# Reliability Testing of a Children's Version of the Eating Attitude Test

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**Abstract.** To study eating disorders in children, a measurement of children's eating attitudes must be available. Adolescents and adults are commonly surveyed with the Eating Attitude Test (EAT), but it is incomprehensible to children. A children's version of the EAT (ChEAT) was designed and tested on 318 children aged 8 through 13 years. Test-retest and internal reliability coefficients of the ChEAT were comparable to published studies with adults. Almost 7% of the children scored within the anorectic range on the ChEAT, closely matching the percentage reported for adolescents and adults on the EAT. *J. Am. Acad. Child Adolesc. Psychiatry*, 1988, 27, 5:541–543. **Key Words:** Eating Attitudes Test, young children, test-retest, internal reliability, validity.

Surveys of adolescents and young adults indicate a high frequency of abnormal eating behaviors. The age of onset for these eating disorders remains unclear. In one survey, adolescents reported they had started dieting as early as 8 years of age (Olsen, 1984). In order to document the development of disordered eating in children, a measurement of children's eating attitudes and behaviors must be available.

The Eating Attitude Test (EAT) (Garner and Garfinkle, 1979; Pumariega and LaBarera, 1986) and the Eating Disorders Inventory (EDI) (Garner et al., 1983a; Yager et al., 1987) are self-report inventories used to assess eating attitudes in adults and adolescents (Maloney and Shepard-Spiro, 1983; Raciti and Norcross, 1987).

The youngest age group on which the EAT or EDI has been used in published studies was a sample of 15-year-old girls (Mann et al., 1983), probably because the EAT and EDI are incomprehensible to young children. Consequently, a version of the EAT, the Children's Eating Attitude Test (ChEAT), was designed for use with children aged 8 through 13 and assessed for reliability. Since the EDI is covered by copyright, it cannot be altered for children.

## Method

### *Measures*

The Eating Attitude Test (EAT) is a 40-item, 6-point, forced choice, self-report inventory that measures dieting behaviors, food preoccupation, anorexia, bulimia, and concerns about being overweight. The EAT has demonstrated concurrent and predictive validity as well as reliability (Garner et al., 1983b). After performing factor analysis on the EAT, Garner et al. (1982) found that 14 of the 40 EAT questions did not load on any of the three factors. Eliminating these questions left the EAT-26, which was highly predictive of the total EAT-40 ($r = 0.98$). It showed high reliability for the anorexic group (alpha of 0.90), as well as validity compared to structured interviews when scores $\geq 20$ were taken as suggestive of anorexia nervosa (Berland et al., 1986; Garner et al., 1982).

The EAT discriminates between normal dieters and individuals with obesity, anorexia, and bulimia (Garner et al., 1985; Williams et al., 1986). It appears to be the best available inventory for assessing abnormal eating attitudes and behaviors.

Trial testing, however, showed that questions on the EAT-26 are worded in ways that make them incomprehensible to children. Therefore, some words were simplified, e.g., "terrified" was changed to "scared," and "preoccupied with" was reworded "think a lot about." The few changes involved substituting simpler synonyms for words in questions where trial subjects or three consulting developmental specialists indicated the original words were too difficult for third or fourth graders. The 26 questions on the children's version of the EAT-26 appear in the Appendix.

### *Subjects*

The 1980 census statistics from the Cincinnati Chamber of Commerce were used; all public elementary schools ranked in the "middle to upper socioeconomic level" were eligible for the study. From this pool, two elementary schools were randomly chosen. The neighborhoods of the two schools are mostly white, and the two schools are similar academically and socioeconomically to the other schools in the pool. A total of 356 students in the third through sixth grade were eligible to participate; 318 were included in the data analysis. Seven children's parents refused to let them participate. Twelve children were excluded from data anaysis because of inconsistent answers on the questionnaire. Nineteen children were absent on the days of testing. The racial distribution of subjects was 92% white, 6% black, 1.5% oriental, and 0.5% Hispanic. Females comprised 53.3% of the sample. The ages ranged from 8 to 13 (only one 13-year-old). The mean age was 9.7, with a SD of 1.24.

### *Procedure*

A letter was mailed to the parents of each student, informing them of the purpose, procedure, and possible risks of the survey. If a parent did not consent to have a child participate,

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the parent returned the form to one of the authors (M. M.) or to the school, in accordance with the hospital Institutional Review Board. A 30-minute questionnaire containing the ChEAT and some demographic questions was administered to students during class time by one of us (J. M.). The directions were read to each class. Each question was read to the third graders to help focus their attention.

A retest was conducted 3 weeks after the initial survey to establish reliability. Test-retest was performed on one class in each grade.

To assess internal reliability, each question was correlated with the survey as a whole. Chronbach's alphas were computed on the sample as a whole and on each grade. An alpha level of 0.05 was considered significant for all data analysis.

## Results

Overall the students in grades 3 through 6 were able to answer the questionnaire in 35 minutes (including time for explaining directions). The students appeared cooperative, even enthusiastic about participating in the study. Some children giggled nervously at the questions about vomiting (see Appendix). They were not permitted to look at each other's papers or to talk to classmates during the survey. Nearly 7% of the children (6.8%) scored within the anorectic range (>20) on the ChEAT. The girls scored higher than the boys in each age category after grade 3.

### *Test-Retest Reliability*

The test-retest reliability correlation for the children's version of the EAT was 0.81 ($N = 68$). This compares favorably to the results in the literature. Test-retest coefficients are broken down by grade (see Table 1) and appear consistent across all grades.

### *Internal Reliability*

An internal reliability analysis was run on each question to determine its correlation with the survey as a whole. Question 19 on the ChEAT, "I can show self-control around food," was negatively correlated with the rest of the survey. Consequently, this question was taken out of the data analysis. Each instrument has built-in checks on the consistency of answers. Each subject's individual scores were assessed to determine whether he or she was answering consistently. If the subject answered inconsistently on more than one pair of questions, his or her questionnaire was excluded from the data analysis.

TABLE 1. *Test-Retest and Internal Reliability on the Children's Version of the Eating Attitude Test*[a]

| Grade | Subjects Surveyed | Subjects Retested | Test-Retest Reliability Scores | Internal Reliability Coefficients[b] |
|---|---|---|---|---|
| 3 | 85 | 17 | 0.84 | 0.80 |
| 4 | 83 | 21 | 0.88 | 0.77 |
| 5 | 75 | 13 | 0.75 | 0.68 |
| 6 | 74 | 17 | 0.85 | 0.76 |
| Total | 318 | 68 | 0.81 | 0.76 |

[a] Adapted from Garner and Garfinkle's Eating Attitude Test.
[b] Where coefficients are Chronbach's alphas.

After the internal reliability analysis was completed, Chronbach's alphas were done on the sample as a whole and on each grade. The children's version of the EAT proved to be reliable, with Chronbach's alphas of 0.76 for the total population of 318 subjects in this study. As demonstrated in the Table, the third graders and fourth graders were as reliable as the rest of the sample.

These $r$ values for internal reliability are comparable to the reliability studies of the EAT subscales in which Raciti and Norcross (1987) report $r = 0.90$ for the EAT. Although EAT scores in this study were somewhat less reliable than in the original studies, overall the present results point out that students in all four elementary grades answered consistently.

## Discussion

The high values for internal reliability, test-retest coefficients, and face validity seem to indicate that the ChEAT is a promising research instrument for the assessment of eating attitudes and dieting behavior in children as young as 8 years of age. One limitation of this study is the inclusion of third graders who may not have been able to read even this simplified version of the EAT. Both test-retest and internal reliability are high, however, when the questions were read to the third graders; these very young children were at least consistent.

A startling finding in this survey was the fact that nearly 7% of the children scored in the anorexia nervosa range, thus matching reports in the literature on adolescents and adults. This result may indicate that the authors' modification of the original EAT-26 has maintained that instrument's accuracy. Also, this sizable percentage of young children reporting disordered eating can be taken as an indication for increased research on the development of dieting behaviors and eating attitudes in young children.

Survey instruments such as the ChEAT do not establish the formal diagnosis of an eating disorder; however, such an instrument may be used to help assess food preoccupation, dieting patterns, and eating attitudes in young children. Future studies should include structured interviews of subjects who score in the anorectic range on the ChEAT to establish discriminant validity. Also, a clinical population of eating disordered children should be surveyed with this instrument. Perhaps further research will produce baseline data of children's eating attitudes to facilitate an understanding of the development of eating disorders. Such data could help in the early identification, improved prognosis, and possible prevention of eating disorders in children.

## Appendix

### *Children's Version of the Eating Attitude Test (26) (Garner et al., 1982)*

Instructions: Please place an X under the word which best applies to the statements below.

Sample item: I like to eat vegetables.

| Always | Very Often | Often | Sometimes | Rarely | Never |
|---|---|---|---|---|---|

Test:
1. I am scared about being overweight.
2. I stay away from eating when I am hungry.
3. I think about food a lot of the time.
4. I have gone on eating binges where I feel that I might not be able to stop.
5. I cut my food into small pieces.
6. I am aware of the energy (calorie) content in foods that I eat.
7. I try to stay away from foods such as breads, potatoes, and rice.
8. I feel that others would like me to eat more.
9. I vomit after I have eaten.
10. I feel very guilty after eating.
11. I think a lot about wanting to be thinner.
12. I think about burning up energy (calories) when I exercise.
13. Other people think I am too thin.
14. I think a lot about having fat on my body.
15. I take longer than others to eat my meals.
16. I stay away from foods with sugar in them.
17. I eat diet foods.
18. I think that food controls my life.
19. I can show self-control around food.
20. I feel that others pressure me to eat.
21. I give too much time and thought to food.
22. I feel uncomfortable after eating sweets.
23. I have been dieting.
24. I like my stomach to be empty.
25. I enjoy trying new rich foods.
26. I have the urge to vomit after eating.

## References


Berland, N. W., Thompson, J. K. & Linton, P. H. (1986), Correlation between the Eat-26 and the EAT-40, the Eating Disorders Inventory, and the Restrained Eating Inventory. *International Journal of Eating Disorders*, 5:569–574.

Garner, D. M. & Garfinkle, P. E. (1979), The eating attitudes test: an index of the symptoms of anorexia nervosa. *Psychol. Med.*, 9:273–279.

—— Olmsted, M. P., Bohr, Y. & Garfinkle P. E. (1982), The Eating Attitudes Test: psychosometric features and clinical correlates. *Psychol. Med.*, 12:871–878.

—— —— Polivy, J. (1983a), Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2:15–34.

—— Garfinkle, P. E. & Olmsted, M. P. (1983b), An overview of the sociocultural factors in the development of anorexia nervosa. In: *Anorexia Nervosa: Recent Developments in Research*, ed. P. Darby, P. Garfinkle, D. Garner & D. Coscina. New York: Alan R. Liss, pp. 65–82.

—— Garfinkel, P. E. & O'Shaughnessy, M. (1985), The validity of the distinction between bulimia with and without anorexia nervosa. *Am. J. Psychiatry*, 142:581–587.

Maloney, M. J. & Shepard-Spiro, P. (1983), Eating attitudes and behaviors of anorexia nervosa patients and their sisters. *Gen Hosp. Psychiatry*, 5:285–288.

Mann, A., Wakeling, A., Wood, K., Monck, E., Dobbs, R. & Szmukler, G. (1983), Screening for abnormal eating attitudes and psychiatric morbidity in an unselected population of 15-year-old school girls. *Psychol. Med.*, 13:573–580.

Olsen, L. (1984), *A Report On Teenagers' Eating Habits and Nutritional Status*. Oakland, Calif.: Citizens Policy Center.

Pumariega, A. J. & LaBarera, J. D. (1986), Eating attitudes and personality variables in a nonclinical sample. *International Journal of Eating Disorders*, 5:285–294.

Raciti, B. A. & Norcross, J. C. (1987), The EAT and EDI: screening, interrelationships, and psychometrics. *International Journal Eating Disorders*, 6:579–586.

Williams, R. L., Schaefer, C. A., Shisslak, C. M., Gronwaldt, V. H. & Comerci, G. D. (1986), Eating attitudes and behaviors in adolescent women: discrimination of normals, dieters, and suspected bulimics using the Eating Attitudes Test and the Eating Disorder Inventory. *International Journal of Eating Disorders*, 5:879–894.

Yager, J., Landsverk, J. & Edelstein, C. K. (1987), A 20-month follow-up study of 628 women with eating disorders, I: course and severity. *Am. J. Psychiatry*, 144:1172–1177.