18) uses a story completion technique where the child listens to and then retells a story before creating a story of his/her own. Storytelling works better for this age than a standard psychiatric interview because it allows for a sufficient speech sample to be produced and then analyzed compared to the two- or three word phrases often obtained from standard interviewing technique (18). The K-FTDS is effective in identifying thought disorder in children with psychotic disorders seven years and older (18). However, the K-FTDS is inappropriate to study thought disorder in preschool children because the younger the child below the age of seven, the less effective the instrument.

While the K-FTDS is not suitable for preschoolers, the fundamental methodological approach of analyzing child response during story-stem completion can be extended to younger ages. Children as young as three years-old are capable of completing stories once given some practice, thereby allowing exploration of their thinking (21). It seems to follow that if story-telling can reveal thought disorder in school-aged children, and preschool children who may be predisposed to disordered thoughts are capable of completing stories, that story completion may provide a method to detect disordered thoughts in preschool children.

One such story completion method is a well-studied, semi-structured interview of children as young as three: the MacArthur Story Stem Battery (MSSB) (21). However, this method has not been used to study disordered thinking. Recently, the MSSB has been used with

parent interview as a self-report measure to study mania and depression in preschool children (4, 7, 8). Using standardized scoring paradigms for children with diverse psychiatric concerns, preschoolers with mania differ from typically developing children in terms of revealing more themes of dysregulated or unprovoked aggression (8). The MSSB themes found in these clinical groups correlate with parental report of symptoms (4, 7, 8). The MSSB has been found to correlate highly with parent and teacher reported symptoms and behaviors in other studies (22–24). The MSSB provides a valuable addition to parent report in the psychiatric study of preschool children.

While story completion methods are commonly used to explore cognition in preschool children, narratives have not been utilized to study disordered thoughts in preschool children. The lower age limit at which children can have symptoms like disordered thoughts is unknown. This report represents a preliminary effort to report early attempts with story-stem completion to assess disordered thought in preschool children with symptoms of dysregulated mood.

Materials and Methods

Participants

This study used a group of previously described preschoolers with mood dysregulation(8). Twenty children (7 female) were included in a clinically-referred group and a group of eleven (6 female) typically-developing children were included as a comparison sample. The groups did not differ significantly in terms of age (mean age 4.35 years typically developing vs 4.79 years clinically referred, $t(31) = 1.47$, $p=0.15$) or gender (Fisher's exact test, $p=0.25$). Parents of children in the referred group had fewer years of education compared to parents of typically developing children (25% graduated high school only vs. 5%, and 21% attended graduate school vs. 53%; Fisher's exact test, $p<0.001$).

Diagnostic and IQ Measures

Subjects were referred by community psychiatrists, psychologists and pediatricians with symptoms suggestive of mania or mood dysregulation. Subjects were evaluated through parent report using the Preschool Age Psychiatric Assessment (PAPA) (25) and the Washington University Kiddie Schedule for Schizophrenia and Affective Disorders(WASH-U-KSADS) (26). Both the PAPA and the WASH-U-KSADS provide, for each manic symptom, a score (0, 2, or 3 for the PAPA, meaning 0 for not present and 2 or 3 for present; and 1–7, on severity, for the WASH-U-KSADS) and scores can be added across symptoms to provide an overall severity score. Both the PAPA and WASH-U-KSADS have previously been assessed for reliability: For the PAPA for children as young as age 2 years, test-retest correlations to the DSM-IV syndrome scale scores range from 0.56–0.89 (27); for the WASH_U_KSADS, interrater reliability as measured by κ , is estimated to be between 0.74 and 1.00 (26). Scores were assigned for the following symptoms occurring with elated or irritable mood: expansive mood, irritability within the same day as expansive mood, depressed mood within the same day as expansive mood, the presence of 2 months of remission of mood symptoms in the previous year, more talkative than usual, pressure of speech, flight of ideas, motor pressure, agitation, distractibility, decreased need for sleep, grandiosity, poor judgment, delusions, hallucinations, thought process abnormality, idiosyncratic behavior.

From the PAPA and WASH-U-KSADS, twenty children (7 female), were given a best estimate diagnosis of mania. A history of attention deficit-hyperactivity disorder (ADHD) was identified in 6 (30%) of the clinically referred children, a rate below that seen in older children (11, 28–30). A history of physical/sexual abuse was an exclusionary criterion and

none of the subjects, clinically-referred or typically developing, met criteria for PTSD. A group of eleven (6 female) typically-developing children were also included as a comparison sample.

The vocabulary and block design subtests of the Wechsler Preschool and Primary Scale of Intelligence-III (WPPSI-III) were used as a proxy for IQ to ensure that both groups had average intelligence (31). Vocabulary and block design subtests correlate at 0.84 and 0.85, respectively, with full-scale IQ (32). Mean standard scores in both groups were within the normal range; however, the referred group scored significantly lower than in the typically-developing comparison group on both vocabulary standard scores (referred mean = 11.6, SD = 2.1; typically-developing mean = 14.5, SD = 2.8, $t(1,27) = 3.18$, $p < 0.01$) and block design standard scores (referred mean = 11.6, SD = 2.5; typically developing mean = 13.8, SD = 2.4; $t(1,28) = 2.37$, $p < 0.05$).

Story Completion Measures

Children were administered stories from the MacArthur Story Stem Battery (33) and one story, the Band-Aid® story, adapted from the Family Story Task (FAST) (34). The narratives begin with the experimenter presenting a “story-stem” that leads to a conflict the child is invited to resolve through role-playing. This report focuses only on the Band-Aid® story (refer to (8) for results of other stories). The Band-Aid® story consists of a child who is pretending to cook and knows he/she is not supposed to play with knives, but does so anyway. Then the child cuts his/her finger and starts to bleed. This story includes props of a small pot and a tiny, non-sharp pretend knife. The child is asked to show and tell what happens next in the story. The stories were video-taped through a one-way mirror to allow for non-distracting recording that was used to code themes present in the stories.

The narratives were scored from the recordings using standard scoring parameters by trained coders, blind to subject group membership and study hypothesis (8). Typically-developing preschoolers tend to respond to the Band-Aid® story by saying that the parents gave the child a Band-Aid®, kissed the finger to make it feel better and then scolded the child to make sure that he/she never plays with knives again. However, it was apparent after scoring the first few subjects that previously undescribed thematic processes were present, where children ascribed independent actions to inanimate props and/or the props were used in a violent or bizarre manner outside the central story theme in the Band-Aid® story. New codes were developed based on these findings. The first new code was “prop is involved in violence or bizarreness outside of the story stem” and the second new code was “prop comes to life.” All tapes were re-reviewed by trained scorers who had not been involved in development of the new codes and were blind to subject group membership and study hypothesis. Inter-rater reliability between the coders was established on a larger sample of low-SES children.

A parent or guardian provided written informed consent for all subjects as monitored by a local Institutional Review Board.

Results

Parent-Reported Symptom Results

Through parent interviews using the WASH-U-KSADS and the PAPA specific mania symptoms were identified. Tables 1 and 2 summarize the interview results.

Specific mania symptoms (on the WASH-U-KSADS) occurred significantly more frequently in the clinically-referred than the typically-developing group. The PAPA

composite intensity score (as defined above) was 1.25 ± 2.22 for the typical group, and 19.74 ± 10.39 for the clinically-referred group ($t(30)=6.23$, $p<0.001$).

Story Completion Results

The blind coders identified several examples of each new code. Examples are noted in Table 3.

Seven (35%) symptomatic preschoolers versus zero (0%) typically-developing preschoolers brought props to life (Fisher's exact test, $p=0.033$). Sixteen (80%) symptomatic preschoolers versus one (9%) typically-developing preschooler utilized props in a violent or bizarre manner outside the central story (Fisher's exact test, $p<0.001$; Table 4).

Discussion

Preschool children with symptoms of mood dysregulation express themes related to unusual use of story props. Bizarre, violent use of props and props coming to life represent disorganization of cognition in the clinically-referred group. One possible explanation of these findings is that the story-stems captured disordered thinking in the clinically-referred group. In school-age children, story completion responses consistent with thought disorder include illogical thinking, incoherence, poverty of content of speech and loose associations (18). Illogical thinking and loose associations most reliably differentiated the children with psychotic disorders from typically developing children (18). In illogical thinking, the child does not give the listener appropriate explanation for "causal and non-causal utterances or contradicts himself/herself" (20). This may be related to the preschool responses where props came to life, as this usually happened without any explanation. With loose associations, the child does not prepare the listener for change in topic of the story (20) and this may be relevant to the preschoolers' stories where the theme suddenly turns to bizarreness or violence outside the original story-stem. In preschool children with dysregulated mood, disordered thinking similar to formal thought disorder found in school-aged children with psychosis may be present. The report by our expert coders that these themes were not present in other groups supports their relationship to more cognitively impaired psychiatric illness, although empirical evidence will need to be assessed.

Additional research to investigate the specificity of these findings to preschool mood dysregulation is indicated, including replication of current findings with a large, culturally representative sample. After replication, comparison of findings to other psychiatrically referred groups is necessary. As ADHD and mood disorders have overlapping symptomatology (35–38) and ADHD may be a risk factor predicting a switch to bipolar disorder in depressed children (39), determining if this pattern of disordered thinking is present or absent in ADHD may lend insight into further differentiating ADHD from mood disorders.

Another clinical group where this method might find application is in psychotic disorders in young children. Thought disorder is a primary symptom in adults with schizophrenia and bipolar disorder. However, bipolar disorder and schizophrenia cannot be differentiated on this symptom alone (40, 41). Furthermore, thought disorder may be prodromal for either bipolar disorder or schizophrenia (42). To gauge the continuity and stability of symptoms like thought disorder over time, it is necessary to assess similar symptoms in younger cohorts. It is unclear whether the disordered thinking described here in preschoolers represents a pre-bipolar state or a more general risk for psychotic disorders, although the population from this study scored highly on the index of manic symptoms (8).

There is also evidence that children with Autism Spectrum Disorders exhibit thought disorder (43). Defining differences or similarities in disordered thought and its presence or absence through narratives could provide further insight into differences between these groups. If these responses in fact represent thought disorder, it is necessary to follow these children over time to see if evidence of thought disorder persists.

In addition to using the story completion method in other clinical populations to assess disordered thoughts, more specific research should be done to develop new stories to clarify some questions raised in this study. In the Band-Aid® story, blood and a sharp, potentially dangerous knife are included in the story-stem. It is unclear whether either, both or neither of these factors triggered the bizarre responses in the clinically-referred group. This study illustrates the importance of selecting and analyzing stories with particular focus to suit the needs of the study population (44, 45). In addition, to better understand the thinking expressed by the clinically-referred group the additional codes were essential. The scoring system of preschool story-stem completion methodologies has been expanded over time to capture emerging themes that were not in the original scoring system (46, 47). In the future, including stories that can be coded using the new categories involving other sharp objects or blood in separate stories may help to elucidate what may have initiated bizarre story responses in the clinical group.

This is the first report suggesting the presence of disordered thought in preschoolers with dysregulated mood. Additional clarification of the issue will improve understanding of early expression of mood disorders and stability of symptoms over time, which may lead to earlier identification and treatment.

Summary

There is rising interest in identifying precursors to bipolar disorder symptoms, including thought disorder. Thought disorder is identified in adults through self-report and in school-aged children through parent report and child story-telling. This study is an exploration to determine if preschoolers with mood dysregulation have evidence of disordered thoughts using a story-stem completion method. Participants included two groups of 3.5–6 year-old children: 20 with mood dysregulation including possible manic symptoms and 11 typically-developing comparison children. Manic symptoms included those occurring with elated or irritable mood: expansive mood, irritability within the same day as expansive mood, depressed mood within the same day as expansive mood, the presence of 2 months of remission of mood symptoms in the previous year, more talkative than usual, pressure of speech, flight of ideas, motor pressure, agitation, distractibility, decreased need for sleep, grandiosity, poor judgment, delusions, hallucinations, thought process abnormality, idiosyncratic behavior. Children were administered story completion narratives including one story where the child character accidentally cuts him/herself while pretending to cook. Typical children generally respond to the story by saying that the parents gave the child a Band-Aid®, kissed the finger to make it feel better and then scolded the child to make sure that he/she never plays with knives again. The children were asked to complete the stories and their responses were analyzed for atypical themes consistent with disordered thoughts such as violence or bizarreness outside of the story or props coming to life. 35% of symptomatic preschoolers versus 0% of typically-developing preschoolers ascribed independent actions to inanimate props ($p=0.03$). 80% of symptomatic preschoolers versus 9% of typically-developing preschoolers utilized props in a violent or bizarre manner outside the central story ($p<0.001$). Preschool children with symptoms of dysregulated mood express themes related to the unusual use of story props which may indicate disordered thoughts. Further work to determine replicability and whether the findings are specific to mood-dysregulated children is critical. However, this approach may provide a means for

identifying thought disorder in preschool children. If true, this may lead to earlier characterization, diagnosis, and treatment of preschool neuropsychiatric disorders. It also remains to be determined if the preschool expression of dysregulated mood is similar to and possibly continuous with school-age and adult versions of bipolar disorder.

Acknowledgments

This work was supported by the National Institutes of Health: grants MH015442, MH066115, MH068582, MH080859, MH056539 and MH086383.

We wish to thank the families that generously volunteered their time to participate, and Kate Hanna, Sharon Hunter, and Robert Freedman for their support and advice during the writing of this manuscript.

References

1. Lavigne J, Gibbons R, Christoffel K, Arend R, Rosenbaum D, Binns H, et al. Prevalence rates and correlates of psychiatric disorders among preschool children. *J Am Acad Child Adolesc Psychiatry*. 1996; 35:204–14. [PubMed: 8720630]
2. Lavigne J, LeBailly S, Hopkins J, Gouze K, Binns H. The prevalence of ADHD, ODD, depression, and anxiety in a community sample of 4-year-olds. *J Clin Child Adolesc Psychol*. 2009; 38:315–28. [PubMed: 19437293]
3. Kratochvil C, Vaughan B, Barker A, Corr L, Wheeler A, Madaan V. Review of pediatric attention deficit/hyperactivity disorder for the general psychiatrist. *Psychiatr Clin North Am*. 2009; 32:39–56. [PubMed: 19248915]
4. Belden A, Sullivan J, Luby J. Depressed and healthy preschoolers' internal representations of their mothers' caregiving: associations with observed caregiving behaviors one year later. *Attach Hum Dev*. 2007; 9:239–54. [PubMed: 18058432]
5. Luby J, Belden A, Sullivan J, Spitznagel E. Preschoolers' contribution to their diagnosis of depression and anxiety: uses and limitations of young child self-report of symptoms. *Child Psychiatry Hum Dev*. 2007; 38:321–38. [PubMed: 17620007]
6. Luby J, Belden A. Clinical characteristics of bipolar vs. unipolar depression in preschool children: an empirical investigation. *J Clin Psychiatry*. 2008; 69:1960–9. [PubMed: 19192470]
7. Luby J, Belden A, Sullivan J, Hayen R, McCadney A, Spitznagel E. Shame and guilt in preschool depression: evidence for elevations in self-conscious emotions in depression as early as age 3. *Journal of Child Psychology and Psychiatry*. 2009; 50:1156–66. [PubMed: 19490311]
8. Beresford C, Robinson J, Holmberg J, Ross R. Story stem responses of preschoolers with mood disturbances. *Attach Hum Dev*. 2007; 9:255–70. [PubMed: 18058433]
9. Luby J, Belden A. Defining and validating bipolar disorder in the preschool period. *Dev Psychopathol*. 2006; 18:971–88. [PubMed: 17064425]
10. Luby J, Tandon M, Belden A. Preschool bipolar disorder. *Child Adolesc Psychiatr Clin N Am*. 2009; 18:391–403. ix. [PubMed: 19264269]
11. Leibenluft E, Rich B. Pediatric bipolar disorder. *Annu Rev Clin Psychol*. 2008; 4:163–87. [PubMed: 17716034]
12. McClellan J, Kowatch R, Findling R. Practice parameter for the assessment and treatment of children and adolescents with bipolar disorder. *J Am Acad Child Adolesc Psychiatry*. 2007; 46:107–25. [PubMed: 17195735]
13. Nicolson R, Lenane M, Hamburger S, Fernandez T, Bedwell J, Rapoport J. Lessons from childhood-onset schizophrenia. *Brain Res Brain Res Rev*. 2000; 31:147–56. [PubMed: 10719143]
14. Solovay M, Shenton M, Gasperetti C, Coleman M, Kestnbaum E, Carpenter J, et al. Scoring manual for the Thought Disorder Index. *Schizophr Bull*. 1986; 12:483–96. [PubMed: 3764364]
15. Young R, Biggs J, Ziegler V, Meyer D. A rating scale for mania: reliability, validity and sensitivity. *Br J Psychiatry*. 1978; 133:429–35. [PubMed: 728692]
16. Geller B, Zimmerman B, Williams M, Delbello M, Frazier J, Beringer L. Phenomenology of prepubertal and early adolescent bipolar disorder: examples of elated mood, grandiose behaviors,

- decreased need for sleep, racing thoughts and hypersexuality. *J Child Adolesc Psychopharmacol*. 2002; 12:3–9. [PubMed: 12014593]
17. Pavuluri M, Herbener E, Sweeney J. Psychotic symptoms in pediatric bipolar disorder. *J Affect Disord*. 2004; 80:19–28. [PubMed: 15094254]
 18. Caplan R, Guthrie D, Fish B, Tanguay P, David-Lando G. The Kiddie Formal Thought Disorder Rating Scale: clinical assessment, reliability, and validity. *J Am Acad Child Adolesc Psychiatry*. 1989; 28:408–16. [PubMed: 2738008]
 19. Saxena K, Nakonezny P, Simmons A, Mayes T, Walley A, Emslie G. Outpatient diagnosis and clinical presentation of bipolar youth. *J Can Acad Child Adolesc Psychiatry*. 2009; 18:215–20. [PubMed: 19718422]
 20. Caplan R, Guthrie D, Tang B, Komo S, Asarnow RF. Thought disorder in childhood schizophrenia: Replication and update of concept. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:771–8. [PubMed: 10846312]
 21. Bretherton, I.; Oppenheim, D. The MacArthur Story-Stem Battery: Development, Administration, Reliability, Validity and Reflections About Meaning. In: Emde, R.; Wolf, D.; Oppenheim, D., editors. *Revealing the Inner Worlds of Young Children: The MacArthur Story Stem Battery and Parent-Child Narratives*. New York: Oxford University Press; 2003. p. 55-80.
 22. von Klitzing K, Kelsay K, Emde RN, Robinson J, Schmitz S. Gender-specific characteristics of 5-year-olds' play narratives and associations with behavior ratings. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:1017–23. [PubMed: 10939230]
 23. Warren SL, Oppenheim D, Emde RN. Can emotions and themes in children's play predict behavior problems? *Journal of the American Academy of Child and Adolescent Psychiatry*. 1996; 35:1331–7. [PubMed: 8885587]
 24. Macfie J, Cicchetti D, Toth S. The development of dissociation in maltreated preschool-aged children. *Dev Psychopathol*. 2001; 13:233–54. [PubMed: 11393645]
 25. Egger, H.; Angold, A. *The Preschool Age Psychiatric Assessment*. Durham, NC: Center for Developmental Epidemiology, Dept of Psychiatry and Behavioral Sciences, Duke University; 1999.
 26. Geller B, Zimmerman B, Williams M, Bolhofner K, Craney JL, DelBello MP, et al. Reliability of the Washington University in St. Louis Kiddie Schedule for Affective Disorders and Schizophrenia (WASH-U-KSADS) mania and rapid cycling sections. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2001; 40:450–5. [PubMed: 11314571]
 27. Egger H, Erkanli A, Keeler G, Potts E, Walter B, Angold A. Test-Retest Reliability of the Preschool Age Psychiatric Assessment (PAPA). *J Am Acad Child Adolesc Psychiatry*. 2006; 45:538–49. [PubMed: 16601400]
 28. Geller B, Tillman R, Craney J, Bolhofner K. Four-year prospective outcome and natural history of mania in children with a prepubertal and early adolescent bipolar disorder phenotype. *Arch Gen Psychiatry*. 2004; 61:459–67. [PubMed: 15123490]
 29. Dickstein D, Rich B, Binstock A, Pradella A, Towbin K, Pine D, et al. Comorbid anxiety in phenotypes of pediatric bipolar disorder. *J Child Adolesc Psychopharmacol*. 2005; 15:534–48. [PubMed: 16190786]
 30. Axelson D, Birmaher B, Strober M, Gill M, Valeri S, Chiappetta L, et al. Phenomenology of children and adolescents with bipolar spectrum disorders. *Arch Gen Psychiatry*. 2006; 63:1139–48. [PubMed: 17015816]
 31. Wechsler, D. *Wechsler Preschool and Primary Scale of Intelligence. III*. New York: Psychological Corporation; 2002.
 32. Wechsler, D. *Wechsler Preschool and Primary Scale of Intelligence -Revised (WPPSI-R):Short Form Vocabulary and Block Design*. The Psychological Corporation ; Clinical Sales 555 Academic Court San Antonio, Texas 78204 (800) 211–8378: 1989. p. 1-6.
 33. Bretherton I, Oppenheim D, Emde R, Group MNW. Appendix: The MacArthur Story Stem Battery. 2003
 34. Shamir H, Schudlich T, Cummings M. Marital Conflict, parenting styles, and children's representations of family relationships. *Parenting: Science and Practice*. 2002; 1:123–51.

35. Biederman J, Faraone S, Wozniak J, Monuteaux M. Parsing the association between bipolar, conduct, and substance use disorders: a familial risk analysis. *Biol Psychiatry*. 2000; 48:1037–44. [PubMed: 11094136]
36. Biederman J, Mick E, Faraone S, Spencer T, Wilens T, Wozniak J. Pediatric mania: a developmental subtype of bipolar disorder? *Biol Psychiatry*. 2000; 48:458–66. [PubMed: 11018219]
37. Biederman J, Mick E, Wozniak J, Monuteaux M, Galdo M, Faraone S. Can a subtype of conduct disorder linked to bipolar disorder be identified? Integration of findings from the Massachusetts General Hospital Pediatric Psychopharmacology Research Program. *Biol Psychiatry*. 2003; 53:952–60. [PubMed: 12788240]
38. Biederman J, Faraone S, Monuteaux M, Bober M, Cadogan E. Gender effects on attention-deficit/hyperactivity disorder in adults, revisited. *Biol Psychiatry*. 2004; 55:692–700. [PubMed: 15038997]
39. Biederman J, Petty C, Byrne D, Wong P, Wozniak J, Faraone S. Risk for switch from unipolar to bipolar disorder in youth with ADHD: A long term prospective controlled study. *J Affect Disord*. 2009; 119:16–21. [PubMed: 19324422]
40. Lake CR. Disorders of thought are severe mood disorders: the selective attention defect in mania challenges the Kraepelinian dichotomy - a review. *Schizophrenia Bulletin*. 2008; 34:109–17. [PubMed: 17515440]
41. Ledda M, Fratta A, Pintor M, Zuddas A, Cianchetti C. Early-onset psychoses: comparison of clinical features and adult outcome in 3 diagnostic groups. *Child Psychiatry Hum Dev*. 2009; 40:421–37. [PubMed: 19280338]
42. Correll CU, Penzner JB, Frederickson AM, Richter JJ, Auther AM, Smith CW, et al. Differentiation in the preonset phases of schizophrenia and mood disorders: Evidence in support of a bipolar mania prodrome. *Schizophrenia Bulletin*. 2007; 33:703–14. [PubMed: 17478437]
43. Solomon M, Ozonoff S, Carter C, Caplan R. Formal thought disorder and the autism spectrum: relationship with symptoms, executive control, and anxiety. *J Autism Dev Disord*. 2008; 38:1474–84. [PubMed: 18297385]
44. Bettmann J, Lundahl B. Tell Me a Story: A Review of Narrative Assessments for Preschoolers. *Child Adolesc Soc Work J*. 2007; 24:455–75.
45. Sher-Censor, F.; Oppenheim, D. Coherence and Representations in Preschoolers' Narratives: Associations with Attachment in Infancy. In: Pratt, M.; Fiese, B., editors. *Family Stories and the Life Course*. New Jersey: Lawrence Erlbaum Associates; 2004. p. 77-106.
46. Robinson, J.; Mantz-Simmons, L. The MacArthur Narrative Coding System: One approach to highlighting affective meaning making in the MacArthur Story Stem Battery. In: Emde, R.; Wolf, D.; Oppenheim, D., editors. *Revealing the Inner Worlds of Young Children: The MacArthur Story Stem Battery and Parent-Child Narratives*. Oxford: Oxford University Press; 2003. p. 81-91.
47. Hill J, Fonagy P, Lancaster G, Broyden N. Aggression and intentionality in narrative responses to conflict and distress story stems: an investigation of boys with disruptive behaviour problems. *Attach Hum Dev*. 2007; 9:223–37. [PubMed: 18058431]

Table 1

Results of parent-report interviews: the total group of clinically-referred preschoolers is compared to typical preschoolers.

	Typical Group, n=12— Score greater than 2:		Clinically-Referred Group (Mania symptoms), n=19 for PAPA, & 17 for KSADS— Score greater than 2:		Fisher's Exact— p-values*
	YES	NO	YES	NO	
PAPA, total on mania/psychosis items	2	10	18	1	<0.001
KSADS, expansive mood	1	11	12	5	0.002
KSADS, grandiosity	0	12	10	7	0.001
KSADS, irritability	1	11	15	2	<0.001
KSADS, accelerated, pressured, or increased speech	0	12	15	2	<0.001
KSADS, decreased need for sleep	0	12	4	13	0.121
KSADS, flight of ideas	0	12	11	6	<0.001
KSADS, distractibility	1	11	15	2	<0.001
KSADS, increased goal-directed activity/agitation	1	11	11	6	0.003
KSADS, poor judgment	0	12	13	4	<0.001
KSADS, hypersexuality	0	12	6	11	0.028

* Fisher's exact analysis is used to calculate p-values, comparing the proportions with scores greater than 2.

Table 2

Symptom frequency in clinically-referred versus typically-developing groups.

Number (%) of children with...	Clinically-Referred (Mania symptoms) (n=19)	Typically Developing (n= 12)	p ^d
Mood symptoms (periods of...) ^a			
Elated/expansive mood	16 (84%)	2 (17%)	<0.001
Irritable mood	17 (89%)	1 (8%)	<0.001
Depressed mood	4 (21%)	0	0.139
Associated symptoms ^b			
Grandiosity	13 (68%)	0	<0.001
Decreased need for sleep	7 (37%)	0	0.026
Increased amount of speech, or pressured	17 (90%)	0	<0.001
Flight of ideas or racing Thoughts	16 (84%)	0	<0.001
Increased distractibility	15 (79%)	1 (8%)	<0.001
Increased goal-directed behavior or agitation	11 (58%)	1 (8%)	0.008
Increased involvement in pleasurable activities with high potential for painful consequences ^c	11 (58%)	0	0.001

^aNo duration criterion was included; children were considered positive if they scored at least 2 on the PAPA and/or 3 on the WASH-U-KSADS.

^bOccurring during periods of mood symptoms.

^cSymptoms: hypersexuality, or dangerous running, jumping, climbing.

^dp-values based on Fisher's exact test.

Table 3

Examples of Child Narratives found in the clinically-referred group include

"It's a walking knife--It stucked her. It cut her hair off. It cut her arm off."
The doll puts the knife between his legs to make a tail. The subject says that the table walks, and the pot and the knife run away.
The child character says that an invisible child cut the pot. Later, the invisible child cuts the floor; then the characters fall in the hole.
"The knife and pan are fighting. They are floating."
Without explanation by the child narrator, the child doll says, "I have a pot on my foot." Mother doll says, "I have a pot foot and a knife foot."
"The band-aids were off (the child doll) and mom, and they flew over the trash can."
The child doll throws the knife into his room where it gets lost under his bed. Then, without explanation, the knife cuts the foot of the mother doll who awakes in pain with the knife between her toes.
"The mom flies off with the pot (on her head)."

The presence or absence of individual MSSB codes on the Band-Aid® story: clinically-referred preschoolers are compared by Fisher's exact analysis to typical children

Table 4

INDIVIDUAL MSSB CODES Band-Aid® story	Typical Group, n=11		Clinically-referred Group, n=20		Fisher's Exact p values
	Yes	No	Yes	No	
New scores related to usage of props					
Prop is involved in violence or bizarreness outside of story stem	1	10	16	4	<0.001
Prop comes to life	0	11	7	13	0.033