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Authors Shaffer, D., Fisher, P., Lucas, C.P., Dulcan, M.K., Schwab-Stone, M.E.

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NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV): Description, Differences From Previous Versions, and Reliability of Some Common Diagnoses

DAVID SHAFFER, F.R.C.PSYCH.(LOND.), PRUDENCE FISHER, M.S., CHRISTOPHER P. LUCAS, M.D.,
MINA K. DULCAN, M.D., AND MARY E. SCHWAB-STONE, M.D.

ABSTRACT

Objective: To describe the National Institute of Mental Health Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV) and how it differs from earlier versions of the interview. The NIMH DISC-IV is a highly structured diagnostic interview, designed to assess more than 30 psychiatric disorders occurring in children and adolescents, and can be administered by "lay" interviewers after a minimal training period. The interview is available in both English and Spanish versions. **Method:** An editorial board was established in 1992 to guide DISC development and ensure that a standard version of the instrument is maintained. Preliminary reliability and acceptability results of the NIMH DISC-IV in a clinical sample of 84 parents and 82 children (aged 9–17 years) drawn from outpatient child and adolescent psychiatric clinics at 3 sites are presented. Results of the previous version in a community sample are reviewed. **Results:** Despite its greater length and complexity, the NIMH DISC-IV compares favorably with earlier versions. Alternative versions of the interview are in development (the Present State DISC, the Teacher DISC, the Quick DISC, the Voice DISC). **Conclusions:** The NIMH DISC is an acceptable, inexpensive, and convenient instrument for ascertaining a comprehensive range of child and adolescent diagnoses. *J. Am. Acad. Child Adolesc. Psychiatry*, 2000, 39(1):28–38. **Key Words:** diagnostic interview, Diagnostic Interview Schedule for Children, measurement.

The Diagnostic Interview Schedule for Children (DISC) is a highly structured diagnostic instrument designed for use by nonclinicians. The instrument has been in devel-

opment since 1979, and various versions have been produced to match different classification systems. The current version of the DISC (National Institute of Mental Health [NIMH] DISC-IV), based on the *DSM-IV* and *ICD-10*, was released for field use in 1997.

Although originally intended for large-scale epidemiological surveys of children, versions of the DISC have been used in clinical studies, in prevention/screening exercises, and as an aid to diagnosis in service settings (e.g., Hinshaw et al., 1997; Shaffer et al., 1998; and P. Friman, 1999; L. MacDonald, 1998; L. Mufson, 1998; J. Weisz, 1998; C. Willis, 1997, personal communications).

CHANGING SHAPE OF THE NIMH DISC DISC-1

The impetus for developing the NIMH DISC was a 1979 initiative by the NIMH Division of Biometry and Epidemiology that called for an instrument similar to the Diagnostic Interview Schedule (Robins et al., 1981) to be used for large-scale surveys to determine the prevalence of

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From the Division of Child and Adolescent Psychiatry, Columbia University, New York, and the New York State Psychiatric Institute (Drs. Shaffer and Lucas, Ms. Fisher); Department of Psychiatry and Behavioral Sciences, Northwestern University, Chicago (Dr. Dulcan); and Yale Child Study Center, New Haven, CT (Dr. Schwab-Stone).

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Reprint requests to Dr. Shaffer, Department of Child and Adolescent Psychiatry, Columbia University/New York State Psychiatric Institute, 1051 Riverside Drive, New York, NY 10032; e-mail: shafferd@child.cpmc.columbia.edu.

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mental disorders and related service needs for children in the United States. Its content and structure were originally outlined by an NIMH committee convened in 1980 that included Keith Conners, Ph.D., Barbara Herjanic, M.D., and Joaquim Puig-Antich, M.D. In 1981, Anthony Costello, M.D., and colleagues at Western Psychiatric Institute undertook an extensive revision (DISC-1) of the prototype that was then field-tested in a clinical sample (Costello et al., 1984).

The DISC-1 differed from its successors in the following ways: it was tied to *DSM-III*; much of the interview was organized by environmental domains (e.g., school) rather than diagnostic ones; it included a number of "write-ins" (coded after the interview) that described a symptom in the respondent's words; and the severity required to define a behavior or feeling as pathological was generally low.

DISC-R

In the first revision of the DISC, unreliable questions identified from the DISC-1 field-trial data and questions with implausibly high prevalence in an unreferral population were rewritten (Shaffer et al., 1993). Extensive consultation was conducted with DISC users across the country about how best to reword "problem" questions, and the revised questions comprised the DISC-R. Notable changes from the DISC-1 included a reduction in the number of open-ended questions, the deletion of disorders that required observation or special tests, and the addition of a graphic "timeline" to identify important time frames. Field trials were conducted with the DISC-R on a clinical population (Piacentini et al., 1993; Schwab-Stone et al., 1993; Shaffer et al., 1993).

DISC-2

Findings from the DISC-R trial led to the *DSM-III-R*-compatible DISC-2.1 that appeared in 1989. That instrument had a modular organization; assessed age at first episode, impairment associated with the current episode, precipitating stresses suggestive of an adjustment disorder, and treatment history; and again revised unreliable questions from the DISC-R field trial. The DISC-2.1 was field-tested on a clinical sample of 97 children and adolescents and a community sample of 278 children and adolescents aged 9 to 17 years and their parents in the multisite Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) study (funded by the NIMH under the "Cooperative Agreement for Methodologic Research for Multi-Site Epidemiologic Surveys of Mental

Disorders in Child and Adolescent Populations"; see Lahey et al., 1996) (Jensen et al., 1995).

The DISC-2.3 (1991), a refinement of the DISC-2.1, was developed by Shaffer and colleagues in collaboration with the Diagnostic Committee from the MECA study. Once again, items that had been unreliable or overly prevalent in the DISC-2.1 field trial were revised, and very long questions were shortened. A scoring algorithm was constructed that permitted a diagnosis to be established based either on symptom criteria alone or symptom criteria and a minimum level of diagnosis-specific impairment. A Spanish-language version of the DISC-2.3 was prepared and used at the Puerto Rico site of the MECA study (Bravo et al., 1993), as well as for Spanish subjects at the Yale and Columbia sites.

The DISC-2.3 was the first DISC that was widely administered using computer-assist software. Two versions were available: the PC DISC, programmed at Emory University for use in the MECA study for both the English and Spanish versions of the interview; and the C-DISC-2.3, programmed by Arthur Blouin, Ph.D., and colleagues at Ottawa Civic Hospital in Canada with assistance from the Division of Child Psychiatry at Columbia University/New York State Psychiatric Institute for the English version only.

DESCRIPTION OF THE NIMH DISC-IV

The NIMH DISC-IV revised DISC-2.3 on the basis of MECA field-trial data and was designed to address more than 30 psychiatric diagnoses that occur in children and adolescents (Table 1) using *DSM-IV* (American Psychiatric Association, 1994) and *ICD-10* (World Health Organization, 1993) criteria. In addition to modifying previously unreliable questions, the NIMH DISC-IV included a number of new features, including the introduction of some diagnostic sections that were compatible with interviews used in adults, specifically, the schizophrenia section, derived from questions from the Composite International Diagnostic Interview, Version 2.0 (World Health Organization, 1995), and the substance use section, with questions from the Diagnostic Interview Schedule, Version IV (Robins et al., 1996). This compatibility allows investigators using the DISC to compare their findings with those of other investigators.

Parent/Youth Versions

There are parallel versions of the instrument: the DISC-P for parents (or knowledgeable caretakers) of 6- to 17-

TABLE 1
NIMH DISC Characteristics

Highly structured diagnostic instrument
 Designed for administration by lay interviewers after a brief training period
 Computer-assisted for ease of administration and scoring
 Age range: parents and youths aged 6–17 and youths aged 9–17

Parallel parent and youth versions
 DISC-Y (for direct administration to children or adolescents)
 DISC-P (for administration to parents or knowledgeable caretakers)
 Available in English and Spanish versions

Assesses >30 psychiatric diagnoses
 Anxiety disorders
 Social phobia, separation anxiety, specific phobia, panic, agoraphobia, generalized anxiety, selective mutism, obsessive-compulsive, posttraumatic stress
 Mood disorders
 Major depressive episode/dysthymia, manic/hypomanic episode
 Schizophrenia
 Disruptive behavior disorders
 ADHD, oppositional defiant, conduct
 Substance use disorders
 Alcohol abuse/dependence, nicotine dependence, marijuana abuse/dependence, other substance abuse/dependence
 Miscellaneous disorders
 Anorexia nervosa/bulimia nervosa, elimination disorders, tic disorders, pica, trichotillomania

Cost: Projects supported by DHHS (unlimited installations—\$2,000 license fee per project per DISC version and cost of diskette sets); nonfunded investigators and public health users (\$700/installation); students and educators (\$150/installation); clinical and commercial use (\$900/installation); all fees support access to technical support and program updates

Derivations of the NIMH DISC in development
 Present State DISC
 Voice DISC
 Quick DISC
 DISC Predictive Scales
 Young Adult DISC
 Teacher DISC

Note: NIMH DISC = National Institute of Mental Health Diagnostic Interview Schedule for Children Version IV; ADHD = attention-deficit/hyperactivity disorder; DHHS = Department of Health and Human Services.

year-olds, and the DISC-Y (for direct administration to children and youths aged 9–17 years). However, some investigators have used the DISC-P with parents of children as young as 4 and 5 (e.g., Frick et al., 1994) and the DISC-Y with youths older than 17 years (e.g., Shaffer et al., 1998). Information from these interviews can be combined or examined separately.

The DISC-P and DISC-Y cover the same range of behaviors and symptoms and incorporate parallel ques-

tions, though pronouns differ across versions. The DISC-Y would inquire about internal states, asking, "Did you feel ____?" while the question in the parent interview would read, "Did he seem ____?" or "Did he say that he felt ____?" A small number of questions in the parent interview are not included in the youth version.

Questions and Answers

Most questions in the NIMH DISC-IV are short and relatively simple. They typically contain no more than 2 concepts (e.g., a time period and a symptom description). Responses to DISC questions are mostly limited to yes and no, although some have an additional "sometimes" or "somewhat" response option or a close-ended frequency choice. Very few questions allow an open-ended response. As in all versions of the DISC, questions are read by the interviewer *exactly* as written.

The complete DISC contains just fewer than 3,000 questions: (1) There are 358 "stem" questions that are asked of every respondent. Stem questions describe the essential aspects of symptoms in broad terms and, by design, are overly sensitive and yield many false-positives. That is, most people who have the symptom would endorse the stem, but many who endorse it will turn out not to have the symptom. (2) There are almost 1,300 "contingent" questions that are asked if a stem or previous contingent question has been answered positively. Contingent questions are used to determine whether an endorsed stem symptom meets frequency, duration, and intensity criteria specified by *DSM* or *ICD*. Contingent questions improve the accuracy of the stem questions. An example of a stem/contingent question can be found in Table 2. Use of the stem/contingent structure allows the DISC to build symptom and criterion scales for most diagnoses. (3) There are 732 questions that ask about age of onset, impairment, and treatment for reported symptoms. These questions are asked only if a "clinically significant" number of diagnostic criteria have been endorsed—usually, half or more of those required for a diagnosis. (4) There are nearly 700 questions in the optional whole-life module that have a distinctive form (see below).

Organization

The DISC begins with an introductory module that includes demographic information (age, grade, names and ages of siblings, and identification of caretakers and "attachment figures"). This module also contains an informational component that teaches the respondents about

the scope of the interview, the format in which their answers are to be given, and what they should do if they have more to say than yes or no. Interspersed within the introduction are a series of questions given to respondents to ensure that they have understood the instructions and cues are given to the interviewer to provide further clarification if necessary.

Since the DISC measures diagnoses for different time periods (see below), it is very important that the respondent has a clear awareness of the time period covered by each question. Thus, the introductory module also includes an exercise in recall, in which the respondent completes a diagram of salient events that occurred in the past year that then serve as markers for the different time periods covered during the interview. They are referred to frequently to ensure that the respondent is focusing on the correct time period.

The remainder of the interview is organized into 6 modules, each containing related diagnoses (Anxiety, Mood, Disruptive, Substance Use, Schizophrenia, and Miscellaneous Disorders). Within these modules, each section queries all information needed to arrive at a particular diagnosis, i.e., they are "self-contained." This allows users to drop diagnostic sections without impacting the scoring of other included diagnoses. To achieve this modular approach, however, there are a few symptoms (e.g., irritability, restlessness, concentration problems) which, when the entire interview is administered, have to be queried

more than once. If at least half of the necessary criteria are endorsed, the interviewer inquires about age of onset, impairment from the symptoms, and receipt of or anticipated receipt of services. An elective, "whole-life" module (see below) is administered at the end of the core interview.

Time Frames

The NIMH DISC-IV assesses the presence of diagnoses occurring within both the past 12 months and the past 4 weeks. The longer time period covers a full school year, which is helpful in assessing disorders such as attention-deficit/hyperactivity disorder (ADHD) and separation anxiety disorder, is useful for studies that match diagnostic state and service utilization, and is valuable for risk-factor research. The shorter, 4-week period provides a measure of point prevalence that may be more accurately recalled and may be most relevant to clinicians.

The dual time frame is operationalized by first ascertaining whether a criterion has been met at any point within the past year. If not, no further inquiries are made. If it has, presence during the past 4 weeks is ascertained (Table 2).

The NIMH DISC-IV finishes with an optional "whole-life" module. Whole-life information is valuable for genetic and risk-factor studies. This module checks to determine whether diagnoses not present in the past year had occurred after age 5 and prior to the current year. The structure of the whole-life questions is different from the rest of the NIMH DISC-IV. Stem questions are longer and are phrased as descriptive vignettes to capture the essence of a particular disorder. For example, the vignette for agoraphobia reads as follows:

Since _____ (child's name) turned five years old, has there ever been a period of time when he would get really nervous or afraid or worried every time he was in a place where it would be hard to leave or to get help in a hurry . . . like crowded places or elevators or buses or trains?

If the answer to the question is no, the interviewer skips to the next vignette. Otherwise, more information about the period of time is obtained. Certain single-symptom diagnoses (e.g., enuresis, tics) are not represented in the whole-life assessment because earlier episodes are asked about in the basic instrument (Table 1).

The psychometric performance of this section has not yet been assessed. Given that recall for distant psychiatric disorders tends to be mediocre at best and can be influenced by present mental state (Bromet et al., 1986; Dohrenwend, 1990; Pulver and Carpenter, 1983), the whole-life module of the NIMH DISC-IV should be used

TABLE 2

Example of DISC Question (Major Depression)

I'm now going to ask you some questions about feeling sad and unhappy.

1. In the last year—that is, since you started seventh grade—was there a time when you often felt sad or depressed?
IF YES
 - A. Was there a time in the last year when you felt sad or depressed for a long time each day?
IF NO, GO TO Q 2
 - B. Would you say that you felt that way for **most of the day**?
 - C. Was there a time when you felt sad or depressed **almost every day**?
IF NO, GO TO Q 2
 - D. In the last year, were there two weeks in a row when you felt sad or depressed almost every day?
IF NO, GO TO Q 2
 - E. When you were sad or depressed, did you feel better if something good happened or was about to happen to you?
 - F. Now, what about the **last four weeks**? Since the beginning of August, have you felt sad or depressed?

Note: DISC = Diagnostic Interview Schedule for Children.

with caution until empirical research has been completed to support its use.

Onset

The NIMH DISC-IV includes a script to determine initial and recent onset of a diagnosis to allow investigators to assess incidence. The interviewer renames all symptoms reported as present in the past year and then asks for the youth's age "the first time" that these symptoms occurred. This is followed by a series of questions to assess earlier discontinuous episodes.

Impairment

Since the *DSM-IV* (American Psychiatric Association, 1994) explicitly includes impairment as a criterion for assigning most diagnoses, the NIMH DISC-IV incorporates a series of impairment questions at the end of each diagnostic section. These questions are uniform across all diagnoses and address 6 domains in which impairment might be present during the "time in the last year when SYMPTOMS caused the most problems." The domains assessed are (1) getting along with parents/caretakers; (2) participating in family activities; (3) participating in peer activities; (4) academic/occupational functioning; (5) relationships with teachers/boss; and (6) distress attributable to symptoms. Each set of questions has a 2-part structure, the first determining whether impairment is present, the second measuring severity or frequency.

Shaffer et al. (1996) reported that a fairly substantial number of unimpaired subjects (i.e., Children's Global Assessment Scale score > 70) in a community sample met symptomatic criteria for a *DSM* diagnosis. This is especially likely in children and adolescents with symptoms of anxiety. Thus, depending on the research question, investigators might wish to require endorsement of one or more impairment items before assigning a diagnosis or to use the "symptom *and* impairment" algorithms described in a later section of this report.

Scoring, Diagnostic Algorithms, and Symptom Scales

The DISC is scored by computer-driven rules that apply Boolean logic (i.e., *and*'s and *or*'s) to component questions. These are programmed in SAS (SAS Institute, 1990). The interview can be hand-scored, but this is a complex and error-prone procedure.

Algorithms have been prepared to score the parent and youth versions of the DISC separately ("single-informant" algorithms) or to combine information from both the par-

ent and the youth interviews. In this instance, a criterion is considered present if reported by either informant. Thus, a diagnosis requiring 5 criteria to be present would be scored positively even if 2 were reported by one informant and a different 3 by the other. Additional algorithms have been prepared to assess "cases," defined by both symptomatic criteria plus a significant degree of impairment.

The DISC attempts to follow to the letter the requirements in the *DSM-IV* and *ICD-10*, and, as a result, many DISC algorithms adhere more closely to the rules as stated in the manuals than do those of other interviews, such as the Children's Assessment Schedule (Hodges et al., 1982), the Diagnostic Interview for Children and Adolescents (Reich, 2000), and the Child and Adolescent Psychiatric Assessment (Angold and Costello, 2000). For example, in the DISC, all symptoms of major depression must co-occur within the same time period and last "nearly every day for 2 weeks . . ." Other examples of the DISC's strict fidelity to *DSM* include the assessment of ADHD and oppositional defiant disorder, where duration of 6 months is elicited for each symptom rather than for the syndrome as a whole, and the strict requirement in posttraumatic stress disorder that all symptoms occurred or got worse after the traumatic event.

In addition to the diagnostic algorithms, symptom and criterion scales (essentially "counts") have been created for most diagnoses. Symptom scales comprise all of the key stem questions that are asked of all respondents for a given diagnosis. Criterion counts are derived from combinations of stem and contingent items defined to match a given criterion. Scale points have been prepared from test data to indicate which cutoff scores best predict diagnosis (Lucas et al., 1997).

Computer Versions

The dual time frame and the elective module for lifetime diagnosis have increased the complexity of the NIMH DISC-IV, which already imposes a considerable burden on the interviewer by virtue of its complicated branching and skipping instructions and the need to keep close track of an informant's answers to numerous symptoms in order to ask onset and impairment questions correctly. It is recommended that investigators using more than a single diagnostic module employ a computer-assisted program to aid interview administration. Many characteristics of the DISC make it an ideal candidate for computerization. These include the highly structured nature of the interview, the limited response options, and the virtual absence of

open-ended responses. Using a computer-assisted program greatly minimizes interviewer and editor error, reduces training time, and eliminates data entry costs, but does not usually reduce administration time.

Currently, the only computerized version of the NIMH DISC-IV is the C-DISC-4.0, owned and distributed by the Division of Child and Adolescent Psychiatry at Columbia University. This program is available in both English and Spanish and can be run in DOS or Windows. The SAS single-informant scoring algorithms are built into the computer application program, which uses this logic to generate a diagnostic report that lists diagnoses, criteria, or symptoms present for both the "past year" and "current" (past 4 weeks) within minutes of the completion of an interview. To use the diagnostic algorithms developed to combine information across informants, assess symptomatic criteria plus impairment, or generate symptom and criterion scales, one needs to download data from the computer application into an ASCII file that can be read by the SAS algorithms. Hardware requirements for the C-DISC-4.0 are modest and can be met with a 486 processor, 4 MB RAM, 3 MB hard disk space, and 550 K free conventional memory, and either Windows 95 or Windows 98.

Under an agreement with NIMH, unlimited copies of the C-DISC-4.0 are available for use in projects supported by the Department of Health and Human Services (DHHS) for a license fee that is set by the agency each year. Copies are also available for non-DHHS public health users and clinical and commercial users, and, at a modest cost, for investigators with small grants (totaling less than \$50,000 per annum), graduate students, and educators. All fees support access to technical support and program updates.

Spanish Version

The NIMH DISC-IV has been translated into Spanish by Glorisa Canino, Ph.D., and colleagues at the University of Puerto Rico under the direction of an International Spanish Advisory Group sponsored by the NIMH.

Administration Time

The administration time for the whole NIMH DISC-IV in a community population averages approximately 70 minutes per informant, and approximately 90 to 120 minutes for known patients. Dropping diagnostic modules that are not relevant to a particular setting or study can shorten administration time.

Training

The usual training session consists of teaching the conventions and rules for administering the DISC, instruction on how to use timelines, identification of the "active" parts of symptom questions, techniques for nondirective presentation of questions and acceptable probing techniques, and instruction for how to use the computer software. Demonstrations by the trainer(s), round-robin exercises, and videotape demonstrations are included, as are practice interviews, where trainees interview and observe one another. Training on the computer-assist versions of the NIMH DISC-IV typically can be completed in 2 or 3 days, depending on trainees' experience with structured interviews. Training in the use of the DISC on paper takes an additional 2 to 3 days. The most important qualities to assess in selecting interviewers are the ability to read aloud with expression, comfort with using a computer (if appropriate), and willingness to adhere to the rules for administration.

Studies/Diagnoses/Designs for Which the DISC Is Most Useful

Although the NIMH DISC was designed to be used in large-scale, epidemiological studies, it has also been used successfully in treatment studies to assess inclusion and exclusion criteria (Hinshaw et al., 1997), as an adjunct to public health screening to increase the specificity of brief initial screens (Shaffer et al., 1998), and as an adjunct to a comprehensive evaluation procedure in residential facilities (P. Friman, 1999; L. MacDonald, 1998; C. Willis, 1997, personal communications).

In purely clinical settings, the DISC can serve as a diagnostic aid, freeing the clinician from making lengthy inquiries about important but improbable diagnoses. In this way, the DISC can serve as a complement to, not a replacement of, usual clinical practice.

Pros and Cons of the DISC

The primary advantages of respondent-based interviews such as the DISC are that, computerized, they are relatively inexpensive to use in a research setting and offer a greater potential for standardization and reduced error. They are also comprehensive. The limitations of the instrument include its inability to address invalid responses given by a respondent who misunderstands a question and its inability to allow atypical presentations to be presented, being restricted to assessing the symptoms in the *DSM* and *ICD* systems.

NIMH DISC Editorial Board

In 1992, NIMH appointed the NIMH DISC Editorial Board (DEB) to oversee further development of the DISC and provide an orderly process for the implementing of well-based proposals for modifying a standard version of the DISC. David Shaffer, M.D., chairs the DEB; Prudence Fisher is Executive Secretary.

The Board serves an advisory/review function and maintains responsibility for approving "official" versions of the instrument, including approving the scoring algorithms, translations, etc. While the DISC interview is currently in the public domain and is not subject to copyright limitations, the name *NIMH DISC* can be used only to describe instruments reviewed and approved by the DEB. Users are discouraged from introducing untested modifications to the instrument.

Investigators who feel it imperative to modify the DISC to meet a particular research need are requested to document the modifications in any associated research publication and indicate that the modified instrument may not function in the same way as the standard NIMH DISC.

N.B. from editors: The editors of this Special Section urge readers not to make any changes in the DISC and not to use any such unauthorized versions, however well-intentioned. The fact that the instrument was developed with federal money vitiates any copyright, which, in the editors' view, is in this case unfortunate in that it strikes at the very core of the notion of a standardized instrument. We suggest that readers tacitly accept that a moral and scientific copyright

exists, although it is clear that well-conducted psychometric studies published in refereed journals which address exposed deficiencies in the instrument are to be encouraged.

In addition to a Spanish translation, other non-English versions of the NIMH DISC-IV are in preparation by various investigators.

PERFORMANCE OF THE NIMH DISC-IV

Partial results concerning the performance of the C-DISC-4.0 are available from a study of 84 parents and 82 children (aged 9-17 years; mean age 12.6 years) recruited from child and adolescent psychiatric outpatient clinics (Fisher et al., 1997). All subjects were fluent in English and clinically diagnosed as meeting *DSM* criteria for "common" disorder in the past year (including depressive disorders, social or specific phobia, separation or generalized anxiety disorder, ADHD, oppositional defiant disorder, or conduct disorder). Sixty percent of the sample was African-American and/or Hispanic. The NIMH DISC-IV was administered twice, with a mean interval between tests of 6.6 days. Lay interviewers were trained for 2 to 4 days, and 4 interviewers were assigned to each subject, so that interviewers were blind to responses given by the other informants and at the other testing session.

Test-Retest Reliability

Clinical Sample. See Table 3 for reliability of the "1-year" diagnosis of a selected number of diagnoses. Data from a comparable sample (Jensen et al., 1995) using the DISC-

TABLE 3
Test-Retest Reliability of DISC-IV in a Clinical Sample (Past Year): κ Statistic (Children Aged 9-17 Years)

	DISC-IV ^a			DISC-2.1 ^b		
	Parent (n = 84)	Youth (n = 82)	P and Y Combined	Parent (n = 88-97)	Youth (n = 88-97)	P and Y Combined (n = 83-97)
ADHD	0.79	0.42	0.62	0.69	0.59	0.68
ODD	0.54	0.51	0.59	0.67	0.46	0.61
Conduct disorder	0.43	0.65	0.55	0.70	0.86	0.71
Any anxiety disorder ^c	—	—	—	0.58	0.39	0.50
Specific phobia	0.96	0.68	0.86	—	—	—
Social phobia	0.54	0.25	0.48	—	—	—
Separation anxiety	0.58	0.46	0.51	—	—	—
Generalized anxiety	0.65	—	0.58	—	—	—
Major depressive episode	0.66	0.92	0.65	0.69 ^d	0.38 ^d	0.70

Note: DISC = Diagnostic Interview Schedule for Children; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder.

^a Fisher et al., 1997.

^b Jensen et al., 1995.

^c Includes specific phobia, social phobia, separation anxiety disorder, overanxious disorder, panic disorder, etc.

^d These numbers (from DISC-2.1) are for depression and/or dysthymia. DISC-IV numbers are for major depressive episode only.

TABLE 4
Test-Retest Reliability of DISC-2.3 in a Community Sample

	Diagnostic Reliability ^a (κ Statistics)			Scale Reliability ^b (ICCs)					
				Symptom Counts			Criterion Counts		
	Parent	Youth	Parent and Youth Combined	Parent	Youth	Parent and Youth Combined	Parent	Youth	Parent and Youth Combined
ADHD	0.60	0.10	0.48	0.84	0.65	0.79	0.77	0.70	0.80
ODD	0.68	0.18	0.59	0.85	0.64	0.80	0.81	0.57	0.77
Conduct disorder	0.56	0.64	0.66	0.63	0.83	0.85	0.93	0.92	0.91
Any anxiety disorder ^c	0.56	0.39	0.47	—	—	—	—	—	—
Overanxious disorder	0.60	0.28	0.52	0.73	0.40	0.46	0.71	0.44	0.55
Separation anxiety	0.45	0.27	0.49	0.74	0.46	0.61	0.67	0.46	0.61
Social phobia	0.45	0.33	0.44	0.63	0.44	0.24	0.61	0.44	0.58
Simple phobia	—	—	—	0.69	0.53	0.72	0.69	0.53	0.71
Panic disorder	—	—	—	0.43	0.11	0.22	0.46	0.05	0.12
Agoraphobia	—	—	—	0.64	0.49	0.53	0.66	0.35	0.40
Major depression	0.55	0.37	0.45	0.79	0.52	0.64	0.51	0.40	0.49

Note: DISC = Diagnostic Interview Schedule for Children; ICC = intraclass correlation coefficient; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder.

^a Schwab-Stone et al., 1996.

^b Shaffer et al., 1996.

^c Includes social phobia, agoraphobia, panic, overanxious disorder, generalized anxiety disorder, and separation anxiety disorder.

2.1 are also shown for comparison. Despite its greater length and complexity, the current standard NIMH DISC-IV compares favorably with earlier versions. A more complete report of the reliability of the NIMH DISC-IV on a large sample (of which this sample will comprise part) is in preparation (W. Narrow, personal communication, 1999).

Community Sample. The most recently published test-retest reliability/validity data for a community sample comes from the MECA study (Schwab-Stone et al., 1996), which used the previous version, DISC-2.3. The study sample comprised 247 parent-child pairs (child aged 9-7 years) where 134 of the youths were judged on the time 1 DISC interview to be "symptom-rich" (the rest were negative for disorder at time 1). Lay interviewers completed initial interviews; retests were given by clinicians, using standard procedures. In general, the DISC showed moderate to good diagnostic reliability (κ statistic) for the parent interview and using information from both parent and youth interviews in combined algorithms. When examined separately, reliability on the child interview was, in general, and with the exception of conduct disorder, less good (Table 4). Most of the unreliability in the interview seemed due to the "attenuation effect" (Lucas et al., in press) seen in all forms of repeated psychiatric evaluations (Andreasen et al., 1981; Anthony et al., 1985; Costello et al., 1993; Helzer et al., 1985; Jensen et al., 1995; Lucas, 1992; Werry and Hawthorne, 1976).

Reliability may appear misleadingly low when applied to categorical diagnoses. A change in a single response can bring the case to above or below the diagnostic threshold. To determine whether this was the case, the reliability of the symptom and criterion scales for the DISC-2.3, using intraclass correlation coefficients, was calculated using the data from the MECA exercise. As expected, for most diagnoses, the symptom and criterion scales had better reliability than did the categorical diagnoses (Table 4).

Validity

To date, there has been no formal validity testing of the NIMH DISC-IV. However, the MECA study included a validity exercise for the DISC-2.3 (Schwab-Stone et al., 1996); its purpose was to determine whether information elicited on the DISC in the community corresponded to clinically meaningful symptomatology. When the clinicians conducted the DISC (time 2) interview, they noted behaviors that might indicate an ambiguous response (e.g., marked hesitations, puzzled looks). Questions for which this occurred and all criteria that had been endorsed were the focus of a further, third inquiry with the format: "You told me that you had _____. Please tell me more about that" or "When I asked you _____, you seemed unsure about your reply. Can you tell me more about that?" On the basis of answers to these questions, the clinician made

a new rating, which was then compared with the clinicians' original DISC ratings. In general, agreement between the DISC and the clinician rating were moderate to very good for both informants separately and combined, except for parent report of separation anxiety and youth report of ADHD, both of which were poor (Table 5).

Another approach to testing validity was used by Fisher et al. (1993), who examined the sensitivity of the DISC-2.1 for certain uncommon psychiatric disorders (i.e., major depressive, obsessive-compulsive, psychosis, tic, and substance use disorders). Subjects were recruited from centers specializing in the treatment of each of the uncommon disorders, and their diagnosis had been confirmed by senior clinicians at each center, so that the centers' diagnoses served as the criterion measure. Overall findings showed that the DISC-2.1 had good to excellent sensitivity (range = 0.73 to 1.0) for these disorders. Used alone, the parent DISC interview was generally more sensitive than the youth interview.

Administration Time and Acceptability to Informant

The mean time for the parent interview in this clinic sample was 115 minutes (range: 62–283 minutes) at time 1 and 95 minutes (range: 53–166 minutes) at time 2. The mean time for the youth interview was 113 minutes (range: 54–247) at time 1 and 87 minutes (range: 48–169) at time 2.

After completion of the second interview, all subjects were asked about their reaction to the interview. These questions were completed privately and responses were put in a sealed envelope: 42% of parents and 55% of youths thought the interview was too long and 51% of

parents and 36% of youths thought it was the "right length"; 7% of the parents and 17% of the youths rated the interview as boring; 4.7% of parents and 3.6% of youths reported being more upset after the interview than they had been prior to its administration, but 66% of parents and 60% of youths said that they would "tell a friend to participate."

EXISTING AND PROPOSED DERIVATIONS OF THE NIMH DISC-IV

Alternative versions of the NIMH DISC-IV have been or are being prepared. None of these derivations are yet "official" versions, as they have not received the final approval of the DEB. Information about each of these versions can be obtained from the Columbia DISC Development Group.

Present State DISC (1997)

The Present State DISC (DISC-PS) addresses only "current" (in most instances, the past 4 weeks) and "lifetime" diagnoses. This version might be more useful than the NIMH DISC-IV in clinical settings or for screening purposes. This version has been computerized, and field studies of reliability and acceptability are in progress.

Teacher DISC (1998)

A teacher interview (the DISC-T), based on the NIMH DISC-IV parent interview, has been prepared by Benjamin Lahey, Ph.D., and Gwen Zahner, Ph.D., with assistance from the Columbia DISC Development Group. The DISC-T is limited to disorders whose symptoms might be expected to be observable in a school setting (i.e., disruptive disorders, certain internalizing disorders). The DISC-T has been computerized and is being tested. Analyses at Columbia University/New York State Psychiatric Institute, on data obtained during the telephone administration of a form of the DISC-2.3 to teachers of children 9 to 11 years old, have shown that use of a teacher interview may be valuable in assessing children younger than age 12 years (Madelyn Gould, personal communication, 1996).

DISC Predictive Scales

Two scales based on stem questions from the NIMH DISC-IV have been developed (Lucas et al., 1997) for the purpose of predicting which subjects will be diagnosed with and without a disorder on later full DISC evaluation. The DISC Predictive Scales can be used as a short, self-report, screening questionnaire or as a triage device to

TABLE 5
Validity of DISC-2.3 in a Community Sample
(*n* = 247) (κ Statistic)

	Parent	Youth	Parent and Youth Combined
ADHD	0.72	0.27	0.70
ODD	0.59	0.54	0.65
Conduct disorder	0.74	0.77	0.80
Any anxiety disorder ^a	0.62	0.49	0.56
Overanxious disorder	0.60	0.23	0.51
Separation anxiety	0.29	0.59	0.40
Social phobia	0.53	0.45	0.43
Major depression	0.60	0.79	0.63

Note: Schwab-Stone et al., 1996. DISC = Diagnostic Interview Schedule for Children; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder.

^a Includes social phobia, agoraphobia, panic, overanxious disorder, generalized anxiety disorder, separation anxiety disorder.

select which DISC modules to administer. It is anticipated that these predictive scales will also be embedded in the Quick DISC (see below).

Young Adult DISC (in Testing)

The DISC has already been used in an 18- to 24-year-old population (Shaffer et al., 1998). However, a customization is being prepared that will cover students at college and young adults living independently.

Voice DISC

A sound version of the DISC-PS (the Voice DISC) has been prepared for self-administration by children and adolescents, using a computer and headphones or speakers. As reported by Turner et al. (1998), adolescents are more likely to be forthcoming in their reports of socially undesirable symptoms (e.g., drug and alcohol use, suicidal ideation, and sexual behaviors) when provided with a self-administered interview format than if interviewed by a person.

Quick DISC (in Development)

Researchers and clinicians often have only a short period of time to obtain diagnostic information. The regular DISC, although comprehensive, can be lengthy to administer. The Quick DISC, which is in development, will include far more logical skips based on empirical data to allow interviewers to move out of irrelevant sections as soon as it is clear that diagnostic criteria for a given disorder will not be met.

USER INFORMATION

To obtain further information about the NIMH DISC-IV, its derivatives, and new versions; to submit questions about its use for specific research and/or clinical needs; to obtain information on cost structures, training, and scoring; and to obtain copies of scoring manuals, please contact the Columbia DISC Development Group, Division of Child and Adolescent Psychiatry, 1051 Riverside Drive, New York, NY 10032; telephone: (888) 814-DISC; fax: (212) 543-5966; e-mail: disc@worldnet.att.net.

For information about the Spanish translation of the NIMH DISC-IV, please contact Glorisa Canino, Ph.D., Professor and Director, Behavioral Science Research Institute, Medical Sciences Campus, University of Puerto Rico, PO Box 365067, San Juan, PR 00936-5067.

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A New Brief Screen for Adolescent Substance Abuse. John R. Knight, MD, Lydia A. Shrier, MD, MPH, Terrill D. Bravender, MD, Michelle Farrell, Joni Vander Bilt, MPH, Howard J. Shaffer, PhD

Objective: To develop a brief alcohol and other drug (AOD) screening test for adolescents. **Methods:** A 9-item test was constructed by combining and modifying items from several AOD assessments, and administered concurrently with the Personal Involvement With Chemicals Scale (PICS), the criterion standard. **Setting:** A hospital-based adolescent clinic. **Subjects:** Fourteen- to 18-year-old patients consecutively arriving for routine medical care who were known to have used AOD. **Measures:** Internal consistency of the 9 items was calculated using the Cronbach α . The relationship between the brief screen and PICS raw score was determined by stepwise linear regression analysis. The PICS T score has been shown to correctly classify substance abuse treatment need as no treatment ($T < 35$), brief office intervention ($T = 35-40$), outpatient or short-term treatment ($T = 41-54$), and inpatient or long-term treatment ($T \geq 55$). Sensitivity and specificity rates for predicting a PICS T score of 55 or higher were calculated from 2×2 tables. **Results:** Ninety-nine adolescents were tested (70.7% female, 36.4% black, 32.3% white, 19.2% Hispanic, mean age, 16.3 years). The 9 items had good internal consistency (Cronbach $\alpha = .79$). Stepwise linear regression analysis identified 6 items whose total combined score was highly correlated with PICS (Pearson $r = 0.84$, $P < .01$). This model correctly classified 86% of subjects according to the PICS criteria. Two or more answers had a sensitivity of 92.3% and specificity of 82.1% for intensive AOD treatment need. The 6 items were arranged into a mnemonic (CRAFFT). **Conclusions:** Further research must confirm the test's psychometric properties in a general clinic population. However, CRAFFT seems promising as a brief AOD screening test. *Arch Pediatr Adolesc Med* 1999;153:591-596. Copyright 1999, American Medical Association.