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A Change of Mind: The Conners Abbreviated Rating Scales Reconsidered[1]

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A cutoff score of 15 on the Conners 10-item Abbreviated Teacher Rating Scale (ATRS), based on a study from this laboratory, has been widely used by investigators for diagnosis of the syndrome known now as Attention Deficit Disorder with or without Hyperactivity. A replication of the original research employing a larger norm sample indicates that the suggested score of 15 is too low. Comparing the norm sample with hyperactive subjects selected by cutoff of 15 on the ATRS showed that the groups differed greatly on hyperactivity but not on inattention. The abbreviated form of the Conners scale does not effectively select children with attention deficits. Numerous problems with both the 39-item teacher scale and the abbreviated form suggest strongly that they be abandoned as research tools.

Numerous researchers have made use of a 10-item teacher rating scale, the Abbreviated Teacher Questionnaire or Abbreviated Teacher Rating Scale (ATRS) recommended by Conners (1972, 1973), to diagnose hyperactivity and monitor treatment effects in schoolchildren. The 1973 version of the ATRS was included in the Early Clinical Drug Evaluation Unit (ECDEU) recommendations for use in selecting and monitoring hyperactivity. All 10 items on the scale appeared on a 93-item parent questionnaire (Conners, 1973), two items with somewhat different wording. Five of those items had

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also appeared on the original teacher questionnaire (Conners, 1969), three with wording altered on the subsequent abbreviated form.

Factor analyses were performed by Conners in the 1969 version of the 39-item teacher questionnaire and on the 1973 93-item parent questionnaire. The 1973 teacher questionnaire, also coincidentally 39 items, was not factor-analyzed, although it had been considerably changed. Conner substituted 5 items from the abbreviated scale verbatim into the 1973 39-item form.

Table I shows each of the 10 items listed by Conners in the 1973 ATRS, the source of each item, variations from the original wording, and the factor loadings for those items for which Conners had reported a factor analysis.

On the basis of empirical findings, Sprague, Cohen, and Werry (1974) recommended a cutoff (minimum score) of 15 (2 standard deviations above the overall mean score) for selection of children on that version of the ATRS. Throughout the years since, several different versions of the 10-item scale have appeared, and researchers have employed the same cutoff for all versions, seemingly unaware that the cutoff was appliable only to the 1973 version.

The changes in the 10-item ATRS have occurred in name and wording of items. Because most authors did not list the items included in the cited versions, it is usually not possible to be certain what version was used. Table II displays the items as they appeared in the ECDEU version (Conners, 1973), in a version distributed by Abbott Laboratories in 1972 (J. Loney, personal communication, November 8, 1974), and in the parent and teacher forms published recently by Goyette, Conners, and Ulrich (1978).

The identical cutoff score, a total raw score of 15 or a mean item score of 1.5, has been applied by researchers with the several versions of the 10-item instrument, regardless of the fact that items were sometimes worded differently and in some cases were entirely different from the items included among the original 10 (Conners, 1973). The mean item score of 1.5 as also been used as a cutoff for the 39-item Conners Teacher Rating Scale (Sprague & Sleator, 1976; Trites, 1979) and for the Hyperactivity factor (Trites, 1979; Trites, Blouin, Ferguson, & Lynch, 1981) derived from it.

Further, some procedures were followed in deriving the cutoff of 15 that may have resulted in a biased estimate. A new and more extensive norm sample has resulted in revised minimum scores that are substantially higher than those previously suggested, and different cutoffs are derived for boys and girls.

Finally, there is evidence that the 10-item instrument, while efficient at selecting children with conduct disorders and hyperactivity, fails to select children whose primary difficulty is inattention. This paper compares the distribution of the new, larger norm sample and a referred (clinical) sample on Hyperactivity and Inattentive-Passive factors of the Conners 39-item

Table I. Factor Loading of Items on the 1973 10-Item Abbreviated Teacher Questionnaire

ATRS item	Source of item			
	1969 Teacher Questionnaire[a]		Parent Questionnaire[b]	
	Factor loading		Factor loading	
1. Restless, overactive	IV	Hyperactivity (.80)	I	Conduct problem (.49)
2. Excitable, impulsive	IV	Hyperactivity (.62)	I	Conduct problem (.51)
Excitable (1969 teacher form)				
3. Disturbs other children	I	Conduct problem (.55)	I	Conduct problem (.67)
	IV	Hyperactivity (.66)		
4. Fails to finish things he starts			I	Conduct problem (.44)
5. Constantly fidgeting				Not factor-analyzed
6. Inattentive, easily distracted[c]	II	Inattentive-immature (.62)		Not factor-analyzed
Inattentive (1979 teacher form)[d]				
7. Demands must be met immediately, easily frustrated			III	Impulsive hyperactive (.56)
8. Cries easily and often[c]			VIII	Muscular tension (.44)
Cries (parent form)[d]				
9. Mood changes quickly and drastically[c]				
Mood changes quickly (parent form)[d]			III	Impulsive hyperactive (.48)
10. Temper outbursts, explosive and unpredictable behavior[c]	I	Conduct problem (.71)	I	Conduct problem (.50)
Temper outbursts (1969 teacher form)[d]				

[a]Conners (1969)
[b]Conners (1973).
[c]Version not factor-analyzed but used in the original version of the ATRS.
[d]Factor-analyzed version.

Table II. Wording of Items and Type of Behavior in Four Versions of the Conners 10-Item Scale

Item[a]	1973[b]	1974	1978-T	1978-P
1. Restless or overactive	+[c]	0[c]	0	0
Restless, in the "squirmy" sense	0	+	+	+
Restless, always "up and on the go"	0	+	+	+
2. Excitable, impulsive	+	+	+	+
3. Disturbs other children	+	+	+	+
4. Fails to finish things he starts, short attention span	+	0	0	0
Fails to finish things he starts	0	+	+	0
Fails to finish things	0	0	0	+
5. Constantly fidgeting	+	0	0	0
6. Inattentive, easily distracted	+	0	0	0
Distractibility or attention span a problem	0	+	+	+
7. Demands must be met immediately, easily frustrated	+	0	0	0
Demands must be met immediately	0	+	0	0
Easily frustrated in efforts	0	+	+	+
8. Cries often and easily	+	0	0	0
Cries easily or often	0	0	0	+
9. Mood changes quickly and drastically	+	0	+	+
10. Temper outbursts, explosive and unpredictable behavior	+	0	0	0
Temper outbursts and unpredictable behavior	0	0	+	0
Childish and immature	0	+	0	0
Difficulty in learning	0	+	0	0
Pouts and sulks	0	0	+	0
Destructive	0	0	0	+

[a]Numbered items are in the 1973 version; unnumbered items indicate similar wording from other versions.

[b]1973: Conners (1973); 1974: Abbott Laboratories (1972); 1978-T: Goyette, Conners, and Ulrich (1978), Teacher Form; 1978-P: Goyette, Conners, and Ulrich (1978), Parent Form.

[c]+ = present; 0 = absent.

Teacher Rating Scale (TRS). The comparison illustrates the fact that the two groups differ greatly on Hyperactivity, whereas there is considerable overlap between the normative group and the referred group on the Inattentive-Passive factor.

METHODS

Norm Sample

Data were collected in the midwestern farming-industrial community of Danville, population 38,900. All teachers of second- and third-grade classes were asked to complete the Conners 39-item (TRS) teacher rating scale (Con-

Table III. Means, Standard Deviations, and Recommended Cutoff Scores for the 10-Item Conners Scale

		Mean	*SD*	*Mean*+2 *SD*s	Suggested minimum 10-item score	Percent of group selected
Overall	732	8.5	7.1	22.7	26	2.2
Boys	372	10.0	7.5	25.0	27	1.9
					26	3.2
Girls	360	7.0	6.3	19.3	25	1.7
					24	2.2
Grade 2	360	8.8	7.1	23.0	26	2.3
Grade 3	372	8.3	7.0	22.3	26	2.2
Caucasian	558	8.0	7.0	23.0	26	1.8
					25	2.7
Black	155	11.0	6.9	24.8	27	2.4
Other	19	5.1	6.3	17.7	–	–

ners, 1973) twice, separated by approximately 1 month. Ratings on a 0-to-3 scale for each child in the classroom were completed in April and again in May. The teachers were asked to rate each child as he most often appeared. To encourage cooperation and prompt return of the ratings, teachers were paid upon completion of both ratings.

The teachers of 732 children sent in complete data on the first rating. Table III shows the breakdown of the norm group by sex, grade, and race. Teachers of 616 children completed both ratings. Pearson product-moment correlations were calculated by item for the children with two ratings, and for the group subdivided by sex, grade, and race to determine the stability of the ratings across a 4- to 6-week period (see Table IV). Correlations ranged from a low of .49 for girls on item 7, *Cries often and easily,* to a high of .81 for third-graders on item 8, *Disturbs other children.* All correlations were significant at p less than .001.

Conners 10-Item Scale

For purposes of this study, the 10-item subset (ATRS) that was standardized by Sprague and his colleagues for use in screening for hyperactivity (Sprague et al., 1974) was examined. On the original standardization, Sprague et al. used a cutoff score of 2 standard deviations above the mean, which corresponds to approximately 2% of a normal distribution. Because the teacher ratings are not distributed normally, as was also true in the 1974 study, cutoff scores are reported in this paper that select approximately 2 to 3% of the sample. While this procedure reduces the number of false positives (children labeled deviant who in fact are not deviant), the number of false negatives is increased because there is a reciprocal relationship between false positives and negatives (Loney & Milich, 1982).

Table IV. Test-Retest Reliabilities for the Conners 10-Item Scale in the Norm Sample[a]

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
	Fidgeting	Demands	Restless	Excitable	Inattentive	Attention span	Cries	Disturbs	Mood	Temper
Total	.76	.73	.78	.72	.80	.79	.54	.81	.73	.75
Boys	.72	.74	.75	.73	.81	.79	.58	.80	.76	.79
Girls	.79	.71	.80	.68	.79	.77	.49	.80	.69	.67
Grade 2	.72	.72	.79	.72	.81	.77	.52	.80	.67	.74
Grade 3	.80	.75	.78	.72	.79	.81	.55	.81	.79	.76

[a]All significant at $p < .001$.

Clinical Sample

Over a period of 8 years, teachers of children admitted into the authors' psychopharmacology project completed the 39-item TRS (Conners, 1973), from which the 10 items suggested by Conners (1973) were used for screening. Children whose raw score on the ATRS was below the cutoff of 15 were excluded from the project. This study compares the clinical and norm samples on the distribution of scores on two factors of the 39-item (TRS) Scale, Hyperactivity and Inattentive-Passive.

RESULTS

Norm Sample

Figure 1 shows the percentages of children who were rated at or above the cutoff score of 15 on the 10 items of the Abbreviated Teacher Rating Scale (ATRS). Percentage of children at or above the cutoff is compared for sex, grade level, and race. Note that a higher percentage of boys and of blacks were rated above the cutoff of 15, but there was little difference between the grades.

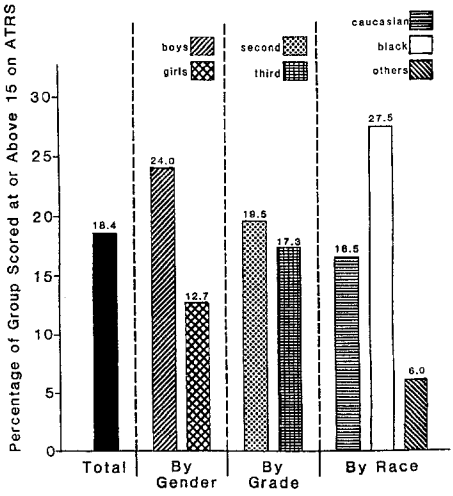

Fig. 1. Percentages of children above the 15 cutoff for sex, grade, and race for the ATRS.

Implications of Norm Finding

Using the 10 items suggested by Conners (1973; see Table II), cutoffs that selected approximately 2-3% of the group are shown in Table III with the number of children in each group by sex, grade, and race.

There is no difference in cutoff scores on the 10-item scale between second- and third-grade children in this sample, but as girls' and boys' total raw scores may differ by as much as 4 points, if one were to continue to use the ATRS, it would be improper to use cutoffs lower than 24-25 for girls and 26-27 for boys. However, it must be emphasized that children with extreme scores on this instrument may be deviant with respect to hyperactivity and conduct disorder but not necessarily with respect to attention (see below).

Because the ATRS has only two items referring to attention (maximum score: 6) and three items describing overactivity nd impulsive behavior, a well-behaved child who is ADD without Hyperactivity—i.e., deviant on attention but average on hyperactivity (1.5 per item)—would score between 10 and 12 on the ATRS. A child with this behavior pattern would not qualify for inclusion in research requiring a minimum score of 15. Children who are deviant with respect to both ADD and Hyperactivity could receive a total score of 15 on the ATRS, but unless they are also deviant with respect to immaturity or aggressive behavior, they would fail to qualify for study using the cutoff (minimum) scores suggested by the current data (24 for girls, 26 for boys).

Comparison of Normative and Clinical Samples

Because a cutoff score of 15 on the ATRS has been used by a number of research groups including the authors, the distribution of scores on the Hyperactivity and Inattentive-Passive factors was compared between the norm sample and 183 referred children with scores of 15 or above on the Conners 10-item scale, 1973 version (see Figure 2).

Distribution of scores in the norm group on Hyperactivity (Figure 2A) is highly skewed, with the large majority of the group receiving factor scores at the low (appropriate behavior) end of the distribution, whereas the scores of the clinical group are concentrated at the upper (inappropriate) end of the distribution. There is a 31.5% overlap of the total scores in both populations in the scores. A similar set of distributions was found for the Conduct Problem factor.[3] In contrast to the Hyperactive factor distributions, distribution of scores on the Inattentive-Passive factor for the clinical group overlaps 53% with the norm group (Figure 2B). It appears, therefore, that the

[3]Data are available upon request from the first author.

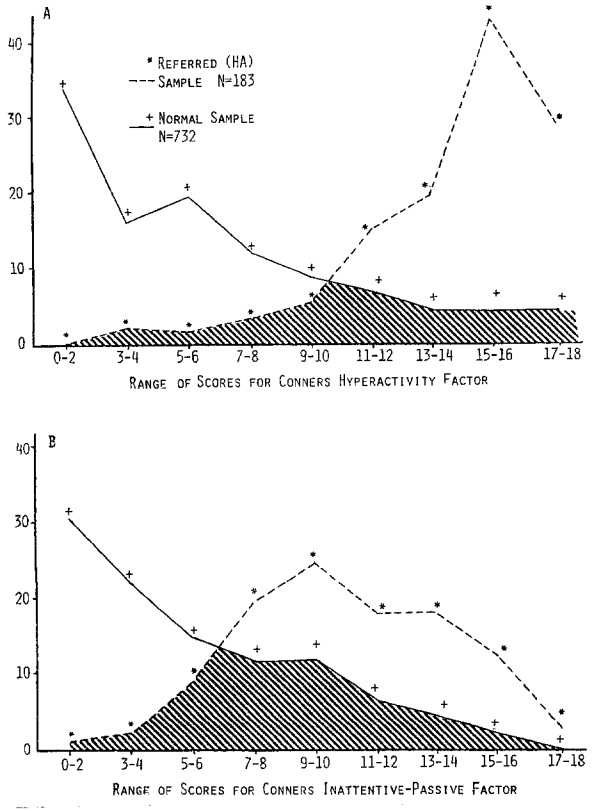

Fig. 2. Distributions of ATRS total scores for the referred and normal samples on Hyperactivity and Inattentive-Passive factors.

clinical group was selected for hyperactive and conduct problem behaviors but did not differ greatly from the norm sample on inattention. These findings confirmed our clinical "hunch" that the children selected by the cutoff score of 15 on the 10-item ATRS were inevitably hyperactive and antisocial, though not necessarily extremely inattentive. On the other hand, children who might have serious difficulty in concentrating (inattentive), but who were not seen as conduct problems, almost invariably scored too low on the ATRS to be included in the study.

DISCUSSION

There were four features of the ATRS used in conjunction with the cutoff score that stimulated us to replicate our previous work. First, only 2 items in the 10-item scale dealt with attention (items 4 and 6; see Table

II). Clearly this was inadequate as attention difficulty came to be recognized, with DSM-III (American Psychiatric Association, 1980), as the basic problem of the syndrome. Second, we became concerned after considerable clinical experience that the 10-item scale was selecting children who were hyperactive and antisocial, whereas well-behaved children with attention problems were being excluded as subjects, and, as has been shown, this has proven to be the case. Third, we began to be critical of our own methods in the original standardization of the ATRS. Finally, as already described, the need for replication began to seem urgent because of the widespread use of the cutoff of 15 on variations of the ATRS for which normative data had not been collected.

Why were the cutoff scores for the two standardization groups (1974 study and this study) so different? The standardization group in the earlier study was not randomly selected. Classes taught by teachers who had at least one research subject were selected (because the teachers were known to us and cooperative), but the research subject as well as children "who might be referrable" were excluded from the sample. This selection most certainly biased the mean scores considerably toward the low end and minimized the variance in the standardization group. Less certain, but still possibly a biasing factor, is that all the teachers involved had been rating hyperactive, aggressive children for our research project, and by contrast, the behavior of the other children might indeed have appeared better than "normal."

Although the authors presented separate means and standard deviations for boys and girls, cutoff scores that would have been suggested by those data were not explicitly stated. Therefore, researchers subsequently adopted the cutoff score actually included in the report that was based upon the means and standard deviations for the entire norm group (Trites et al., 1981). These three aspects of the methods used in obtaining the first norm data could in themselves have accounted for much of the difference between the two samplings. Given the improved methods and the much larger size of the sample, one would expect that the results reported in this study are more accurate. In addition, in a study of children in Madrid, Spain, Arias and O'Leary (1984) collected Conners TRS for 256 boys and 195 girls. Using the traditional cutoff score of 1.5 (mean item score; total raw score, 15) on the ATRS, 22% of the boys and 10.3% of the girls would be classified as hyperactive (with the rate for total sample 17%). Using the mean $+1.96$ *SD* for this sample, the boys' cutoff of 2.28 (mean item score) selected 4.7%, and the girls' cutoff of 17.9, 5.1% of the respective groups. The results for boys correspond with the findings reported in this paper. Because the scales published in 1978 by Goyettte et al. are based on different items from the earlier versions (Conners, 1969, 1973), the data from that study cannot be compared directly with the data reported here. Over the years, a large amount

of research has been extremely active using the 1973 scales, and another similar scale by Conners simply adds to the confusion.

Because behavioral disorders are invariably complex, utilizing a single "cutoff" point to determine whether or not a child is to be considered an appropriate research subject or diagnosed as deviant is inappropriate. Although in psychology it is customary to select 2 standard deviations from the mean for this purpose, such a selection is arbitrary and not a law of nature. Loney and Milich (1982) make clear in an enlightening discussion just how arbitrary such a point is and how it can be adjusted depending on whether one prefers to minimize false positives or false negatives. An alternative to using a single cutoff score is to use percentiles of the normal sample as criteria, which is psychometrically sound and clinically flexible. An example of this approach is the rating scale recently developed in this laboratory, the ADD-H Comprehensive Teacher Rating Scale (ACTeRS; Ullmann, Sleator, & Sprague, 1984a, 1984b). This scale provides the percentile rating equivalent of each set of behaviors (attention, hyperactivity, social skills, and oppositional behaviors) considered relevant to the syndrome. This enables the investigator to describe the research population much more specifically and the clinician to understand the specific weaknesses and strengths of each patient. With a more complete picture available, it is possible to make a judgment about the appropriateness of treatment without depending on a single number to be a major influence in the decision.

Finally, note that, with a cutoff of 15, and even more so with the higher minimum scores dictated by the current data, the 10-item scale cannot select children whose only problem is Attention Deficit Disorder with or without Hyperactivity, although a scale developed and normed in this laboratory (Ullmann et al., 1984a, 1984b) shows that such children do exist in both normal and clinical groups.

Unfortunately, in addition to the problems we have pointed out with the inappropriate use of a cutoff on the 10-item scale, it must be emphasized that there are many other difficulties with the Conners scales. There are 5 items on the 1973 39-item teacher rating scale that did not appear in the 39-item teacher scale factor-analyzed by Conners in 1969. To the best of our knowledge, no factor analysis has been performed on the items of the 1973 scale. Nonetheless, the 1973 scale is the version included in the ECDEU collection, and it is the version used by most researchers, including Sprague and his colleagues. The 5 items referred to here constitute substantive changes, not simply rewording of similar items. For example, item 13, "selfish" on the 1969 form, becomes "cries often and easily" on the 1973 form; item 15, "tattles," is changed to "mood changes quickly and drastically." The other 34 items remain identical in number and wording. The items included in the factor scales (Hyperactivity, Inattentiveness, Conduct Problems, and the like)

must be from the 1969 39-item teacher scale, as no subsequent analysis has been published by Conners

Unless one compares carefully, it is easy to assume that the 1973 EC-DEU 39-item teacher form and the 1969 39-item teacher form factor-analyzed by Conners are one and the same. The discrepancy has not been pointed out. In fact, in a 1972 paper Conners and his colleagues compound the confusion, stating that "a 39-item symptom checklist was mailed to teachers.... This rating scale had been previously factor-analyzed (Conners, 1969) and yields five factors scores which were separately scored...." Later in the same paragraph they state that "[10 items] from the two scales were used as an abbreviated scale..." (Conners, Taylor, Meo, Kurtz, & Fournier, 1972, pp. 324-325). If, in fact, this is the 10-item Abbreviated Teacher–Parent Questionnaire recommended by Conners in 1973 (Conners, 1973), most of the items appear not in the 1969 factor-analyzed teacher scale but only in the 1973 39-item teacher scale, which was not factor-analyzed.

For one recent example of the confusion that has resulted, see Arias and O'Leary (1984), who write: "The TRS typically yields five factors: Conduct Disorder, Inattention, Anxiety, Hyperactivity and Sociability (Conners, 1969). Conners' Abbreviated Teacher Rating Scale (ATRS), *composed of 10 items from the full 39-item measure* [italics added], has been used to assess hyperactivity most frequently." Note that the 1969 scale is cited but, in fact, the 10-item scale mentioned by O'Leary was not derived from the 1969 39-item scale.

Factor analyses of the TRS (1969) by other researchers (e.g., Werry, Sprague, & Cohen, 1975; Arias & O'Leary, 1984) yield different loadings, hence different combinations of items to be used for selection. Loney and Milich (1982) have seen fit to choose a different set of items from Conners to arrive at a more useful selection instrument. What on first blush appears to be one widely used diagnostic scale turns out instead to be a confused and confusing conglomerate of different scales that have failed to select homogeneous samples across sites.

It is our belief that the simplest way to emerge from the present morass of confusion that now obtains with respect to the very important teacher rating scales for ADD is that all Conners scales be abandoned. There is really no other way to guarantee correspondence in subject selection among various research groups, not to mention accurate delineation of the characteristics of the subjects. It is, not surprisingly, our recommendation that the research and clinical community switch to ACTeRS—a scale that is psychometrically sound (Ullmann et al., 1984a) and convenient to use, one that has demonstrated its usefulness as a clinical and research tool and its stability over three replications of a dose-response study with 86 ADD-H children (Ullmann & Sleator, 1984). This solution has been suggested by colleagues who generously agreed to give feedback on an earlier version of this paper.

One must be concerned about the possibility that research results may have been influenced by the widespread inappropriate use of 15 as a cutoff point for subject selection. At the time the Conners scales were developed in the early 1970s, they were an innovative advance, but progress in understanding since that time has made necessary new diagnostic tools.

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