The Child Assessment Schedule (CAS) Diagnostic Interview: A Report on Reliability and Validity

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This paper describes data relevant to the reliability and validity of the Child Assessment Schedule (CAS). The CAS, a diagnostic instrument for children, was designed for clinical assessment as well as collection of research data. Information relevant to making a differential diagnosis is solicited within a format of standardized questions and response items. Two independent reliability studies have been conducted with a total of 63 children. Interrater reliability for the total CAS score was found to be high in both studies (0.91 and 0.90). High interrater reliability was also demonstrated for subscales of the CAS. Data relevant to the concurrent validity of the CAS are also presented.

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There is growing recognition that a standardized diagnostic interview for children is needed. Use of such an instrument would permit comparison of results across studies and enhance research in the area of child psychopathology. However, there is no consensus about what constitutes a good diagnostic interview for children. Numerous instruments have been developed to rate the behavior and responses of children during an interview. However, some provide only standardized response items (e.g., Guy, 1976). Other instruments provide a suggested line of questioning to aid the examiner, but there is no attempt to standardize the presentation of the interview (e.g., Kestenbaum and Bird, 1978). The instruments which do provide a standard set of questions with corresponding response items tend to be lengthy, use language not easily understood by children, ask questions which require sophisticated judgments about their symptoms, and expect the children to have an understanding of time (i.e., past history) which may be beyond their abilities (Chambers et al., 1978; Herjanic et al., 1975).

The Child Assessment Schedule (CAS) was developed by Hodges et al. (1981) to address the need for a diagnostic interview which is appropriate for children. The CAS has questions and responses that are standardized, and the format was designed to facilitate the development of a good rapport with the child. In addition, questions and response items were chosen such that information which is relevant to making a diagnosis according to DSM-III is obtained from the child. The CAS provides a systematic and comprehensive method for obtaining information that is useful in clinical assessment, in training novice clinicians, and in conducting research. The purpose of this paper is to present data relevant to the reliability and validity of the instrument.

The interview consists of two parts. In the first part, the child is asked a series of approximately 75 questions about several topics including: school, friends, activities and hobbies, family, fears, worries, self image, mood (especially sadness), somatic concerns, expression of anger, and thought disorder symptomatology. The examiner marks the response item which corresponds to the child's answer. The second part of the CAS provides a format for the interviewer to record observations and judgments after the completion of the interview. There are approximately 53 items in this section which inquire about the following areas: insight, grooming, motor coordination, activity level (including attention span and impulsivity), other spontaneous physical behaviors, estimate of cognitive ability, quality of verbal communications (speech and logic of thought), quality of emotional expression, and impressions about quality of interpersonal interactions. The interview takes approximately 45 min to 1 hour to administer. Excerpts of both parts of the interview are presented in table 1. When the interview is administered by an experienced clinician who is thoroughly familiar with the interview, the child gen-

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TABLE 1

Example Items from CAS

Example from Part I

Questions	Response Items	Response Categories				
		No (False)	Yes (True)	Ambiguous	No Response	Not Applicable
Sample from "Fears and Anxieties"						
Most people are afraid of something: What are you afraid of? Does this fear keep you from doing anything?	Indicates s/he had fears which are excessive.	____	____	____	____	____
	If true: check all that apply					
	a. Indicates that fears keep him/her from performing adequately.	____	____	____	____	____
	b. Fear is of a bizarre nature (i.e., does not reflect age-appropriate reality testing).	____	____	____	____	____
	c. Fears are associated with a panic attack.	____	____	____	____	____
Sometimes kids have nervous or jumpy feelings. Do you have these kinds of feelings a little, a medium amount, or a lot of the time?	Indicates anxiety a lot of the time.	____	____	____	____	____
	Check here if anxiety is characterized by any of the following:					
(If child indicates presence of a lot of anxiety, ask:) Can you describe what your anxious feelings are about?	a. Chronic worry about the future (anticipatory anxiety).	____	____	____	____	____
	b. Worry about being perfect.	____	____	____	____	____
	c. Precocious concerns.	____	____	____	____	____
Sample from "Mood and Behavior"						
When you are sad, do you feel like things will work out or do you feel like they are hopeless?	Does not feel things will work out.	____	____	____	____	____
Do you feel lonely a little, a medium amount or a lot of the time.	Indicates feels lonely a lot of the time.	____	____	____	____	____
How much do you cry? (every day, many days, once in a while)	Cries often and/or most of the time.	____	____	____	____	____
Sometimes children think about death? Do you think about death?	Thinks about death often (preoccupied).	____	____	____	____	____
Do you ever think of hurting yourself, (if yes ask:) Even killing yourself?	Has thought of hurting himself.	____	____	____	____	____
	Has thought of committing suicide.	____	____	____	____	____
	Has talked to someone about hurting or killing self.	____	____	____	____	____
(If yes ask:) Did you even think of how you would do it?	Can specify a method.	____	____	____	____	____
(If yes ask:) Did you ever try to hurt or kill yourself?	Has actually tried to hurt or kill self.	____	____	____	____	____
Have you ever done things carelessly, as if you didn't care whether you hurt yourself?	Reports a type of carelessness which suggests an underlying desire to hurt self.	____	____	____	____	____
Sample from "Expression of Anger"						
How often do you have trouble controlling your temper?	Often has difficulty controlling temper.	____	____	____	____	____
Do you have trouble following rules at school?	Admits has considerable trouble following the rules at school or home (more than typical).	____	____	____	____	____
How about at home?	a. School	____	____	____	____	____
	b. Home	____	____	____	____	____

TABLE 1—*Continued*

Questions	Response Items	Response Categories				
		No (False)	Yes (True)	Ambiguous	No Response	Not Applicable
Example from Part I						
(If yes, ask:) Have you ever been thought of as a troublemaker?	Has been thought of as a troublemaker.	____	____	____	____	____
	If true: Check all that apply to reason for being seen as a troublemaker:					
	a. Verbal fighting, no physical agressiveness.	____	____	____	____	____
	b. Physical violence against persons (e.g., rape, mugging, assault).	____	____	____	____	____
	c. Physical violence against property (e.g., vandalism, breaking and entering, fire-setting).	____	____	____	____	____
	d. Thefts involving confrontation (e.g., extortion, purse-snatching, robbery).	____	____	____	____	____
	e. Running away from home overnight.	____	____	____	____	____
	f. Persistent/chronic lying.	____	____	____	____	____
	g. Stealing where confrontation with victim does not take place.	____	____	____	____	____
	h. Truancy.	____	____	____	____	____
	i. Traffic violations for reckless driving.	____	____	____	____	____
Have you ever had to see the police?	Indicates having had contact with the police.	____	____	____	____	____
Have you ever had to see the principal?	Indicates having had contact with the principal.	____	____	____	____	____
Example from Part II						
Impressions about quality of interpersonal interactions	Difficulty separating from parental figure or attachment figure.	____	____	____	____	____
	Stubborn, oppositional.	____	____	____	____	____
	Argumentative, belligerent, provocative.	____	____	____	____	____
	Quality of rapport seems superficial (e.g., not interested in rapport).	____	____	____	____	____
	Appears to lack concern for feelings of others, including lack of appropriate guilt and remorse.	____	____	____	____	____
	Appears manipulative and exploitative (e.g., does not extend self for others unless there is obvious immediate advantage to him/her).	____	____	____	____	____
	Excessively conforming or approval-seeking.	____	____	____	____	____
	Difficulty in establishing rapport and seems to be due to shyness as opposed to: hostility, avoidance of specific issues, or thought disorder.	____	____	____	____	____

TABLE 1—*Continued*

Example from Part II

Questions	Response Items	Response Categories				
		No (False)	Yes (True)	Ambiguous	No Response	Not Applicable
	Quality of rapport is superficial, secondary to serious impairment in relating interpersonally ("feel like there is a wall between you and your patient").	———	———	———	———	———

erally experiences the interview as an open-ended discussion about various areas of his/her life. The interview is presented in detail, including instructions for administration and interpretation, in Hodges et al. (1981).[1]

The CAS is intended to be primarily a clinical tool that is qualitatively analyzed by the clinician. The scoring format has been designed so that all affirmative responses indicate problems or symptoms. For each response item, the child's response is coded as either true (presence of symptom), false (absence of symptom), ambiguous response (e.g. "sometimes"), no response from the child, or not applicable. For later reference, interviewers often supplement the scoring with comments on the content of the child's responses and notes on clinical impressions.

Once coded, the child's responses can be reviewed from two major perspectives. The first is the content area of dysfunction, such as school, friends, family, etc., which is reflected by the number of items endorsed for each of the various topic areas covered in the interview. Second, a diagnostic impression can also be derived since questions and response items were chosen to inquire specifically about the DSM-III diagnostic criteria. The clinician can review the child's responses for the interview items indexed as relevant to various diagnoses. Of course in clinical practice the child's responses on the CAS are only one of the sources of information used in making a diagnostic formulation. Information from significant others (e.g., parents, teachers) and the developmental history of the child are always considered. However, for research purposes, scores can be derived to permit comparison of groups on: total pathology score, content area scale scores, and symptom complex scale scores. These scores have been used in studies designed to assess the reliability and validity of the CAS.

Reliability Studies

There have been two reliability studies which have been independently conducted in different research settings. The first was conducted at Missouri with a child psychiatric population (Hodges et al., 1982) and the second at the NIMH with offspring of normal and affectively disturbed mothers.

Child Psychiatric Sample

Interviews with 53 children were videotaped, including 22 outpatients, 12 inpatients, and 19 normal controls. The psychiatric subjects were consecutive referrals to a children's unit of a mental health center and the controls were recruited from two local Girl Scout and two local Boy Scout troops. The mean age for each of the groups was 10 years.

The children were administered the CAS by two experienced interviewers, the first author (K.H.) and a psychology intern. The raters were the two interviewers and two first-year graduate students who were not clinically trained. The two graduate students scored only from the videotapes, using the same criteria as the interviewers. Ratings were done independently. Interviews were videotaped through a one way mirror with the informed consent of the child and parent.

Scores were derived for total pathology, the 11 content areas, and the 9 symptom complexes. The mean correlation for all raters for total CAS score was $r = 0.90$. The mean correlations for the content areas and symptom complexes were lower than for the total score, but most had a satisfactory agreement of at least 0.70. These included all the content areas except Fears and Worries. The symptom complexes which did not meet this criteria for interrater reliability included: Overanxious Disorder, Separation Anxiety, Attention Deficit Without Hyperactivity, and Socialized Conduct Disorder (Hodges et al., 1982). These scales were reviewed and modifications in the questions and response items were made. This revised version of the interview was used in the second study at NIMH.

NIMH Study

Subjects included 10 latency age children of affectively disturbed and normal mothers. Informed consent was obtained for all subjects. Two raters inde-

[1] A copy of the final version of the interview can be obtained from the *Catalog of Selected Documents in Psychology* (manuscript number 2303), American Psychological Association, 1200 17th St., N.W., Washington, DC 20036.

pendently scored the child's responses, using a one-way mirror.

The mean scoring agreement based on an item by item comparison for all response categories was 0.91. The range of the interrater scoring agreement for all subjects was 0.87 to 0.96. Item by item scoring agreement was also determined for each of the content scales and symptom complex scales. These results are presented in table 2. For the content areas the interrater reliability ranged from 0.86 to 0.98, with an average of 0.93 across all content areas. For the symptom complexes, the range was 0.89 to 0.97 with a mean scoring agreement of 0.93.

Validity Study

A validity study has been completed with the child psychiatry sample at Missouri (Hodges et al., 1982). For the NIMH study, the collection of data relevant to validity is still in progress. Subjects in the child psychiatric sample included those in the reliability study plus an additional 34 subjects. The sample consisted of 32 psychiatric outpatients, 18 psychiatric inpatients, and 37 normal controls. The psychiatric patients were all consecutive referrals. After a sufficient sample of videotaped interviews had been obtained for assessing reliability, new patients were administered the CAS but were not videotaped. The children were also given the Children's Depression Inventory (CDI) (Kovacs, 1978) and the State-Trait Anxiety Inventory for Children (STAIC) (Spielberger, 1973). The parents completed the Child Behavior Checklist (CBC) (Achenbach, 1978; Achenbach and Edelbrock, 1979).

TABLE 2

Item by Item Percent Scoring Agreement between Raters for CAS Variables

Variable	Scoring Agreement
All CAS response items	0.91
Content Areas[a]	
School	0.94
Friends	0.97
Activities	0.96
Family	0.97
Fears	0.98
Worries	0.93
Self-Image	0.92
Mood	0.90
Somatic Concerns	0.94
Expression of Anger	0.86
Observational Judgments by Interviewer	0.90
Symptom Complexes	
Attention Deficit With Hyperactivity	0.89
Attention Deficit Without Hyperactivity	0.89
Undersocialized Conduct Disorder—Aggressive	0.94
Undersocialized Conduct Disorder—Nonaggressive	0.96
Socialized Conduct Disorder—Aggressive	0.97
Socialized Conduct Disorder—Nonaggressive	0.96
Separation Anxiety	0.94
Overanxious	0.91
Oppositional	0.94
Depression	0.92

[a] Scoring agreement was not computed for Thought Disorder Symptomatology scale. None of the children had symptoms on this scale, as judged by both raters.

The three groups differed significantly on total CAS score indicating degree of psychopathology, on 9 out of 11 content areas, and on 8 out of 9 symptom complexes. The only scores on which the groups were not significantly different were: the Fears and Worries content areas and the Attention Deficit Without Hyperactivity Symptom Complex. In addition, the psychiatric inpatients scored significantly higher than outpatients, who in turn scored significantly higher than controls, on content area and symptom complex scales assessing behaviors which pose severe management difficulties (i.e., Expression of Anger, Undersocialized Conduct Disorder—Aggressive Type, Oppositional Disorder and Attention Deficit with Hyperactivity).

To assess concurrent validity, the CAS total pathology score and selected symptom complex scores were correlated with relevant scores on the other three instruments administered. High agreement was found between the CAS total pathology score and maternal report of child pathology on the CBC: number of problems ($r(81) = 0.53$, $p < 0.001$) and severity of problems ($r(81) = 0.57$, $p < 0.001$). This relationship is very supportive of the validity of the CAS since both the CAS and the CBC attempt to assess overall degree of pathology. Significant correlations were also found between the Overanxious symptom complex score on the CAS and the STAIC ($r(75) = 0.53$, $p < 0.001$) and between the Depression symptom complex and the CDI ($r(77) = 0.53$, $p < 0.001$).

Discussion

The results of these studies demonstrated substantial evidence of interrater reliability and encouraging data regarding the clinical validity of the CAS. The CAS was originally developed from a clinical interview designed for children. The questions tend to be open-ended, are clinically subtle as well as informative, and are grouped by natural topics of conversation (e.g. school, friends). These characteristics probably enhance the quality and validity of the information given by the child. The response items were later developed to permit quantification for research purposes. The CAS has been clinically used since 1978 and undergone numerous revisions based on feedback from administering to children. Additionally, modifications were made so that the questions and response items would

render specific information needed in making a differential diagnosis based on the DSM-III criteria. The response items used by the rater are highly specific and descriptive and items constituting the various diagnostic categories are noted. The CAS represents a traditional child clinical interview which has been refined to facilitate use for research and for training purposes.

There is substantial evidence of interrater reliability. The CAS has been field tested in two independent research settings. The mean correlation between raters for total CAS score was 0.90 in the Missouri study and 0.91 for item by item comparison in the NIMH study. High interrater reliability has also been demonstrated for the symptom complex and content area scales. Also, these high levels of interrater reliability have been obtained for both very experienced and less experienced mental health workers. The interviewers have always been highly trained child clinicians, which facilitates eliciting unambiguous responses from the child. However, the raters have included both experienced professionals as well as research assistants who have been trained in how to score the CAS but are not experienced professionals.

These results also provide preliminary evidence of the concurrent validity of the CAS. The CAS scores differentiated the three groups of children whom differed in levels of pathology. Scores on the CAS also corresponded to parental report of psychiatric disturbance as assessed by another measure and to the child's self report as assessed by written questionnaires. The CAS symptom complex scores made further discriminations between the psychiatric inpatients and outpatients in areas of functioning which were consistent with the known characteristics of the groups. These results suggest that further assessment of validity is merited. Additional research needs to be conducted in the area of discriminant validity to determine whether the CAS can differentiate children with various disorders, including children with a thought disorder. Other studies examining the correspondence between the CAS and clinical history of the child or treatment outcome would also provide helpful information on how the CAS can be validly used.

The preliminary evidence relevant to the psychometric qualities of the CAS indicates that it has sufficient reliability to permit its use in research as well as clinical settings. There is also preliminary evidence of validity, even though more work needs to be done in this area. The CAS is practical and can be used easily in clinical settings as well as in research being conducted in the area of child psychopathology.

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