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Assessment of Anxiety and Achievement in Kindergarten and First- and Second-Grade Children

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The psychometric properties of the State-Trait Anxiety Inventory for Children (STAIC) and relationships between STAIC T-Anxiety scores and standardized measures of achievement were determined for 948 kindergarten and first- and second-grade children. The T-anxiety scores of kindergarten children were lower than those of first- and second-graders. Internal consistency of the STAIC scales was higher in individual testing sessions than in small group administrations. Small but significant negative correlations were found between STAIC T-Anxiety scores and measures of school achievement. It was concluded that the STAIC is a potentially useful measure of state and trait anxiety in kindergarten through sixth-grade children, but it must be administered individually at the kindergarten and first-grade levels.

Anxiety is a fundamental human emotion and a central problem in most psychoneurotic and psychosomatic disorders. The importance of distinguishing between anxiety as an emotional state and individual differences in anxiety as a personality trait was first noted by Cattell more than two decades ago (Cattell & Scheier, 1961) and is now generally accepted by anxiety researchers (see Spielberger, 1983, 1984). State anxiety (S-Anxiety)

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has been defined as a transitory emotional condition that consists of feelings of tension, apprehension, nervousness, and worry, and heightened activity of the autonomic nervous system (Spielberger, 1966, 1972). Trait anxiety (T-Anxiety) refers to individual differences in anxiety-proneness – i.e., relatively stable differences in the disposition to perceive evaluative situations as threatening, and to respond to threats to self-esteem with elevations in S-Anxiety.

Evaluative conditions that involve perceived psychological threats to self-esteem (e.g., taking tests, giving oral reports, receiving feedback) are more likely to cause individuals with high T-Anxiety to show decrements in performance than persons who are low in T-Anxiety (Spielberger, 1966, 1979). Given the evaluative orientation in most school settings, high T-Anxiety children more often experience S-Anxiety reactions that adversely influence academic performance than do children who are low in T-Anxiety (Papay, Costello, Hedl, & Spielberger, 1975).

Two self-report anxiety measures, the Children's Manifest Anxiety Scale (CMAS; Castaneda, McCandless, & Palermo, 1956) and the General Anxiety Scale for Children (GASC; Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960), were developed more than 25 years ago to assess anxiety in elementary school children and appear to be valid measures of T-Anxiety. More recently, the State-Trait Anxiety Inventory for Children (STAIC) was constructed to measure both trait and state anxiety in fourth-, fifth-, and sixth-grade children; norms for these grade levels are reported in the *STAIC Preliminary Manual* (Spielberger, 1973). The STAIC T-Anxiety scale was found to correlate .75 and .63, respectively, with the CMAS and GASC.

Over the past decade, the STAIC has been used extensively[2] to assess state and trait anxiety in 9- to 12-year-old normal and disturbed children (e.g., Finch & Nelson, 1974; Papay et al., 1975). The main goal of the present study was to determine if the STAIC could be extended downward to assess anxiety in kindergarten and first- and second-grade schoolchildren and to examine the psychometric properties of the STAIC for these grade levels. A second goal was to evaluate the relationship between STAIC T-Anxiety scores and standardized measures of academic achievement. The psychometric properties of the STAIC when given in individual and small group administrations to first- and second-graders were also evaluated.

METHOD

Subjects

The research sample consisted of 948 kindergarten and first- and second-grade children randomly selected from 30 elementary schools in a

large metropolitan school district. Approximately equal numbers of children were selected from each school. Although the 30 schools represented a wide spectrum of socioeconomic levels, most of the children came from economically deprived families.

Test Instruments

Anxiety Measures. The State-Trait Anxiety Inventory for Children (STAIC) consists of separate 20-item self-report rating scales for measuring state and trait anxiety (Spielberger, 1973). The S-Anxiety scale assesses the *intensity* of a child's feelings of tension, apprehension, nervousness, and worry at a given time. Each S-Anxiety item begins with the stem "I feel," followed by three alternative endings containing a key descriptive term, e.g., "worried." The child responds by checking the alternative that best describes how he/she feels "right now, at this very moment," for example (Item 9): "I feel—very worried—worried—not worried."

The STAIC T-Anxiety scale requires children to report how they *generally* feel by indicating, on a 3-point rating scale, the frequency of occurrence of the behavior described by each item. For example, in responding to Item 11 ("I worry about school"), the child responds by checking "hardly ever," "sometimes," or "often." Evidence of the reliability (internal consistency) and the concurrent and construct validity of the STAIC S-Anxiety and T-Anxiety scales are reported in the STAIC Manual (Spielberger, 1973).

Achievement Tests. Two nationally normed, group-administered achievement tests were employed: The California Achievement Test (CAT) and the Metropolitan Readiness Test (MRT). These standardized measures are widely used in assessing the school readiness and achievement of children in kindergarten and the early elementary grades.

Procedure

The STAIC was administered with standard instructions to kindergarten and first- and second-grade children during the last 2 months of the academic year by substitute teachers with experience and certification at the elementary school level. Prior to the beginning of the study, the examiners were carefully trained in the administration of the test instruments.

All kindergarteen children were tested individually. The first- and second-graders were either tested individually or in small groups of five to seven children. Project assistants brought the children from their classrooms to the examination rooms. At the beginning of the testing session, the ex-

aminer explained that she was going to ask some questions about schoolwork. The STAIC S-Anxiety and T-Anxiety scales were then presented orally with standard instructions. At the conclusion of the testing session, the examiner thanked the children for their participation and the project assistants escorted them back to their classrooms.

The achievement tests were administered by the children's regular classroom teachers during homeroom or study hall periods. These tests were given during the same week as the STAIC scales in conjunction with a system-wide testing program. The MRT was administered to the kindergarten and first-grade children; the CAT was administered to the second-graders.

RESULTS

The STAIC test scores for the kindergarten and first- and second-grade children were evaluated by gender, grade level, and type of test administration. Table I presents the STAIC T-Anxiety and S-Anxiety means and standard deviations for the individual and small group administrations. The number of pupils in each of these groups and the corresponding alpha coefficients are also reported in this table.[3]

For the STAIC T-Anxiety scale, inspection of Table I and the statistical analyses of these data revealed four major findings. First, the mean T-Anxiety scores for the kindergarten children of both sexes were significantly lower than those of first-graders (males: $t(162) = 1.97, p < .05$; females: $t(194) = 2.95, p < .01$) and second-graders (males: $t(153) = 2.39, p < .01$; females: $t(174) = 2.73, p < .01$). Second, the mean T-Anxiety scores for the individual and small group administrations for first- and second-graders were similar (all critical ratios, $p < 1.0$). Third, there were no significant gender differences in T-Anxiety for either the individual or small group test administrations (all critical ratios, $p < 1.0$). Finally, under both types of test administration, the T-Anxiety alpha reliability coefficients were generally satisfactory for both sexes. As can be noted in Table I, all of the T-Anxiety alphas were .79 or greater, with a median alpha of .875.

For the STAIC S-Anxiety scale, no significant differences were found in either testing condition for the kindergarten and first- and second-grade boys, but the mean S-Anxiety scores of the first-grade girls were significantly higher than those of second-grade girls in both the individual ($t(240) =$

[3]Normalized T scores and percentile ranks for the STAIC S-Anxiety and T-anxiety scales for kindergarten and first- and second-grade children may be obtained by writing to the first author. Item-remainder correlations for each individual STAIC S-Anxiety and T-Anxiety item are also available on request.

Table I. Means, Standard Deviations, and Alpha Coefficients for Individual and Small Group Administration of the STAIC T-Anxiety and S-Anxiety Scales by Sex and Grade Level

	T-Anxiety				S-Anxiety			
	Individual		Small group		Individual		Small group	
Grade	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
Second								
Mean	39.83	39.11	40.33	40.13	32.35	31.39	32.76	31.64
SD	7.29	6.25	7.03	6.53	4.75	5.25	6.13	6.34
Alpha	.84	.82	.84	.79	.74	.76	.70	.74
N	102	110	139	138	102	110	139	138
First								
Mean	38.70	39.43	38.73	37.39	32.18	33.18	34.78	36.37
SD	8.20	8.09	8.49	9.82	5.28	4.96	5.72	4.76
Alpha	.89	.89	.89	.92	.75	.71	.62	.36
N	111	130	51	52	111	130	51	52
Kindergarten								
Mean	35.44	39.90	—	—	32.43	32.83	—	—
SD	7.99	7.54	—	—	4.96	5.05	—	—
Alpha	.88	.87	—	—	.72	.76	—	—
N	51	64	—	—	51	64	—	—

Table II. Correlations of the STAIC T-Anxiety Scale with Measures of Achievement for Elementary School Children

Grades	Males	Females
Second (CAT)	$-.23^b$	$-.13^b$
First (MRT)	$-.27^b$	$-.09$
Kindergarten (MRT)	$-.22^a$	$-.27^a$

$^a p < .05$.
$^b p < .01$.

2.96, $p < .01$) and small group testing conditions ($t(190) = 3.94$, $p < .01$). There were no differences between the individual and small group administrations for the second-graders, but first-grade children had higher mean S-Anxiety scores when tested in small groups than when tested individually (males: $t(162) = 2.00$, $p < .05$; females: $t(182) = 2.90$, $p < .05$).

In the individual testing conditions, the alpha coefficients for the S-Anxiety scale were somewhat lower than for the T-Anxiety scale but were generally satisfactory, ranging between .71 and .76. For the small group administration, the alphas for the second-graders were satisfactory (.70 or higher), but the alphas for the first-grade children were only .62 and .36. Thus, when it was administered to small groups of first-graders, the poor internal consistency of the STAIC S-Anxiety scale suggested that these children must be tested individually.

In computing the correlations between the STAIC T-Anxiety scores and the achievement measures, the data for the first- and second-graders tested individually or in small groups were combined.[4] The negative correlations that were found for both boys and girls at each grade level are presented in Table II. It may be noted that five of the six correlations were statistically significant, and that the pattern of correlations was somewhat different for boys and girls. For the boys, the magnitude of the inverse relationship between T-Anxiety and achievement was approximately the same at all three grade levels. For the kindergarten girls, the negative correlation between T-Anxiety and achievement was about the same as for the boys. This correlation was smaller for the second-grade girls and not statistically significant for the first-grade girls.

[4]State anxiety fluctuates over time as a function of situational stress. Since the STAIC S-Anxiety scores and the achievement measures were obtained during different testing sessions, examination of the relationship between these measures was considered inappropriate.

DISCUSSION

The trait anxiety scores of the kindergarten children in this study were significantly lower than those of the first- and second-graders, who did not differ from each other. One interpretation of this finding is that early school experiences evoke elevations in S-Anxiety, which eventually result in higher T-Anxiety. However, since enrollment in kindergarten was not mandatory for the school district in which the study was carried out, it was also possible that the children who entered school at the kindergarten level were lower in T-Anxiety than those who entered in the first grade. In order to determine whether T-Anxiety actually increases from kindergarten to the first grade, a longitudinal study will be required in which the same children are retested at each grade level.

The higher mean S-Anxiety scores and lower alpha coefficients of the first-grade children, especially in the small group administration, may reflect the difficulty experienced by these children in responding to the test instrument itself. Higher levels of S-Anxiety are typically evoked by complex or difficult tasks (e.g., Spielberger, O'Neil, & Hansen, 1972). Since the alpha coefficients of the first-grade children were much higher for the T-Anxiety scale than for the S-Anxiety scale, we may speculate that the concept of frequency embodied in the T-Anxiety measure is acquired at a developmentally earlier age than the concept of intensity on which the assessment of S-Anxiety is based.

STAIC T-Anxiety scores were found to be inversely related to academic achievement for boys at the kindergarten and first- and second-grade levels, and similar but weaker negative relationships were found for females. The finding that higher anxiety was associated with poorer achievement in young children was consistent with results previously reported by Finch, Pezzute, Montgomery, and Kemp (1974), who found that emotionally disturbed children were characterized by poorer academic performance. Similar findings have also been reported for college students (Spielberger, 1962).

The internal consistency of the STAIC T-Anxiety scale was generally satisfactory at all grade levels (median alpha = .875). Indeed, the T-Anxiety alpha coefficients for the kindergarten and first- and second-grade children in the individual testing condition of this study compared favorably with those reported for upper-level elementary school children in the STAIC Test Manual (Spielberger, 1973). The alpha coefficients obtained for the STAIC S-Anxiety scale in this study were somewhat lower than those reported for older children and adults (Spielberger, 1973, 1983), but the internal consistency of this scale was acceptable when it was administered individually at all grade levels, and when administered to small groups of second-grade children. The low alphas obtained in the group administration of the STAIC S-Anxiety scale to first-

graders clearly indicates that only individual testing procedures should be employed with kindergarten and first-grade children.

The STAIC was originally constructed and standardized for fourth-, fifth-, and sixth-grade elementary school children (Spielberger, 1973) and has been shown to have acceptable psychometric properties for group administration at the third-grade level (Papay & Hedl, 1978). The results of the present study provide evidence that the STAIC can also be group-administered to measure state and trait anxiety in second-graders, and can be used to assess anxiety in kindergarten and first-grade children if individually administered. Thus, the findings of this study extend the effective range of applicability of the STAIC from kindergarten to the sixth-grade level.

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