What I Think and Feel: A Revised Measure of Children's Manifest Anxiety

Cecil R. Reynolds[1] and Bert O. Richmond
University of Georgia

The 1956 adaptation for children of Taylor's Manifest Anxiety Scale, the Children's Manifest Anxiety Scale, was revised to meet current psychometric standards. A 73-item revision draft was administered to 329 school children from grades 1 to 12. Based on item-analysis criteria for $r_{bis} \geqslant .4$ and $.30 \leqslant p \leqslant .70$, 28 anxiety items were retained along with 9 of the original 11 Lie scale items. A cross-validation sample of 167 children from grades 2, 5, 9, 10, and 11 produced a KR_{20} reliability estimate of .85. Anxiety scores did not differ across grade or race. Females scored significantly higher than males. For the Lie scale, significant differences appeared by grade and race. No sex differences were obtained on the Lie scale. The resulting scale appears useful for children in grades 1 to 12 and may aid in future studies of anxiety as well as assisting the clinician in the understanding of individual children.

An instrument to measure manifest anxiety in adults was first reported by Taylor (1951). This instrument was compiled from items drawn from the MMPI and was considered useful in identifying individuals characterized by chronic anxiety reactions. A few years later, Castaneda, McCandless, and Palermo (1956a) altered this scale and reported initial standardization data for a children's version of the Manifest Anxiety Scale. In concurrent articles, Castaneda, MacCandless, and Palermo (1956b) and Palermo, Castaneda, and McCandless (1956) also reported on the relationship between scores on the Children's Manifest Anxiety Scale (CMAS) and factors of task difficulty and complexity. During 20 years since the origination of this scale, well over 100 articles using the instru-

ment have appeared in the literature in an effort to define more accurately the nature and relationships of manifest anxiety in children to numerous cognitive, affective, achievement, and other variables.[2] Various investigators have sought to understand manifest anxiety in children and (1) socioeconomic background (e.g., Boyce, 1974; Ziv & Luz, 1973), (2) cultural differences (e.g., Ziv & Shauber, 1969; Muralidharan & Sharma, 1971), (3) specified stress situations (e.g., Melamed & Siegel, 1975; Donald, 1973), (4) achievement and intelligence (e.g., Chansky, 1966; Merryman, 1974), (5) self-concept and other personality variables (e.g., Brady, Richards, & Felker, 1975; Stanwyck & Felker, 1973), and (6) mental retardation (e.g., Carrier, Orton, & Malpass, 1962; Cochran & Cleland, 1963). The continuing interest in a scale to measure manifest anxiety in children is indicative of the significance of anxiety to a child's performance. Many writers, including Peck and Mitchell (1967), stress the importance of anxiety as one variable affecting individual achievement. More emphatically, Gaudry and Spielberger (1971) suggest the overwhelming weight of evidence consistently indicates a negative relation between anxiety and academic achievement.

There are several issues regarding the use of the present CMAS that suggest its revision. The use by B. O. R. of this instrument for more than a decade as a screening and clinical tool has made evident the need for its revision and further statistical interpretation. A frequent complaint of teachers administering the scale is that it does not poll enough areas of anxiety in children, and that some words are too difficult for primary grade children, slow learners, and the mentally retarded. These groups of children are often the ones whose level of anxiety we seek most to understand. Also, the teacher and researcher would like an instrument that could be used from first grade through high school in order to understand developmental changes in anxiety, as well as possible effects of treatment on level of manifest anxiety. An omnipresent concern of the teacher, the clinician, and the researcher is the efficiency of the measuring instrument. Keep it as brief as possible to do the job needed. A very strong criticism of the present CMAS derives from data provided by Flanigan, Peters, and Conry (1969). These authors provide data that indicate that only 12 of the 42 items of the anxiety scale actually meet the criteria of a good test item. These criteria of item difficulty between .30 and .70, biserial correlation between an item and the total test of at least .30, and X_{50} values in the range of ±1.5 deviation units from the mean of zero were met only by the following items: 16, 24, 25, 27, 29, 31, 32, 35, 38, 45, 50, 53. Interestingly, Flanigan et al. (1969) also report that 22 of the items meet the specified criteria when the instrument is used with a sample of mentally retarded pupils.

The use of classic psychometric standards in the production of objective personality tests is desirable for several reasons. If performance on the test is

---

[2] A bibliography of research utilizing the CMAS is available from C.R.R. on request.

considered a result of an underlying trait of the individual, the probability of marking a particular item can be considered a function of the individual's position on a continuum of the underlying trait. Standard item analysis procedures result in increased accuracy of measurement throughout the range of scores and ensure the measurement of a single trait, in this case, anxiety. However, standard procedures may result in the elimination of infrequently checked pathognomic items that could be important in the delineation of psychoses and other severe deviances. Standard psychometric procedures were adopted in the present study because of the target population (school children), the desire for an instrument accurate enough to be useful to anxiety researchers as well as the clinician, and because the original CMAS was derived from an instrument based on a trait theory of anxiety.

The major purpose of the present study is to revise the CMAS in order to (1) lessen the administration time if feasible, (2) increase clarity of the items and lower the reading level so that it could be suitable for primary grade children, and (3) select items for the anxiety scale that meet criteria as stringent as those proposed by Flanigan et al. (1969).

METHOD

Subjects

Participants for the study were 329 school age children in grades 1 through 12. The sample distribution by grade is presented in Table II and by sex and race in Table III. All were tested on the same day at their respective school in a small urban community in the southeastern United States. A second group of 167 children from grades 2, 5, 9, 10, and 11 were also tested once the instrument was finalized to cross-validate reliability. The second group was chosen from a different school district of the same state. Although the researchers were not allowed to collect SES data, the school districts did agree to random selection of the classes at each grade level.

Test Instrument

A panel of experienced teachers and clinicians were asked to review the original CMAS and suggest indicators of manifest anxiety in children not covered by the scale. This resulted in an additional 20 items, such as "I wake up scared some of the time" and "I don't remember things too well." The resulting 73 items were then submitted to a group of reading specialists to obtain word difficulty suitable for first grade children. The reading specialists advised a reading level about third grade so that the test could then be read to first and second

Table I. Items and Item Statistics, p and r_{bis}, for All Anxiety and Lie Items Retained on the Revision of the CMAS

Item number	Item[a] type	Item	p[b]	r_{bis}[b]
1	A	I have trouble making up my mind.	69	46
2	A	I get nervous when things do not go the right way for me.	61	47
3	A	Others seem to do things easier than I can.	60	41
4	L	I like everyone I know.	55	18
5	A	Often I have trouble getting my breath.	33	47
6	A	I worry a lot of the time.	45	50
7	A	I am afraid of a lot of things.	44	52
8	L	I am always kind.	35	10
9	A	I get mad easily.	45	50
10	A	I worry about what my parents will say to me.	63	47
11	A	I feel that others do not like the way I do things.	50	43
12	L	I always have good manners.	43	09
13	A	It is hard for me to get to sleep at night.	48	50
14	A	I worry about what other people think about me.	52	45
15	A	I feel alone even when there are people with me.	30	43
16	L	I am always good.	28	15
17	A	Often I feel sick in my stomach.	67	52
18	A	My feelings get hurt easily.	46	60
19	A	My hands feel sweaty.	44	42
20	L	I am always nice to everyone.	34	21
21	A	I am tired a lot.	55	57
22	A	I worry about what is going to happen.	70	56
23	A	Other children are happier than I.	39	44
24	L	I tell the truth every single time.	23	19
25	A	I have bad dreams.	50	61
26	A	My feelings get hurt easily when I am fussed at.	64	47
27	A	I feel someone will tell me I do things the wrong way.	50	49
28	L	I never get angry.	55	25
29[c]	A	I wake up scared some of the time.	39	53
30	A	I worry when I go to bed at night.	35	61
31	A	It is hard for me to keep my mind on my schoolwork.	38	52
32	L	I never say things I shouldn't.	44	24
33[c]	A	I wiggle in my seat a lot.	51	40
34	A	I am nervous.	36	50
35[c]	A	A lot of people are against me.	33	42
36	L	I never lie.	40	13
37	A	I often worry about something bad happening to me.	67	59

[a] A = Anxiety Scale; L = Lie Scale.
[b] Decimals omitted, all signs are positive.
[c] New test item.

grade children. The average third grade reader would then be able to complete the instrument alone. Some changes in the original CMAS resulted, such as the substitution of *bathroom* for *toilet* in item 23 and the elimination of *secretly* in item 11. The few changes in wording generally reflect some changes in English usage over the past 20 years, and other changes perhaps colloquial to the Southeast (see Table I for the complete revised CMAS). The instrument was given the more innocuous title of "What I Think and Feel."

Procedure

During the early spring, all individuals completed the 73-item revised draft of the CMAS. Administration time ranged from 45 minutes at the grade 1 level to about 20 minutes for grades 6 and above. For grades 1 and 2 the children's classroom teacher read each item and repeated the last two sentences of the directions printed at the top of the scale after each question. Actual directions on the scale were: "Read each question carefully. Put a circle around the word YES if you think it is true about you. Put a circle around the word NO if you think it is not true about you." Beginning with grade 3, students read each question and were monitored carefully to give explanation of words they did not read or understand. The average third grade reader had little difficulty with any items.

Data Analysis

Following Guilford (1954), Flanigan et al. (1969), Ebel (1965), and the APA guidelines for psychological tests, two item statistics were computed for each of the 73 test items: (1) the difficulty index, p, and (2) biserial correlation of the item to total test score, r_{bis}. All items, with the exception of the Lie scale, that did not meet both criteria of $.3 \leqslant p \leqslant .7$, and $r_{bis} \geqslant .4$, were eliminated from the Anxiety scale. Lie items that correlated .30 or higher with the Anxiety scale or failed to correlate significantly with any other Lie scale item were eliminated.

Following the selection of items for inclusion on the revised form of the CMAS, means and standard deviations were computed by grade, race, and sex for the anxiety and Lie scales. Anxiety and Lie scale scores were then submitted to a three-way ANOVA and the variances to separate F tests. Duncan's multiple range test was performed on scores by grade. Since reliability estimates may be spuriously inflated when based on the same sample as the item analyses, a group of 167 pupils from a separate district were tested with the new instrument for the expressed purpose of computing a reliability estimate.

RESULTS

Item Analyses

A total of 28 anxiety items and 9 Lie items were retained from the 73-item draft. Item statistics for the anxiety scale items retained are presented in Table I. These items yield a KR_{20} reliability estimate of .83 with the item selection sample. The testing of the second group of 167 students yielded a KR_{20} reliability estimate of .85.

Table II. Means and Standard Deviations of An-
xiety and Lie Scale Scores Obtained on the Revi-
sion of the CMAS by Grade

| Grade | Anxiety scale | | | Lie scale | |
	$\overline{X}$	SD	N	$\overline{X}$	SD
1	13.70	4.85	23	6.00	1.95
2	16.13	6.42	30	4.63	2.55
3	12.78	6.50	32	3.97	2.18
4	16.64	5.70	28	2.25	1.65
5	12.52	5.33	33	2.70	2.47
6	13.82	5.28	28	4.18	2.04
7	11.85	5.27	26	1.93	1.67
8	14.50	5.22	30	2.57	1.87
9	13.25	6.27	40	3.70	1.84
10	13.23	5.85	22	3.68	2.48
11	13.96	5.87	28	3.68	2.75
12	13.67	4.58	9	4.33	2.29
Totals	13.84	5.79	329	3.56	2.37

Lie scale item statistics are also presented in Table I. Biserial correlations appearing in Table I are for the Lie items with the total anxiety scale score. Two Lie items were eliminated. Item 10 on the original CMAS, "I would rather win than lose in a game," failed to correlate significantly with any other Lie item. Item 49 on the original CMAS, "It is good to get high grades in school," also failed to correlate significantly with any other Lie item *and* correlated above .30 with the anxiety scale. The resulting manifest anxiety scale in Table I was labeled What I Think and Feel.

Normative Data

Using the 37 items retained in the revised anxiety scale, 28 anxiety items and 9 Lie items, means, and standard deviations were computed separately by grade (Table II), race, and sex (Table III). The 28 anxiety items yielded a total group mean of 13.84 with a SD of 5.79. The 9 Lie items yielded a total group mean of 3.56 with a SD of 2.37. The anxiety scale correlated significantly with the Lie scale, $r(327) = .15; p \leqslant .01$.

Group Differences

Anxiety Scale. Based on the results of Hartley's Fmax significance test for homogeneity of variance (Kirk, 1968), no significant differences were found between variances on the anxiety variable by grade or sex. Whites exhibited signifi-

Table III. Means and Standard Deviations of Anxiety and Lie Scores Obtained on the Revision of the CMAS by Race and Sex

	Anxiety scale			Lie scale	
	$\overline{X}$	SD	N	$\overline{X}$	SD
Sex					
Females	14.97	5.60	173	3.66	2.45
Males	12.58	5.75	156	3.45	2.28
Race					
Blacks	14.09	5.30	172	4.02	2.09
Whites	13.56	6.29	157	3.06	2.56

greater variance in anxiety scores than did Blacks, Fmax (171, 156) = 1.40; $p \le .05$. Although this violates the homoscedasticity assumption for the ANOVA, given the relatively large sample employed and the small actual difference between the two variances, it is unlikely the ANOVA is affected as it is a robust statistic under these conditions (McCall, 1975). Should this relationship appear in future research it may prove an interesting variable, quite worthy of study.

A three-way ANOVA was computed by grade, race, and sex for the anxiety scale. No significant effect was found by grade or race. However, females scored significantly higher than males, $F(1,283) = 10.87; p \le .001$. No significant two-way or three-way interactions appeared on the anxiety variable.

Lie Scale. Hartley's Fmax significance test for homogeneity of variance showed no significant differences occurring between variances on the Lie scale by grade or sex. As was true with the anxiety scale, Whites exhibited significantly greater variance in Lie scores than did Blacks, Fmax (171, 156) = 1.49; $p \le .05$. As above, the small actual difference is unlikely to have inflated the F ratios for the ANOVA due to the large sample size and small actual difference.

Table IV. ANOVA Summary Table for Analysis of Lie Scores by Grade, Race, and Sex

Source	SS	df	MS	F
Grade	295.57	11	35.96	8.79[a]
Sex	.94	1	.94	.23
Race	105.27	1	105.27	25.73[a]
Grade by sex	42.10	11	3.83	.94
Grade by race	147.35	11	13.40	3.28[a]
Sex by race	2.10	1	2.10	.51
Grade by sex by race	27.18	9	3.02	.74
Error	1157.61	283	4.09	

[a]$p \le .001$.

A three-way ANOVA was computed by grade, race, and sex for the Lie scale scores. As indicated in Table IV, significant main effects occurred for grade and race. No sex differences appeared and only one interaction term, grade by race, proved significant. The main effect for grade shows that children in grade 1 scored significantly higher than children in all other grades with the exception of grades 2 and 12 (Duncan procedure, $p \leqslant .05$). Children in grades 7 and 4 obtained significantly lower scores than children in all other grades with the exception of grades 5 and 8 ($p \leqslant .05$). Blacks scored significantly higher than Whites on the Lie variable.

.

DISCUSSION

The revision of the CMAS presented herein represents a 33% reduction in length of the scale while not appreciably affecting reliability. Reliability estimates obtained here, .83 with the item selection sample and .85 with a cross-validation group, are quite comparable to reliability coefficients reported by Kitano (1960) of .86, by Finch, Montgomery, and Deardoff (1974) of .77, and by Allison (1970) of .84 for boys and .88 for girls. The reduction in administration time may also make the instrument more attractive to the researcher, the clinician, and possibly the school psychologist as a group screening instrument. Due to the relatively high Lie scale scores of the first grade children, caution should be exercised when using the instrument with such young children. It may be advisable to await validity data obtained on both first and second grade children before placing clinical significance on scores for these grades.

While direct evidence of validity is lacking in this initial study, several indirect as well as rational indicators of validity are available. Twenty-five of the 28 anxiety items were retained from the original CMAS. The three remaining items were all judged by a group of teachers and clinicians to be indicative of anxiety. The finding that females display greater anxiety than males is consistent with previous research utilizing the original CMAS (Bledsoe, 1973; Castaneda et al. 1956a) and several other well-known anxiety scales (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960). Although grade differences in anxiety did not appear in this sample as it has in some previous research (Bledsoe, 1973), Castaneda et al. (1956a) failed to find grade effects in the original adaptation of the CMAS, thus indicating some controversy. The present study does not preclude the existence of anxiety differences across grades The large number of grades sampled, 12, may have masked differences between individual grades. The overall trend was for anxiety scores to decrease somewhat with age, a finding consistent with previous CMAS data. However, evidence of discriminant validity will be necessary for the revised instrument.

Current evidence suggests the instrument may be used readily at grade 3 or above. It is suggested that scores within one *SD* of the mean at the appropriate

grade level be taken to indicate scoring within the normal range of variability. However, if Sarason et al. (1960) are correct in speculating that females merely admit anxiety more freely than males, the sex norms in Table III may be more appropriate.

Previous research on the Lie scale of the CMAS suggests that a high score may be indicative of a personality characteristic of the child rather than of a lack of validity of the child's score. Specifically, a high Lie score is often taken as an indication of defensiveness. With younger children a high score may be interpreted as a measure of social desirability, which could account for the high scores of the grade 1 pupils. It is not quite clear why the population examined here scored lower on the Lie scale at grades 4, 5, 7, and 8. The difference may reflect a unique characteristic of this sample. If it is found typical of children at these grade levels, it could be useful information in educational programming. A high Lie score (6 or higher) may also indicate acquiescence when accompanied by an extremely high anxiety score (i.e., two or more SDs above the mean). While this would invalidate the anxiety score, it still provides the clinician with useful information about the child's personality.

In essence, the study has provided a refinement of the original CMAS on more precise psychometric bases. The resulting instrument, What I Think and Feel, appears to be a reliable measure of anxiety in children. The instrument is more succinct and the word difficulty of items makes it readily useful in grades 3 to 12, and probably satisfactory in grades 1 and 2, or with pupils functioning intellectually at least at the first grade level. Additional study is needed and currently planned to determine the validity of the instrument and its generalizability to populations other than the one used in the initial standardization.

REFERENCE NOTE

1. Stanwyck, D. J., & Felker, D. W. *Intellectual achievement, responsibility, and anxiety as functions of self-concept of third to sixth grade boys and girls.* Paper presented at AERA, New York, 1973.

REFERENCES

Allison, D. E. Test anxiety, stress, and intelligence-test performance. *Canadian Journal of Behavioral Science*, 1970, *2*(11), 26-37.

American Psychological Association. *Standards for educational and psychological tests.* Washington, D. C., 1974.

Bledsoe, J. C. Sex and grade differences in children's manifest anxiety. *Psychological Reports*, 1973, *32*, 285-286.

Boyce, M. W. Student teacher misconceptions of manifestations of anxiety in children from different socio-economic/ethnicity backgrounds. *Australian and New Zealand Journal of Sociology*, 1974, *10*(2), 138-139.

Brady, P. J., Richards, J. P., & Felker, D. W. Affective outcomes of evaluation strategies by self and another in children's learning from textbook material. *Psychological Reports*, 1975, *37*(1), 311-317.

Carrier, N. A., Orton, D. D., & Malpass, L. F. Responses of bright, normal, and EMR children to an orally-administered Children's Manifest Anxiety Scale. *Journal of Educational Psychology*, 1962, *53*, 271-274.

Castaneda, A., McCandless, B. R., & Palermo, D. S. The children's form of the manifest anxiety scale. *Child Development*, 1956, *27*(3), 317-326. (a)

Castaneda, A., Palermo, D. S., & McCandless, B. R. Complex learning and performance in children as a function of anxiety in children and task difficulty. *Child Development*, 1956, *27*(3), 327-332. (b)

Chansky, N. M. Anxiety, intelligence, and achievement in algebra. *Journal of Educational Research*, 1966, *60*, 90-91.

Cochran, I. L., and Cleland, C. C. Manifest anxiety of retarded and normals matched to academic achievement. *American Journal of Mental Deficiency*, 1963, *67*, 539-542.

Donald, D. R. Anxiety in the relationship of group-acceptance to the academic achievement of pre-adolescents. *Psychologia Africana*, 1973, *15*, 1-6.

Ebel, R. L. *Measuring educational achievement.* Englewood Cliffs, New Jersey: Prentice-Hall, 1965.

Finch, A. J., Montgomery, L. E., & Deardoff, P. A. Children's Manifest Anxiety Scale: Reliability with emotionally disturbed children. *Psychological Reports*, 1974, *34*, 68.

Flanigan, P. J., Peters, C. J., & Conry, J. L. Item analysis of the Children's Manifest Anxiety Scale with the retarded. *Journal of Educational Research*, 1969, *62*(10), 472-477.

Gaudry, E., & Spielberger, D. *Anxiety and educational achievement.* Sydney, Australia: Wiley, 1971.

Guilford, J. P. *Psychometric methods* (2nd ed.). New York: McGraw-Hill, 1954.

Kirk, R. E. *Experimental design: Procedure for the behavioral sciences.* Belmont California: Brooks/Cole, 1968.

Kitano, H. L. Validity of the Children's Manifest Anxiety Scale and the modified revised California inventory. *Child Development*, 1960, *31*, 67-72.

McCall, R. B. *Fundamental statistics for psychology* (2nd ed.). Atlanta: Harcourt Brace Jovanovich, 1975.

Melamed, B. G., & Siegel, L. J. Reduction of anxiety in children facing hospitalization and surgery by use of filmed modeling. *Journal of Consulting and Clinical Psychology*, 1975, *43*(4), 511-521.

Merryman, E. P. The effects of manifest anxiety on the reading achievement of fifth grade students. *Journal of Experimental Education*, 1974, *42*(3), 36-41.

Muralidharan, R., & Sharma, A. Manifest anxiety in Indian (Delhi) children. *Indian Educational Review*, 1971, *6*(2), 67-68.

Palermo, D. S., Castaneda, A., & McCandless, B. R. The relationship of anxiety in children to performance in a complex learning task. *Child Development*, 1956, *27*(3), 333-337.

Peck, R. F., & Mitchell, J. V. *Mental health: What research says to the teacher.* Washington, D. C.: National Educational Association of Classroom Teachers, 1967.

Sarason, S. B., Davidson, K. S., Lightthall, F. F., Waite, R. R., & Ruebush, B. K. *Anxiety in elementary school children.* New York: Wiley, 1960.

Taylor, J. A. The relationship of anxiety to the conditioned eyelid response. *Journal of Experimental Psychology*, 1951, *42*, 183-188.

Ziv, A., & Luz, M. Manifest anxiety in children of different socioeconomic levels. *Human Development*, 1973, *16*(2), 24-32.

Ziv, O., & Shauber, H. Contribution to a cross-cultural study of manifest anxiety in children. *Human Development*, 1969, *12*, 178-191.