Pictorial Instrument for Children and Adolescents (PICA-III-R)

[Special Section: Research Psychiatric Diagnostic Interviews for Children and Adolescents]

ERNST, MONIQUE M.D., Ph.D.; COOKUS, BRIDGET A. M.A.; MORAVEC, BIANCA C. B.A.

From the Brain Imaging Center, National Institute on Drug Abuse, National Institutes of Health, Baltimore.

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Correspondence to Dr. Ernst, National Institute on Drug Abuse, Brain Imaging Center, 5500 Nathan Shock Drive, Baltimore, MD 21224; mernst@intra.nida.nih.gov.

ABSTRACT

Objective: The Pictorial Instrument for Children and Adolescents (PICA-III-R) is presented as part of a comprehensive review of the tools used to diagnose psychiatric disorders in children and adolescents.

Method: The PICA-III-R's development, content, initial psychometric properties, and directions for use are described.

Results: The PICA-III-R assesses all DSM-III-R Axis I psychiatric disorders in children aged 6 to 16 years, categorically (diagnosis present or absent) and dimensionally (range of severity). It comprises 137 pictures organized in modules that cover 5 diagnostic categories, including disorders of anxiety, mood, psychosis, disruptive behavior, and substance abuse. Its initial psychometric properties are promising, with good internal consistency, significant discriminative power for diagnoses, and sensitivity to changes.

Conclusions: Despite great interest expressed by child and adolescent psychiatrists, further testing has not been possible for practical reasons unrelated to the scientific importance of such work. Although it needs to be modified to follow DSM-IV criteria, the PICA-III-R can be of significant help to child and adolescent psychiatrists, for clinical as well as research diagnostic purposes. In addition, it can be used for the assessment of non-English-speaking or hearing/speech-impaired children.

The Pictorial Instrument for Children and Adolescents (PICA-III-R) (Ernst et al., 1994) was developed to assess DSM-III-R Axis I psychiatric disorders (American Psychiatric Association, 1987) in children aged 6 to 16 years. It provides a categorical (diagnosis present or absent) and dimensional (range of severity) evaluation of child psychopathology. The impetus to engage in this endeavor originated from the difficulty in conducting the commonly used interviews for children (several of which are described elsewhere in this Special Section), which rely mainly on verbal communication. Despite considerable efforts to adapt the level of verbal and conceptual complexity to the cognitive
maturational stages of children, limitations such as attention span, abstract thinking, and verbal ability in children cannot be easily overcome in such verbally driven interviews. Hence, the use of a different interview format based on a familiar and concrete means of expression such as visual communication may prove more successful. Instead of being asked questions verbally, the child is presented with images that depict the questions. Experience with this visual format had been previously gained from the development of a 29-item pictorial psychiatric rating scale aimed at assessing the psychiatric mental status of non-English-speaking adults (Ernst and Vingiano, 1989). During the validation of this instrument in psychiatric adult patients who were English-speaking, it became clear that patients felt more comfortable using pictures as an intermediate between the examiner and themselves and were better able to recognize and rate their symptoms than with a standard mental status evaluation. This article will review the content, directions for use, and initial psychometric properties of the PICA-III-R (Ernst et al., 1994) and will compare it with other pictorial instruments. Despite the promising initial validation of the PICA-III-R, no further work has been done (for reasons unrelated to its scientific importance).

**DESCRIPTION OF THE PICA-III-R**

The PICA-III-R is a semistructured interview with 137 pictures organized in modules covering 5 diagnostic categories: anxiety disorders, mood disorders, psychotic disorders, disruptive behavior disorders, and substance abuse. It comprises a total of 14 subscales, each assessing an Axis I psychiatric diagnosis.

The content of each picture is simple, schematic, and neutral and refers to a single *DSM-III-R* criterion. The pictures encompass emotions, behaviors, thought content, thought process, or vegetative signs relevant to each criterion. The gender of the child in the pictures is ambiguous. Indeed, the neutrality of the drawings was sought to facilitate the identification of the patient to the child and situation depicted in the drawings. Items of the 2 subscales of major depression and psychotic disorders are presented in Figures 1 through 5.
Fig. 1 Sadness. Do you get like him? How much? Do you feel sad the way that he does? Do people tell you that you look sad? How much? What about crying? How much does it happen to you?

Fig. 2 Boredom. Do you get like him? How much? He feels really bored. Even the toys he used to play with don't interest him anymore. Are you like him? How much?
Fig. 3 Suicide. Do you get like him? How much? Do you think about things the way that he does? About hurting or killing yourself? How much? Did you ever do anything to try to hurt or kill yourself?
Fig. 4 Thought Insertion. Do you get like him? How much? Someone put an idea into his head and made him think it. Do people do that to you? How much does it happen to you? DISTINGUISH BETWEEN CHILDREN WHO WILL SAY THEIR PARENTS MAKE THEM ACT A CERTAIN WAY OR DO THINGS, AND THOUGHT INSERTION.
Fig. 5 Auditory Hallucinations. Do you get like him? How much? He can hear things that other people can't hear. Do your ears play tricks on you like that? How much does that happen to you? How much? Does it happen to you only when you fall asleep? How much? Does it happen to you only when you wake up? How much? CLARIFY HOW OFTEN IT HAPPENS, AND WHAT THEY HEAR.

**DIRECTIONS FOR USE**

The PICA-III-R includes the pictorial cards, an instruction manual, and a score sheet (which comprises a timeline for past and present history). It is administered in a one-to-one format by a clinician familiar with psychiatric diagnoses in childhood and with *DSM* classification. After collecting the demographic data, the examiner introduces the instrument to the child by presenting successively 4 initial pictures of common situations, designed only as training trials. The same question, "How much are you like him/her?" is asked for each picture. The child is introduced to a visual analog rating scale to be used throughout the interview. This 5-point rating scale (Fig. 6) relies on the children's natural way of expressing quantities, i.e., showing with their hands how much they mean. During the interview, children are directed to point to the quantity that best represents their thinking. It is important to stress to the child that there is no right or wrong, or good or bad answer. Support should be given to the child between items and not while the child is looking at a picture.
As illustrated in Figures 1 through 5, each picture is accompanied by a set of comments and questions provided for the interviewer to help children understand the drawings and rate themselves. These questions are compiled in the instruction manual. The examiner can supply additional explanations if the child seems to have difficulty with the content of the pictures. Once the picture is understood, the next questions probe the severity of the symptom, frequency of occurrence, and period of time when the symptom was present. The answer to the "How much" question is rated on the 5-point visual analog scale (1 = just a little and 5 = very much). A score of 2 or greater is considered positive. Answers are noted on the score sheet, which requires both "present" and "past" to be recorded and includes extra space for remarks.

The children's reactions to and comments about the pictures are extremely useful. The child who experiences the symptom depicted in a picture, for example, "hearing voices," will be likely to recognize it right away without prompts from the experimenter. Comments such as "This is just like me when..." have been noted. Also, much like in projective tests, the child can evidence unusual concerns and thinking processes, for example, "He refuses to eat because they want to poison him" or "She is sad and tomorrow she is going to the movies." These remarks should be recorded and used appropriately.

Two strategies are suggested to help children decide on their answers. The first one consists of asking children to compare themselves with their peers (e.g., "Are you like this more than other kids your age?"). Alternatively, children are asked how other people who know them well would answer the question (e.g., "What would your teacher say?").

It is critical to identify the period of time when the symptoms were present and their duration. As is done in other psychiatric interviews, significant events such as birthdays, holidays, and important personal or familial changes are used to anchor a timeline to which the examiner can refer with the child. One caveat in semistructured interviews is examiner error. However, the
requirement that the examiner be an experienced clinician reduces this type of error. Indeed, the experienced clinician can clarify the pictures not understood by the child, as well as the ambiguous answers given by the child. It is incumbent on the clinician to encourage and support the child in a neutral way to avoid biased answers.

**EASE OF ADMINISTRATION**

The length of administration of the PICA-III-R varies from one child to the other. It ranges on average between 40 and 60 minutes. Of the 52 children (6-15 years old) who were tested, only 1 child (5.5 years old) could not comply with the testing procedure because of extreme hyperactivity and oppositional behavior (Ernst et al., 1994). So far, the PICA-III-R has been used only with severely disturbed inpatient children. It is expected that its use in the less severely impaired outpatient population will be even easier.

**PSYCHOMETRIC PROPERTIES**

As mentioned above, the PICA-III-R has been validated in 51 inpatient children in an initial study that offers sufficient promise to further work on robustness. A research child and adolescent psychiatrist, blind to the clinical diagnoses of the children, administered the PICA-III-R and recorded the PICA-III-R-derived psychiatric diagnoses. At the end of the study, the diagnoses from the pictorial interview were compared with the clinical diagnoses made by an independent child and adolescent psychiatrist, a staff member of the inpatient unit not involved in the research study. As is the rule in child and adolescent psychiatry, clinical diagnoses were determined after clinical interviews of the child and the parents and collection of information from school. No other structured interviews were used.

Replication as well as further validation in different populations (e.g., outpatients) and against standard instruments is needed. The initial study reports on (1) independence of subscales, (2) internal validity, (3) diagnostic discriminative power, and (4) sensitivity to changes.

The Cronbach \([\alpha]\) (coefficient \([\alpha]\)) was used to determine the internal reliability of the PICA-III-R. Internal consistency was excellent for the Psychotic Disorder \((\alpha = .86)\), Anxiety \((\alpha = .85)\), Depression \((\alpha = .84)\), Oppositional Defiant Disorder/Conduct Disorder (ODD/CD) \((\alpha = .84)\), and Attention-Deficit Hyperactivity Disorder (ADHD) \((\alpha = .80)\) subscales; it was moderate for the Mania subscale \((\alpha = .69)\) and marginal for the Obsessive-Compulsive Disorder (OCD) subscale \((\alpha = .54)\).

The independence of the content and ratings of the subscales, measured by inter-subscale correlations, was quite acceptable. Most subscales (15 of 21 correlations) showed little overlap \((r = 0.01\text{-}0.36)\). The largest correlations \((r > 0.40)\) occurred between the Anxiety and OCD subscales \((r = 0.51)\), the Anxiety and Depression subscales \((r = 0.55)\), the Psychotic Disorder and Depression subscales \((r = 0.45)\), the Depression and OCD subscales \((r = 0.43)\), the ADHD and Mania subscales \((r = 0.43)\), and the ADHD and ODD/CD subscales \((r = 0.42)\). These overlaps likely reflected the presence of comorbidity or of shared symptoms among different disorders. For example, the schizophrenia group scored high on the ADHD subscale, probably because of the well-known presence of concentration deficit, distractibility, impulsivity, and agitation in the clinical presentation of schizophrenia (Landre and Taylor, 1995).
As a measure of discriminant validity, the diagnostic power of the PICA-III-R was assessed. A canonical discriminant function analysis was used for this purpose, and the 3 subscales with the highest internal reliabilities and greatest clinical relevance to the study sample (Depression, Psychotic Disorder, and ODD/CD) were entered in the analysis. The instrument significantly discriminated among these diagnostic groups (Wilks $\lambda = 0.67, p < .02$).

Validity was also measured by looking at the sensitivity of the instrument over time. Severity scores were compared at the beginning of hospitalization and before discharge. A change in the PICA-III-R scores was expected to reflect clinical improvement, which is a criterion for discharge. Fifteen children were retested at discharge: 7 with CD, 5 with schizophrenia, 2 with mood disorder, and 1 with psychotic disorder not otherwise specified. The mean scores for all subscales significantly decreased ($p$ values ranged from 0.046 to 0.004) with the exception of the Mania, OCD, and ADHD subscales.

NONVERBAL AND PICTORIAL INSTRUMENTS

At present, classical nonverbal psychiatric instruments used in children, such as projective tests (e.g., the Rorschach Inkblot Test or the Thematic Apperception Test), are widely used to evaluate internal conflicts or personality structures. Other instruments, such as the Peabody Picture Vocabulary Test or the Raven Progressive Matrices, assess cognitive function. To our knowledge, there are 4 instruments comparable with the PICA-III-R: the Pictorial Scale of Perceived Competence and Social Acceptance (Harter and Pike, 1984), the Preschool Symptom Self-Report (Martini et al., 1990), the Levonn (Martinez and Richters, 1993), and the Dominic Questionnaire (Valla et al., 1994) (see elsewhere in this section). The PICA-III-R is the most comprehensive interview with respect to psychiatric diagnoses. The Dominic is the pictorial instrument most similar to the PICA-III-R. Like the PICA-III-R, it addresses DSM-III-R criteria; yet this instrument covers only 7 diagnoses and does not provide a severity index for each item. Moreover, in contrast to the PICA-III-R, administration of the Dominic Questionnaire is supposed not to require clinical expertise. While this lack of clinical expertise may imply easier use, it does not necessarily imply better diagnostic evaluation. The Preschool Symptom Self-Report is a pictorial instrument designed to elicit self-reports of depressive symptoms in preschool children. This instrument has been studied only in a preschool population and may be improved by including an analog scale as suggested by the authors (Martini et al., 1990). Based on Valla and colleagues’ (1994) original work on the Dominic Questionnaire, the Levonn (Martinez and Richters, 1993) is a pictorial instrument that includes pictures of symptoms of post-traumatic stress disorder along with a picture of a thermometer filled with different degrees of mercury depicting the severity of the symptom. Finally, the Pictorial Scale of Perceived Competence and Social Acceptance targets the 4 domains of cognitive competence, physical competence, peer acceptance, and maternal acceptance. The characteristics of these instruments are contrasted in Table 1.
TABLE 1 Characteristics of Pictorial Instruments

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<tr>
<td>Age range</td>
<td>4–7 years</td>
<td>6–16 years</td>
<td>3–4 years</td>
<td>6–10 years</td>
<td>6–11 years</td>
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<tr>
<td>Diagnoses</td>
<td>Perceived competence</td>
<td>ADHD, AGOR, AvD, CD, Ma, MDD, OAD, OCD, ODD, PD, SAD, SPh</td>
<td>Depression</td>
<td>Distress symptoms</td>
<td>ADHD, CD, MDD, OAD, ODD, SAD, SPh</td>
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<td></td>
<td>and social acceptance</td>
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<td>Format</td>
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<tr>
<td>Administration length</td>
<td>—</td>
<td>40–60</td>
<td>15 minutes</td>
<td>15–20 minutes</td>
<td>Lay interviewers</td>
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<td>Examiner requirements</td>
<td>Lay interviewers</td>
<td>Clinicians (M.A., Ph.D., M.D.)</td>
<td>Lay interviewers</td>
<td>Lay interviewers</td>
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<tr>
<td>Test-retest reliability</td>
<td>ICC = 0.86</td>
<td>r = 0.81</td>
<td>α = 0.90</td>
<td>α = 0.62–0.88</td>
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<tr>
<td>Reliability (internal consistency)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>α = 0.75–0.89</td>
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Note: PSPCSA = Pictorial Scale of Perceived Competence and Social Acceptance; PICA-III-R = Pictorial Instrument for Child and Adolescent Psychiatry; PRESS = Preschool Symptom Self-Report; ADHD = attention-deficit hyperactivity disorder; AGOR = agoraphobia; AvD = avoidant disorder; CD = conduct disorder; Ma = mania; MDD = major depressive disorder; OAD = overanxious disorder; OCD = obsessive-compulsive disorder; ODD = oppositional defiant disorder; PD = psychotic disorder; SAD = separation anxiety disorder; SPh = simple phobia; ICC = intraclass correlation coefficient.

<sup>a</sup> Not found.
<sup>b</sup> α = Cronbach α coefficient.

PSYCHIATRIC INTERVIEWS FOR CHILDREN

As already mentioned, the development of the PICA-III-R was an attempt to overcome some of the inherent limitations associated with standard psychiatric interviews of the child-structured interviews such as the Diagnostic Interview Schedule for Children (DISC) (Costello et al., 1985) and the Child and Adolescent Psychiatric Assessment (Angold et al., 1995) or semistructured interviews such as the Schedule for Affective Disorders and Schizophrenia for School-Age Children (Puig-Antich and Chambers, 1978), the Diagnostic Interview for Children and Adolescents (DICA) (Reich et al., 1982), and the Interview Schedule for Children (Dencik, 1994; Kovacs, 1985). Pictorial instruments add a new dimension to the psychiatric interview that is developmentally appropriate and greatly improves patient participation. Moreover, the pictorial style may facilitate good rapport, thereby improving the quality of information given by the child. Younger children (6-12 years of age) have been reported to perform worse than older children (12-18 years of age) (Schwab-Stone et al., 1994; Weinstein et al., 1989). Suggestive of the quality of the child interview, mother-child agreement on the DICA was reported to be worse in the 6- to 9-year-old age group than in the 10- to 11- and 12- to 16-year-old groups (Reich et al., 1982). Whereas mothers report more behavioral symptoms, children tend to report more subjective symptoms (Herjanic and Reich, 1997). In another study, the reliability of the DISC as a function of age was examined by Edelbrock et al. (1985). The response patterns in children aged 6 to 9 years were less reliable on all subscales than those in adolescents aged 14 to 18 years, especially with respect to obsessive-compulsive, schizoid, psychotic, and manic symptoms. The authors suggested that younger children lack the "self-awareness, perspective taking, recall, reasoning ability, and expressive skills" (p. 273) necessary for these interviews.

In a review article, Gutterman et al. (1987) concluded that limitations of current child and adolescent interviews arise from the fact that their format is modeled after adult interviews. Despite efforts to integrate the cognitive and affective developmental stages of children, the concepts and wording of some of the questions remain confusing. In addition, children have difficulty describing their inner states (Breslau, 1987; Young et al., 1987). The length of most psychiatric
interviews (1-2 hours) exceeds that of the attention span of children (Rebok et al., 1997), which makes it impossible for the child to stay focused throughout the interview. Finally, because recognition memory is usually better than recall memory (Kagan, 1984), the use of visual cues that trigger recognition memory is likely to enhance the reliability and validity of the information given by the child.

**CONCLUSION**

The PICA-III-R (Ernst et al., 1994) can be used as an alternative approach to overcome some of the inherent limitations associated with standard psychiatric interviews. Although it needs to be modified to follow DSM-IV criteria, the PICA-III-R can be of significant help to child and adolescent psychiatrists, for clinical as well as research diagnostic purposes. It provides a categorical (diagnosis present or absent) and dimensional (range of severity) evaluation of childhood psychopathology. Replication as well as further validation in both same and different populations (e.g., outpatients) and against standard instruments is needed for general clinical use. In addition, the children's reactions to and comments about the pictures are extremely useful. Therefore, it is suggested that projective answers should be also studied systematically, especially as those are more likely to be subject to interviewer bias/error. Overall, the ease of administration and the developmentally based approach to collect information make the PICA-III-R a potentially effective instrument to use for the assessment of psychiatric diagnosis in children aged 6 to 16 years.

**USER INFORMATION**

The PICA-III-R may be obtained free of cost from the first author. Written requests may be addressed to Dr. Ernst, NIDA, Brain Imaging Center, 5500 Nathan Shock Drive, Baltimore, MD 21224 or sent by e-mail to mernst@intra.nida.nih.gov. As mentioned above, only clinicians with psychiatric training should administer the instrument.

**REFERENCES**


Key Words: diagnosis; conduct disorder; childhood psychosis; depression; visual analog scale

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