DOCUMENT RESUME

ED 190 610 TM 800 402

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TITLE Construct Validation of an Inventory of Affective Aspects of Schooling.

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SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE Apr 80
CONTRACT SED-78-17367
NOTE 43p.: Paper presented at the joint Annual Meetings of the American Educational Research Association and the National Council on Measurement in Education (Boston, MA, April 7-11, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Affective Measures: Classroom Environment: *Factor Structure: Intermediate Grades: *Student Attitudes: Student Characteristics: Teacher Characteristics: Test Reliability: Test Theory: *Test Validity
IDENTIFIERS *Inventory of Affective Aspects of Schooling: My Class Inventory (Anderson)

ABSTRACT

A theory was conceived to explain student, teacher, and classroom environment characteristics or constructs, which may influence student attitudes toward school and various subjects. A questionnaire representing the constructs, the Inventory of Affective Aspects of Schooling (IAAS), was developed and administered to 601 students in grade 4; Factor analyses and internal consistency reliability studies were then conducted to investigate construct validity. The inventory measured demographic characteristics, parent involvement, attitudes toward English, mathematics, social science, science, and toward teachers and school in general. Anderson's My Class Inventory was modified and included with the IAAS. The following variables had high factor loadings: parent involvement: attitudes toward school and specific subjects; self assurance in ability to learn: teacher quality: appreciation of classmates; and lack of academic motivation. Internal consistency ranged considerably from .29 to .91. Overall, the 34 variables subjected to reliability and factor analysis are promising, but vary considerably as predictors of the affective domain. The modified My Class Inventory should be used cautiously. (CP)

Construct Validation of an Inventory of Affective Aspects of Schooling[1]

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[1] This research was supported by the National Science Foundation SED78-17367. Any opinions expressed herein are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Abstract

A theoretical model was conceived to explain constructs which may account for student attitudes toward school and various subject matters. Measures representing these constructs were given to a total sample of over 5,000 fourth, seventh, and ninth grade students in an effort to provide confirming evidence that these measures provide construct-valid interpretations relevant to the model. Results of a series of analyses revealed a number of scales sufficiently internally consistent and factorially independent to be useful in research as well as to be potentially useful in school evaluations.

Construct Validation of an Inventory of Affective Aspects of Schooling

The purpose of this paper is to report progress of our effort to construct-validate the Inventory of Affective Aspects of Schooling (IAAS), an instrument designed to measure affective traits of students from grades four through twelve.

In the past decade, there has been increased interest in the study of attitudes among other affective aspects of schooling. The initial motivation for these studies has been that attitudes are believed to be important correlates, and perhaps determinants, of achievement (Mager, 1973). However, research has been inconclusive on this point (e.g., Wilson & Begle, 1972; Aiken, 1970, 1976). More recently, there has been a growing recognition that affective aspects of schooling, particularly attitudes toward school and subject matters, are important outcomes of schooling, independent of achievement. States like Oregon and Pennsylvania (Oregon Department of Education, 1974; Sieverling, 1978) have legislatively acted to include affective outcomes into statewide goals in education. Further, instructional program evaluations often include components devoted to affective concerns. Thus, affective outcomes of school programs are becoming increasingly important.

A major deficiency in research and program evaluation is the lack of suitable instrumentation for affective aspects of schooling for students below grade seven. In a review of instruments that measured attitudes toward school and subject matters, Haladyna and Thomas (1979a) reported that few validated instruments existed at the elementary school grades, and most consisted of scales which tapped only a single subject. None that were reviewed measured more than a single subject matter area. On the positive

side, some excellent attitude scales have been developed for middle school grades and for the secondary school. For example, the Fennema-Sherman scales (Fennema & Sherman, 1976) are especially well developed and validated, but these scales focus only on mathematics attitudes.

In other areas of the affective domain, Haladyna, Shaughnessy and Olsen (1980a) surveyed a wide range of affective instruments including some standardized, published ones. Several of these included the Quality of School Life (Epstein & McPartland, 1976), the Learning Environment Inventory (Anderson & Walberg) and the Classroom Environment Scales (Trickett & Moos, 1973). Despite the high quality of these scales and others, few were useful for detecting affective traits below grade seven. Most of the affective instruments reviewed did not include sections asking students to report their feelings about specific curriculum areas, and so data collected using the majority of these available instruments do not provide comprehensive information about attitudes.

There does exist, however, a large number of unpublished and unvalidated instruments which tap various aspects of the affective domain. These instruments and studies of these instruments reveal that they (a) provide information about only a few areas within the affective domain, (b) have little or no theoretical base upon which to develop construct valid test interpretations, (c) possess little reliability and validity information, and (d) are difficult to locate or are generally not accessible through normal channels. These factors mitigate the use of these instruments in meaningful research on the affective domain as well as in program evaluation.

The IAAS was developed to comprehensively tap three theoretically relevant areas within the affective domain that were hypothesized to be causally related to attitudes toward school and subject matters. These areas are

(a) teacher, (b) student, and (c) environment. To provide a background for these validation studies, a model for the study of affective aspects of school is outlined and the procedures one employs in construct validation are explained.

A Model for Affective Aspects of Schooling

Within the past decade, a number of important studies have contributed to our growing knowledge of aspects of the affective domain. These include the important work of Walberg (1974, 1976) on the learning environment, Moos and colleagues on the classroom environment (Trickett & Moos, 1973; Moos, 1978; Moos & Moos, 1978), Kohr and others from the Pennsylvania Department of Education (Kohr, 1977) on the educational quality of schools. This work contributed a growing base of understanding of what presently comprises the affective domain and its role in schooling. Interestingly, there has not been any extensive work at theoretically conceptualizing the entity known as the "affective domain" as it pertains to schooling. There are many standardized, personalogical measures available which have been used for research on personality factors, mental health and the like, but surprisingly little uniform development and research on affective domains in the school environment. Not even the Affective Taxonomy of Educational Objectives (Krathwohl, Bloom, & Masia, 1964) provides very specific descriptions of the affective domain, and there has not been any research reviewed or reported that attests to the categories of affective behavior found in that taxonomy.

The development of the present model was guided in part by an analysis of existing literature, with an emphasis on affective aspects of schooling which may explain attitudes toward school and subject matters. These

reviews are reported elsewhere (Haladyna, Shaughnessy, & Olsen, 1980a, 1980b; Shaughnessy & Haladyna, 1979; Shaughnessy, Olsen, Haladyna, & Shaughnessy, 1980), and specifically focus on the subject matters of mathematics, science, and social studies.

The intent was to theoretically describe the major areas of the affective domain, as they pertained to schooling, and then map the aspects of each area that seemed prominent in earlier studies. Three major areas were identified: (a) teacher, (b) student, and (c) the environment for learning. All affective aspects considered were easily classifiable with respect to these three major categories.

Within each of these three major areas (teacher, student, and environment), specific variables were considered as providing correlates of student attitudes toward school and various subject matters. The logic of this development follows the suggestions of Walberg (1969). Briefly, three stages of scientific inquiry are desirable. At the first stage, we identify a trait and attempt to measure it. At the second stage, we attempt to obtain descriptions of that trait and relate it to other traits of importance. At the third stage, we are concerned with positively modifying that trait through interventions, such as instructional programs, innovations, and the like. For example, student achievement has gone through all three stages of inquiry.

The development of the variables for each of these was done with the goal of attempting to completely map those variables which may account for differences or variations in attitudes toward school and subject matters.

The thrust of this conceptualization of the affective domain and the accompanying instrumentation was to develop both a theoretical means for the study of attitudes toward school and subject matters and practical instrumentation for measuring these affective aspects. The IAAS is the product of this effort. Each of the three areas is more completely described.

Teacher. As shown in Table 1, six major categories are included in this area: demographics, school achievement, professional commitment, attitudes, and teaching characteristics. While the mapping to each category is not complete, preliminary analysis has shown much promise for teaching characteristics as important determinants of student attitudes (Gardner, 1974, 1975; Haladyna, Shaughnessy, & Olsen, 1979).

Student. Table 1 shows eight categories of student variables: demographics, achievement, educational attitudes, academic self-concept, motivation, parental/familial influences, cultural/environmental influences, and adjustment. For the most part these variables are affective in themselves or are hypothesized to promote affective responses, but at least one is clearly cognitive (e.g., achievement). All of these variables were identified in one of two ways. First, a number were found to be associated with attitudes in previous research. Second, the balance were believed to be logically related to school attitudes. The resultant Table 1 represents those variables and the IAAS contains a representative sample of these variables.

Environment. Variables in this category center around the school, classroom, class activities, and program types. Much research has been done regarding the effectiveness of various innovative programs. Typically, a program will be compared to regular instruction in terms of attitudes and achievement. While there have been many studies dealing with the relationships of learning environment to achievement, in few studies has the relationship been examined between the learning environment and school attitudes.

Construct Validity

Construct validity was developed as an alternate to conventional forms of test validation, namely, content and empirical (predictive or concurrent).

Table 1

Constructs, Factors and Variables of the Model

Teacher Variables

A. Demographics

1. Sex
2. Age
3. Teaching Experience
4. Ethnic Origin

B. School Achievement

1. Level of Scholastic Achievement
2. Motivation as a Learner
3. Academic Self-Concept
4. Intellectual

C. Professional Commitment

1. Preservice Education
2. Inservice Education
3. Professional Activities

D. Attitudes Toward

1. Students
2. Fellow Teachers
3. Teaching
4. Administrators-(School Level)
   (Distr. Level)
5. Schools
6. Subject Matter Taught

E Teaching Characteristics

1. Organization
2. Philosophy About Teaching

Student Variables

A. Demographics

1. Sex
2. Age
3. Ethnic Origin
4. Birth Order
5. Mobility
6. Economic Status

B. Achievement

1. Grades
2. Subject Achievement

C. Educational Attitudes

1. Teacher
2. School
3. Enjoyment
4. Usefulness
5. Course

D. Academic Self-Concept

1. Confidence in Subject Matter
2. Confidence in School Learning
3. Sense of Worth

E. Motivation

1. Anxiety
2. Need to Learn
3. Need to Be Reinforced

F. Parental/Familial Influences

G. Cultural/Environmental Influences

H. Adjustment

1. Peer Relationships
2. Social Relationships

Learning Environment Variables

A. School

1. Spirit
2. Discipline
3. Climate
4. Appearance
5. Attitudes

B. Classroom

1. Intimacy
2. Friction
3. Cliqueness
4. Satisfaction
5. Speed
6. Difficulty
7. Apathy
8. Favoritism
9. Formality
10. Direction
11. Democracy
12. Disorganization
13. Diversity
14. Environment

C. Class Activities

1. Teacher
2. Student
3. Joint Activities

D. Program Type

1. Individualized vs. Class
2. Special Instructional Program

Cronbach and Meehl (1955) stated that one studies the construct validity of interpretations rather than of tests, because it is the meaning of the interpretations that we give to measurements that is critical. In educational testing, the use of construct validity is rare, although the term is frequently used to denote a type of study where evidence on multiple measures is used to establish convergent and discriminant evidence (Campbell & Fiske, 1959).

Strictly speaking, construct validation involves three steps: theoretical formulation, explication, and validation. The first two steps are logical and the third is empirical. Messick (1975) defines construct validity in the following way:

> Construct validation is the process of marshaling evidence in the form of theoretically relevant empirical relations to support the inference that an observed response consistency has a particular meaning. (p. 955)

Thus, an inferential leap is achieved from logical formulation to empirical observation, which Messick maintains is a concern for all of science. In general, Messick's belief seems to be that educational measurements should be construct-referenced, because construct valid interpretations answer fundamental questions about the processes that govern all aspects of schooling and that construct validation has benefits from both theoretical and practical perspectives.

In formulation, constructs and relationships among these constructs are hypothesized. This formulation is strictly abstract, and the conceptual mapping is known as the "nomological network."

Olsen, Haladyna, and Shaughnessy (1979), in formulating the preliminary constructs, have expressed a functional relationship among these major categories of affective variables that fundamentally describes the correlates of

of attitudes toward school and the subject matters that comprise the school curriculum. The relationship is

$$Y = F[T, S, E]$$

where

Y is the criteria, attitudes toward school or any subject matter

T is a group of teacher variables

S is a group of student variables

E is a group of variables representing the school environment.

Preliminary analyses in social studies attitudes suggest that nearly 50% of the variation of attitude scores can be accounted for by less than six variables distributed across these three dimensions (Haladyna, Shaughnessy, & Olsen, 1979).

The second stage, explication, involves the identification of test scales which adequately and logically represent the scales constructs. For every construct, it is prudent to identify multiple measures, because in the validation stage such a state of affairs will lead to the collection of convergent evidence in support of the construct validation.

The third stage, construct validation, refers to any of four essential types of studies. These studies involve the administration of instruments to subjects from whom these responses are analyzed relevant to the questions of each study type. Positive evidence provides support for construct valid interpretations, while negative evidence suggests one of three possibilities: (a) that the original theorizing was faulty, (b) that the explication of measures was inadequate or inappropriate, or (c) that the methods by which the data were analyzed were improper.

The four types of studies involved in construct validation include: (a) correlational or factor analytic, (b) internal consistency, (c) group

differences, or (d) process or developmental. The present report focuses on the first two types of studies, and each is briefly discussed.

Correlational or factor analytic. This kind of study is used to establish the independence of various constructs through analysis of measures of these constructs. Correlations between measures of the same constructs should be uniformly high, while correlations between measures of different constructs should be uniformly low. When factor analysis is used, such results should yield independent factors which resemble our formulation.

Internal consistency. A common approach to estimating test reliability is internal consistency. When test items are highly interrelated, or test items are highly related to the total test score, the internal consistency estimate of reliability is high. With conventional rating scale items, alpha coefficients are used to estimate internal consistency. It is expected that internal consistency estimates of reliability should be reasonably high ($\alpha > .70$) for these scales.

A very effective construct validation effort was performed by Shavelson, Hubner, and Stanton (1976) in their review of research on self-concept in schooling. The present series of construct validity studies hopes to continue in their tradition.

The present report is intended to provide evidence relevant to the first two types of studies, (a) correlational and factor analytic and (b) internal consistency. Future studies are in progress that will report on group differences and developmental processes. These other forms of evidence, taken with evidence presented in this study, form the total for which we purport that the IAAS yields construct valid test interpretations of affective aspects of schooling.

Method

Subjects

The IAAS was administered to 601 students in fourth grade classrooms. A related questionnaire was administered to each teacher. These students varied widely with respect to level of achievement, socio-economic status and other demographic variables, as shown in Table 2.

A sampling plan was employed to control for the size of school and school district. Elementary school districts were classified as (a) over 4,000 students or (b) under 4,000 students; and school sizes varied three ways, (a) under 250, (b) 250-399, and (c) 400 and over. Thus, results were not biased with respect to school size or the size of the district. In grade 7, school sizes were (a) greater than 450 and (b) 450 and fewer; while in grade 9, school sizes were (a) over 1,000 and (b) 1,000 and fewer. In addition, school classrooms were drawn equally from three distinct geographic regions in the State of Oregon: Metropolitan Portland and suburbs, the semi-rural mid-Willamette Valley, and the mainly rural Southern Oregon area.

Instrumentation

A form of the IAAS designated for grades 4-6 was administered to all fourth grade students in the sample. The IAAS was developed through a process of review that examined known instruments with known and desirable characteristics. Instruments with useful scales were adapted or modified to fit the constraints of the IAAS. Among these constraints were: (a) the instrument would be a self-report type, (b) the total administration time would be less than 30 minutes, and (c) the largest number of variables shown in Table 1 could be reliably obtained from the administration of the instrument.

Table 2

Descriptive Statistics of the Sample
N=601

1. Sex: Boys - 49%
Girls - 51%

2. Ethnic Origin:

American Indian	6.0%
Oriental	2.0%
Black	0.5%
White	36.0%
Mexican-American	3.0%
Mixed	2.0%

3. Socio-Economic Status:

Mean	8.8
Range of Scale	0-12

4. TV Viewing Habits:

None	2.0%
Less than an hour	9.0%
1-2 hours	13.0%
2-3 hours	17.0%
More than 3 hours	59.0%

5. Mobility:

Never moved	36%
Moved once	21%
Moved two times	16%
Moved three times	12%
Moved four times	6%
Moved more than four times	10%

6. Attendance:

0-3 days missed	53%
About one week	21%
About two weeks	11%
More than two weeks	15%

The first part of the inventory produced a page of demographic information dealing with sex, ethnicity, mobility in schools, socio-economic status, television viewing habits, and school attendance (as shown in Table 2). A second section dealt with parental involvement in aspects of schooling as well as parental trust, support, and relationships. A third section included an attitude instrument that has yielded dependable measures of attitudes toward school and four subject matters (Haladyna & Thomas, 1979b). A fourth section yielded five scales from the My Class Inventory, originally devised by Anderson and Walberg. This instrument was intended to tap aspects of the learning environment much like the Learning Environment Inventory does for students in grade seven and above. Modifications were made to obtain scales for student enjoyment, friction, competition, difficulty, peer relationships and satisfaction. A fifth section deals with perceptions of the school in general and perceptions of self as a student. The sixth section is generic in nature and can be specifically applied to any subject matter. For instance in this study, 30 classrooms were administered these items for social studies. For example, some questions include:

My teacher likes _____.

I can get good grades in _____.

The seventh and last section deals with characteristics of the teacher, as shown earlier in Table 1. The entire instrument appears in Appendix A.

Procedures

Participating classrooms for the study were obtained on a volunteer basis through discussions with school principals. The only selection criteria was that teachers would be willing to assist with the study. Efforts were made to obtain an equal number of male and female teachers for

the sample and to ensure that these teachers varied greatly with respect to age, experience, and amount of training for teaching.

For all classrooms, a field-test administrator administered the inventory to the students. All questions were read to the students, and no names were placed on the response sheets. Teachers were excused from the room so they could complete the teacher inventory.

Analysis of Data

A principal components factor analysis was performed with a quartimax rotation. The quartimax procedure is useful when the number of factors is believed to be equally represented in the data. The purpose of the factor analysis was to confirm the hypotheses that these variables existed and were empirically independent.

Correlations among items were computed. Internal consistency reliability was assessed using coefficient alpha, which was estimated using a procedure suggested by Guilford (1965) and Nunnally (1967) and which is based on the use of the mean of inter-item correlations among selected items and the Spearman-Brown formula.

Results and Discussion

One of the most useful methods for establishing evidence for the construct validity of interpretations of test scales is through the multi-trait, multi-method matrix. These procedures, first suggested by Campbell & Fiske (1955), are useful for developing convergent and discriminant evidence. If these relationships among items of a scale are relatively high, convergent evidence is extant. If the relationships among variables is consistently lower than relationships of items that comprise that variable, then discriminant evidence is suggested.

Internal consistency is one way to estimate the degree of convergent evidence that a set of items possesses. Both convergent and discriminant evidence is established through factor analysis or correlation. The evidence is reviewed for each major section of the IAAS.

Biographical Information

Most of these are single-item variables and, therefore, not subject to standard reliability analysis or factor analysis. Sex of student, ethnicity, family mobility, socio-economic status, television viewing habits and absenteeism were all found to be important in earlier research, and therefore not subject to further scrutiny.

Parental/Familial Influences

One of the student characteristics identified in Table 1 was parental/familial influences. Earlier work had suggested that the variables represented by these items included (a) parental involvement, (b) parental concern about schoolwork, and (c) parental perceptions of the importance of school.

The results of the reliability analysis and the factor analysis are presented in Table 3. As shown there, the alpha coefficients were quite low, ranging from .29 (for a two-item variable) to .59. Thus the convergent evidence for these three variables was quite weak.

The factor analysis of these items revealed reasonably high factor loadings for each variable with no overlap on items which were not hypothesized to belong to these variables. Thus, the convergent and discriminant evidence, as judged by the factor analysis, was somewhat atronger. The consequences of using variables such as these in descriptive studies is that a ceiling is put on the magnitudes of correlations due to the unreliability

Table 3

Convergent and Discriminant Evidence for Test Scales Relating to Parents and Family

Test Scale	Number of Items	Internal Consistency Reliability Estimate	Factor Loadings of Items of Scale Mean	Factor Loadings of Items of Scale Range	Factor Loadings of Other Items Mean	Factor Loadings of Other Items Range
Parent Involvement	6	.59	.46	.30-.52	.12	.00-.24
Parental Concern About School Work	6	.52	.36	.29-.46	.08	.00-.22
Parental Perceptions of the Importance of School	2	.29	.64	.56-.71	.07	.01-.15

of measurements. Since these three variables had low reliability estimates, correction for attenuation could be used to determine what relationships are when measurements are error free.

Attitudes Toward School and Subject Matters

Five attitudes variables existed in this part of the IAAS. These instruments were adapted from an earlier version (Haladyna & Thomas, 1979b). The variables were attitudes toward school, English (language arts), mathematics, social studies, and science.

As shown in Table 4, internal consistency reliability was satisfactorily high for the subject matters, but somewhat lower for the school attitude scale. These results appear similar to those reported by Haladyna and Thomas (1979b) in their study of these instruments with the major exception that the present scales are based on four items instead of five, as found in the earlier version.

Table 4

Convergent and Discriminant Evidence for the Attitude Scales

Test Scale	Number of Items	Internal Consistency Reliability Estimate	Factor Loadings of Items of Scale Mean	Range	Factor Loadings of Other Items Mean	Range
1 School	4	.74	--	--	--	
2. English	4	.87	.71	.62-.80	.16	.01-.38
3. Mathematics	4	.87	.73	.64-.80	.19	.06-.40
4. Social Studies	4	.89	.75	.71-.81	.10	.03-.18
5. Science	4	.90	.74	.69-.79	.12	.05-.22

The factor analysis of these items revealed clear factor structures for the four subject matter scales. The school attitude factor failed to factor and, instead, split between the mathematics and English factors. This result would suggest that students at this level are likely to not discriminate between their attitudes toward school and attitudes toward the two subject matters that dominate the fourth grade curriculum. In an earlier study of this instrument, Haladyna and Thomas (1979b) used data from grade levels four, five, and six, which may have resulted in a more satisfactory factor analysis. Nonetheless, the convergent and discriminant evidence for these attitude scales is relatively good.

Learning Environment

The Learning Environment Inventory or LEI (Anderson & Walberg), an instrument that yields scores on 14 measures of the classroom learning environment, has proven reliability and validity. A version of the LEI which is more suitable for intermediate grade students is the My Class

Inventory. This instrument has not been widely used and there is not a rich history of its use or validation. The My Class Inventory was slightly revised and administered as part of the IAAS. The scales were satisfaction, friction, difficulty, cohesiveness, and competition. Results of all analyses appear in Table 5.

Internal consistency reliability for the five scales ranged from .46 to .70. Despite the fact that each scale contained seven items, these estimates were not as high as expected, and therefore, the convergent evidence was not strong. An examination of the pattern of correlations among items within each scale revealed that several items could be removed and the internal consistency reliability improved. Consequently, reliability was increased by actually decreasing test length. Table 5 provides this information as well as the results of the factor analysis.

Table 5

Convergent and Discriminant Evidence for the Learning Environment Variables of the IAAS

Test Scale	Number of Items	Internal Consistency Reliability Estimate	Factor Loadings of Items of Scale Mean	Factor Loadings of Items of Scale Range	Factor Loadings of Other Items Mean	Factor Loadings of Other Items Range
1. Satisfaction	7	.70	.46	.26-.59	.21	.01-.51
2. Friction	7	.58	.38	.19-.52	.12	.01-.47
3. Difficulty	7	.46	.27	.05-.62	.02	.01-.16
4. Cohesiveness	7	.59	.25	.06-.52	.06	.01-.26
5. Competition[1]	7	.47	-----		-----	

[1] No satisfactory loadings were reported for this factor.

Factor analysis yielded slightly stronger evidence for the convergent validity. The mean factor loadings of the seven items of each scale was consistently higher than the mean factor loadings of items not hypothesized to reflect each scale. However, there were items which were not thought to be reflective of scales which received high factor loadings. For this reason, discriminant evidence of these scales is thought to be somewhat lacking. Thus the five scales of the My Class Inventory as presented in the IAAS should be used cautiously. These scales would profit from further development and validation studies before they can be used confidently in research and school evaluations.

Other Student Characteristics of the IAAS

The most substantial portion of the IAAS was devoted to 82 items detailing at least 15 variables. These ranged from single item variables calling for the amount of homework assigned on a subject matter to a global teacher quality scale consisting of 19 items. The results of the reliability analyses and the factor analysis are presented in Table 6. As shown there, only 5 of the 15 variables factored cleanly and therefore display both convergent and discriminant evidence. These factors are (a) attitude toward school--12 items, (b) self assurance in ability to learn--8 items, (c) teacher quality--19 items, (d) appreciation of classmates--3 items, and (e) lack of motivation for school--5 items.

Internal consistency reliability estimates ranged from .61 to .91, and factor structures provided fairly clear resolution. With the large teacher quality scale, there were some items which were not hypothesized to reflect that trait but had reasonably high loadings. The other factors had little or no overlap of this type.

Table 6

Convergent and Discriminant Evidence for Student Characteristics of the IAAS

Test Scale	Number of Items	Item Identification	Internal Consistency Reliability Estimate	Factor Loadings of Items of Scale		Factor Loadings of Other Items	
				Mean	Range	Mean	Range
1. Attitudes Toward School	12	P601, P602, P604, P606, P607, P608, P609, P610, P611, P612, P613, P641	.79	.37	.30-.47	.07	.00-.24
2. Self Assurance in Ability	8	P621, P625, P626, P628, P629, P630, P704, P717	.73	.36	.27-.53	.09	.01-.30
3. Teacher Quality	19	P644, P719, P801, P802, P804, P806, P807, P808, P809, P810, P811, P812, P813, P814, P815, P816, P821, P825, P826	.91	.58	.33-.69	.31	.02-.49
4. Enjoyment of Classmates	3	P624, P642, P643	.61	.41	.31-.50	.06	.00-.29
5. Lack of Motivation	5	P708, P710, P714, P716, P818	.61	.36	.25-.49		-----
6. Teacher Enthusiasm for Subject	2	P701, P706	.44		-----		-----
7. Teacher Admiration & Respect	3	P644, P707, P709	.44		-----		-----
8. Importance of Subject Matter	1	P713	-----		-----		-----
9. Self Report Grades	1	P720	-----		-----		-----
10. Teacher Support for Individual	4	P803, P819, P820, P821	.60		-----		-----
11. Teacher Praise & Reinforcement	5	P802, P805, P807, P808, P814	.70		-----		-----
12. Teacher Commitment to Help Student Learn	4	P806, P809, P812, P815	.73		-----		-----

Table 6, Continued

	Test Scale	Number of Items	Item Identification	Internal Consistency Reliability Estimate	Factor Loadings of Items of Scale		Factor Loadings of Other Items	
					Mean	Range	Mean	Range
13.	Fairness	3	P804, P810, P816	.65	-----		-----	
14.	Amount of Homework Done	1	P723	-----	-----		-----	
15.	Amount of Homework Assigned	1	P724	-----	-----		-----	

25

Considering the ten variables not detected in the factor analysis, internal consistency reliability estimates were possible for only six of these, and these estimates ranged from .44 to .73. All of these test scales were short, ranging from two to five items. These five variables appear to possess moderate to low convergent evidence and no discriminant evidence. In fact, many of these scales can be viewed as aspects of overall teacher quality. Therefore, the use of these scales in research and evaluation studies should be done carefully, as there is a tendency for all of these scales to be highly interrelated.

The remaining four single-item scales have face validity and also have relatively low correlations with other variables in this set. Consequently, these single-item variables may be useful despite the limitation that exists with single-item variables, namely, low reliability.

Summary

As a means for summarizing this validation study, the scales and their respective items are presented in Table 7. Considering the biographical items from page one of the IAAS, there are a total of 34 variables listed. Each of these variables has a place on the framework shown in Table 1, and each variable has been subjected to some form of validation study.

The internal consistency of these variables ranges considerably from .29 to .91. While many of these variables lack the degree of internal consistency desired, it should be noted that the IAAS is limited in length by the time desired for administration, less than 30 minutes. Any of these scale's reliability could be increased by adding acceptable items. A compromise is achieved by including more scales and having fewer items on each scale. Thus, comprehensiveness is gained at the sacrifice of precision.

Table 7

Variables of the Inventory of Affective Aspects of Schooling

1.	Sex	101
2.	Family Background	102
3.	Family Mobility	103
4.	Socio-economic Status	104
5.	Television Viewing	105
6.	School Attendance	106
7.	Parental Involvement	207, 208, 209, 210, 212, 214
8.	Parental Concern	203, 204, 210, 211, 215, 723
9.	Parental Perception of the Importance of Schools	205, 206
10.	Attitude Toward School	301, 302, 303, 304
11.	Attitude Toward English	305, 306, 307, 308
12.	Attitude Toward Mathematics	309, 310, 311, 312
13.	Attitude Toward Social Studies	313, 314, 315, 316
14.	Attitude Toward Science	317, 318, 319, 320
15.	Satisfaction with Class	401, 407, 411,[1] 415, 419, 525, 535
16.	Friction in Class	402,[1] 406, 416, 420, 526, 529,[1] 533
17.	Difficulty	404, 410,[1] 413,[1] 421, 524,[1] 528, 532
18.	Coh iveness (Friendships)	405, 409,[1] 414, 418, 523, 527, 530[1]
19.	Competition	403,[1] 408, 412, 417, 422,[1] 531,[1] 534
20.	Attitudes Toward School	601, 602, 604, 606, 607, 608, 609, 610, 611, 612, 613, 641
21.	Self Assurance in School Ability	621, 625, 626, 628, 629, 630, 704, 717
22.	Overall Teacher Quality	644, 719, 801, 802, 804, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 821, 825, 826

[1] It was found that internal consistency is improved by deleting this item.

Table 7, Continued

23.	Enjoyment of Classmates	624, 642, 643
24.	Level of Concern	708, 710, 714, 716, 818
25.	Concern for Grades	645
26.	Teacher Enthusiasm for Subject	701, 706
27.	Respect for Teachers	644, 707, 709
28.	Importance of Subject	713
29.	Amount of Homework Done	723
30.	Amount of Homework Assigned	724
31.	Teacher Support for the Individual	803, 819, 820, 821
32.	Teacher Praise and Reinforcement	802, 805, 807, 808, 814
33.	Teacher Commitment to Student Learning	806, 809, 812, 815
34.	Fairness to Students	804, 810, 816

As mentioned earlier, in descriptive research, this loss of precision can be offset by correction for attenuation. Thus, relationships can be estimated as if measurements were error free.

Factor analysis was used to establish both convergent and discriminant evidence for some of these scales. The results of these analyses revealed that certain variables, such as attitudes, were clearly resolved, while others produced mixed results. Overall, these 34 variables appear to offer promise in mapping parts of the affective domain, but they vary considerably in their dependability. Researchers and school evaluators may want to select variables and respective items of each scale prudently to maximize precision of measurement without losing any comprehensiveness desired. The IAAS was designed to be used in a series of studies on affective correlates of school attitudes. In other applications, the IAAS should be modified to overcome some of the apparent lack of precision and poor factor structures that were evident in the present study.

References

Aiken, L. R., Jr. Attitudes toward mathematics. Review of Educational Research, 1970, 40, 551-596.

Aiken, L. R., Jr. Update on attitudes and other affective variables in learning mathematics. Review of Educational Research, 1976, 46(2), 293-311.

Anderson, G. J., & Walberg, H. J. The assessment of learning environments: A manual for the Learning Environment Inventory and the My Class Inventory. Chicago, Illinois: Office of Evaluation Research, University of Illinois at Chicago Circle, undated.

Campbell, D. T., & Fiske, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.

Cronbach, L. J., & Meehl, P. E. Construct validity in psychological tests. Psychological Bulletin, 1955, 52, 281-302.

Epstein, J. L., & McPartland, J. M. The concept and measurement of the quality of school life. American Educational Research Journal, 1976, 13, 15-30.

Fennema, E., & Sherman, J. A. Fennema-Sherman mathematics attitudes scales: Instruments designed to measure attitudes toward the learning of mathematics by females and males. Abstracted in the JSAS Catalog of Selected Documents in Psychology, 1976, 6(2), 31.

Gardner, P. L. Research on teacher effects: Critique of a traditional paradigm. British Journal of Educational Psychology, 1974, 44(2), 123-130.

Gardner, P. L. Attitudes to science. A review. Studies in Science Education, 1975, 2, 1-41.

Guilford, J. P. Fundamental statistics in psychology and education. New York: McGraw-Hill, 1965.

Haladyna, T., Shaughnessy, J., & Olsen, R. Correlates of attitudes toward social studies. Paper presented at the annual meeting of the National Council for the Social Studies, Portland, Oregon, November 1979.

Haladyna, T., Shaughnessy, J., & Olsen, R. Affective aspects of schooling: A sourcebook of instruments. Book in preparation, 1980. (a)

Haladyna, T., Shaughnessy, J., & Olsen, R. A quantitative synthesis of research on student attitudes toward science as a school subject. Unpublished Manuscript, 1980. (b) (Available from T. Haladyna, Teaching Research, Monmouth, Oregon, 97361.)

Haladyna, T., & Thomas, G. The affective reporting system. Journal of Educational Measurement, 1979, 16(1), 49-54. (a)

Haladyna, T., & Thomas, G. The attitudes of elementary school children toward school and subject matters. The Journal of Experimental Education, 1979, 48(1), 18-23. (b)

Kohr, R. L. A survey of teacher attitudes and classroom practices. Paper presented at the annual meeting of the American Educational Research Association, New York, April 1977.

Krathwohl, D. R., Bloom, B. S., & Masia, B. A taxonomy of educational objectives, Handbook II: The affective domain. New York, David McKay Company, 1964.

Mager, R. F. Measuring instructional intent or Got a match? Belmont, CA: Lear Siegler, Inc./Fearon Publishers, 1973.

Messick, S. The standard problem: The meaning and values in measurement and evaluation. American Psychologist, 1975, 30, 955-966.

Moos, R. H. A typology of junior high and high school classrooms. American Educationai Research Journal, 1978, 15(1), 53-66.

Moos, R. H., & Moos, B. S. Classroom social climate and student absences and grades. Journal of Educational Psychology, 1978, 70(2), 263-269.

Nunnally, J. Psychometric theory. New York: McGraw-Hill, 1967.

Olsen, R., Haladyna, T., & Shaughnessy, J. A model for affective aspects of schooling. Paper presented at the annual meeting of the National Council for the Social Studies, Portland, Oregon, November 1979.

Oregon Department of Education. Minimum standards for Oregon Public Schools. Salem, Oregon: Oregon Department of Education, 1974.

Selverling, R. F. (Ed.). Manual for interpreting elementary school reports. Harrisburg: Pennsylvania Department of Education, 1978.

Shaughnessy, J., & Haladyna, T. Research on student attitudes toward social studies. Paper presented at the annual meeting of the National Council Social Studies, Portland, Oregon, November 1979.

Shaughnessy, J., Olsen, R., Haladyna, T., & Shaughnessy, J. M. Student attitudes toward math: A meta analysis. Paper to be presented at the International Council on Math Education, Berkeley, California, August 1980.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. Self-concept: Validations of construct interpretations. Review of Educational Research, 1976, 46(3), 407-441.

Trickett, E. J., & Moos, R. H. Social environment of junior high and high school classrooms. Journal of Educational Psychology, 1973, 65(1), 93-102.

Walberg, H. J. The social environment as a mediator of classroom learning. Journal of Educational Psychology, 1969, 60(6), 443-448.

Walberg, H. J. Learning models and learning environments. Educational Psychologist, 1974, 11, 102-109.

Walberg, H. J. The psychology of learning environments: Behavioral, structural, or perceptual? In Lee S. Schulman (Ed.), Review of research in education. Itasca, IL: F. E. Peacock, and sponsored by American Educational Research Association, 1976.

Wilson, J. W., & Begle, E. G. (Eds.). Correlates of mathematics achievement: Attitude and role variables. NLSMA Report No. 21, Part A. Stanford, CA: Board of Trustees of the Leland Stanford Junior University, 1972.

Appendix A

IAAS Questionnaire

BIOGRAPHICAL INFORMATION

Please answer all questions. Check the correct box.

1. 1 ☐ boy 2 ☐ girl

2. Family Background

1 ☐ American Indian
2 ☐ Oriental
3 ☐ Black
4 ☐ White (Caucasian)
5 ☐ Mexican American

3. How many times have you moved since you started first grade?

1 ☐ never moved
2 ☐ one
3 ☐ two
4 ☐ three
5 ☐ four
6 ☐ more than four

4. Which of the following does your family have at home?

1 ☐ newspaper delivered every day
2 ☐ magazines delivered regularly
3 ☐ more than 25 books
4 ☐ encyclopedia
5 ☐ dictionary
6 ☐ record player
7 ☐ tape recorder or cassette player
8 ☐ typewriter
9 ☐ vacuum cleaner
10 ☐ automatic dishwasher
11 ☐ two or more cars or trucks that run
12 ☐ two or more TV sets

5. On the average about how much TV do you watch each day?

1 ☐ none
2 ☐ about one hour or less
3 ☐ about one to two hours
4 ☐ two to three hours
5 ☐ more than three hours

6. The total number of school days I missed last year was about...

1 ☐ 0 - 3 days
2 ☐ about 1 week
3 ☐ about 2 weeks
4 ☐ more than 2 weeks

	Yes ☐ 1	? ☐ 2	No ☐ 3
1. Do you check books out from the public library?	☐	☐	☐
2. Do you check books out from the school library?	☐	☐	☐
3. Do your parents remind you to do your school work?	☐	☐	☐
4. Do your parents talk to you about your school work?	☐	☐	☐
5. Do your parents think that school is important?	☐	☐	☐
6. Do your parents care about how well you do in school?	☐	☐	☐
7. Do you tell your parents about the things you do well?	☐	☐	☐

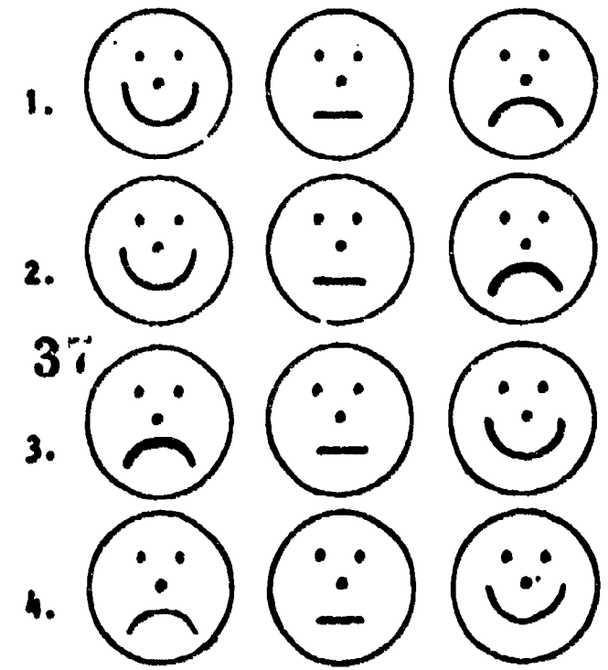
Do your parents:	Often	Sometimes	Hardly Ever
8. take you interesting places?	☐	☐	☐
9. talk to you about the news?	☐	☐	☐
10. spend a lot of time talking with you?	☐	☐	☐
11. offer to help you with schoolwork?	☐	☐	☐
12. trust you to do things?	☐	☐	☐
13. argue with you a lot about rules?	☐	☐	☐
14. let you make decisions?	☐	☐	☐
15. encourage you to read?	☐	☐	☐

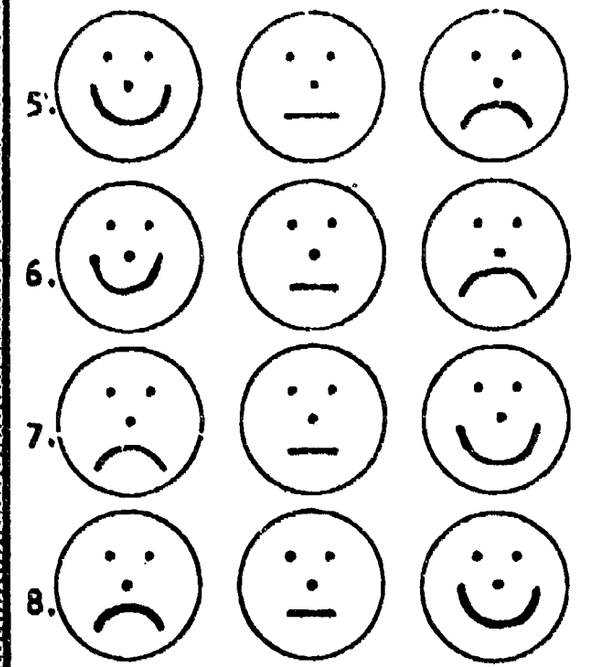
TREAT

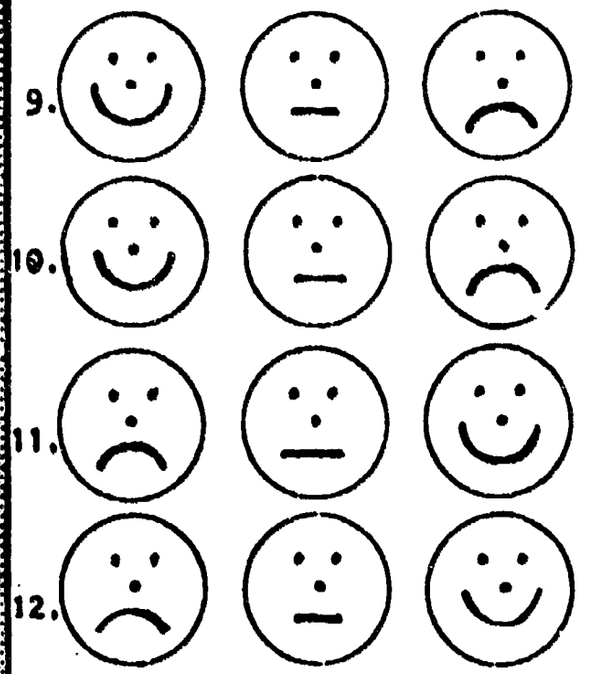
PRACTICE SAMPLES

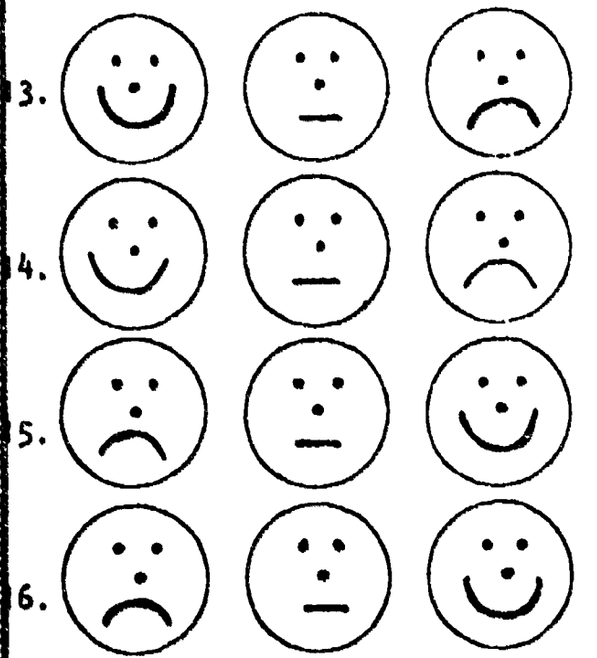
A 

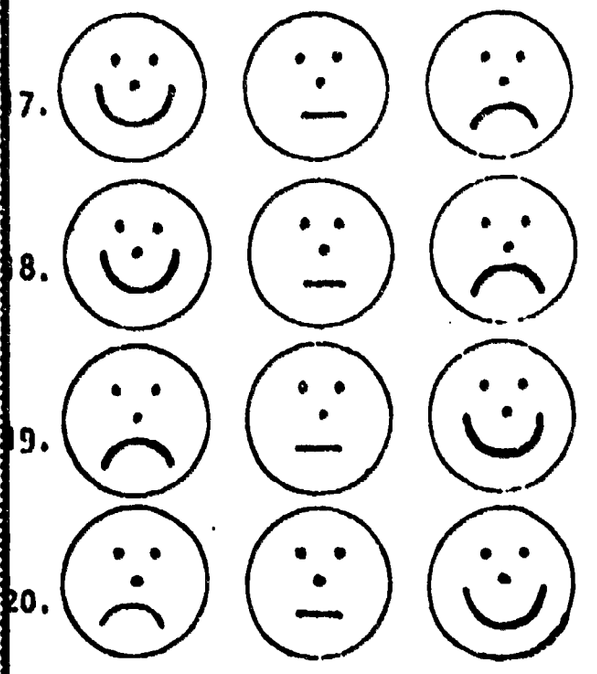
B 











Check Your Answer Here

My Class

		Agree 1	Maybe 2	Disagree 3
1.	The students in my class enjoy their schoolwork.	☐	☐	☐
2.	Children are always fighting with each other.	☐	☐	☐
3.	The same people always do the best work in our class.	☐	☐	☐
4.	In our class the work is hard to do.	☐	☐	☐
5.	My best friends are in my class.	☐	☐	☐
6.	Some of the children in our class are mean.	☐	☐	☐
7.	Most kids are pleased with the class.	☐	☐	☐
8.	Children often race to see who can finish first.	☐	☐	☐
9.	Many children in our class play together after school.	☐	☐	☐
10.	Most children can do their schoolwork without help.	☐	☐	☐
11.	Some kids don't like the class.	☐	☐	☐
12.	Most children want their work to be better than their friends' work.	☐	☐	☐
13.	Only the smart kids can do the work in our class.	☐	☐	☐
14.	In my class almost everybody is my friend.	☐	☐	☐
15.	Most of the kids in my class enjoy school.	☐	☐	☐
16.	In my class some kids don't like other kids.	☐	☐	☐
17.	Some kids feel bad when they do not do as well as the others.	☐	☐	☐
18.	I like to work with others in my class.	☐	☐	☐
19.	Most children say the class is fun.	☐	☐	☐
20.	Some people in my class are not my friends.	☐	☐	☐
21.	Kids often find their work hard.	☐	☐	☐
22.	Most children don't care who finishes first.	☐	☐	☐

		Check Your Answer Here		
		Agree 1	Maybe 2	Disagree 3
23.	Most of the children know each other well.	☐	☐	☐
24.	Only the smart kids can do their work	☐	☐	☐
25.	Children seem to like the class.	☐	☐	☐
26.	Certain students always want to have their own way.	☐	☐	☐
27.	Most students in my class are close friends.	☐	☐	☐
28.	Many students in our class say that school is easy.	☐	☐	☐
29.	Children in our class fight a lot.	☐	☐	☐
30.	Most of the kids in my class like one another.	☐	☐	☐
31.	Some kids always do better than the rest of the class.	☐	☐	☐
32.	Schoolwork is hard to do.	☐	☐	☐
33.	Certain students don't like what other students do.	☐	☐	☐
34.	A few kids in my class want to be first all of the time.	☐	☐	☐
35.	This class is fun.	☐	☐	☐

About this School

		Yes 1	Maybe 2	No 3	
1.	Kids like this school.	☐	☐	☐	1.
2.	The classrooms in this school are too crowded.	☐	☐	☐	2.
3.	Students and teachers work together at our school.	☐	☐	☐	3.
4.	The school is a friendly place.	☐	☐	☐	4.
5.	I wish that my classes were smaller so that my teachers could spend more time with me.	☐	☐	☐	5.
6.	Our school is too small.	☐	☐	☐	6.
7.	My school has a lot of books and materials that I can use to help myself.	☐	☐	☐	7.
8.	This school is old and crummy.	☐	☐	☐	8.
9.	The teachers in my school seem to like what they are doing.	☐	☐	☐	9.
10.	The people who run my school probably like what they are doing.	☐	☐	☐	10.
11.	Students treat each other fairly at this school.	☐	☐	☐	11.
12.	The school treats students fairly.	☐	☐	☐	12.

13. How do you rate the school spirit at your school?

☐ a. very good ☐ b. good ☐ c. fair ☐ d. poor ☐ e. very poor

Your Feelings

		Yes 1	Maybe 2	No 3	
1.	Learning things in school is easy for me.	☐	☐	☐	1.
2.	There are a lot of things I don't understand, no matter how hard I study.	☐	☐	☐	2.
3.	I am rarely told when I do good work.	☐	☐	☐	3.
4.	My classmates like what I say.	☐	☐	☐	4.
5.	I believe I can do most things well.	☐	☐	☐	5.
6.	I like the work that I do.	☐	☐	☐	6.
7.	I am only punished when I deserve it.	☐	☐	☐	7.
8.	My classmates listen to my suggestions.	☐	☐	☐	8.
9.	I think that I am a successful student.	☐	☐	☐	9.
10.	When I work hard in school I do better in school.	☐	☐	☐	10.
11.	How well I do in school depends on my good luck.	☐	☐	☐	11.

		very much 1	Some 2	not much 3	
1.	How much do you like your school?	☐	☐	☐	1.
2.	How much do you like your class?	☐	☐	☐	2.
3.	How much do you like the students in your class?	☐	☐	☐	3.
4.	How much do you like your teacher?	☐	☐	☐	4.
5.	Is it important to you to get good grades?	☐	☐	☐	5.
6.	Do you prefer to sit in the back of the classroom?	☐	☐	☐	6.
7.	How much do you speak out in class?	☐	☐	☐	7.

About Social Studies	Yes 1	Maybe 2	No 3
1. My teacher likes social studies.	☐	☐	☐
2. Social Studies doesn't scare me at all.	☐	☐	☐
3. As long as I pass, my parents don't care how I do in social studies.	☐	☐	☐
4. I'm sure I can learn social studies.	☐	☐	☐
5. Social Studies in enjoyable to me.	☐	☐	☐
6. My teacher is excited about teaching us social studies.	☐	☐	☐
7. My teacher knows a lot about social studies.	☐	☐	☐
8. Social studies makes me feel uneasy and confused.	☐	☐	☐
9. I wish I could have the same social studies teacher next year.	☐	☐	☐
10. Social Studies has no usefulness in my life.	☐	☐	☐
11. My parents think I could be good in social studies.	☐	☐	☐
12. My parents want me to plan to take more social studies.	☐	☐	☐
13. Social studies is a worthwhile and necessary subject.	☐	☐	☐
14. I'm not the type to do well in social studies.	☐	☐	☐
15. Most time in social studies is spent doing other things than listening to the teacher.	☐	☐	☐
16. I do as little work as possible in social studies.	☐	☐	☐
17. I can get good grades in social studies.	☐	☐	☐
18. There is little chance for students to talk in social studies.	☐	☐	☐
19. Things go smoothly in our social studies class.	☐	☐	☐

20. What kinds of grades to you usually get in social studies?

☐ 1. mostly A's ☐ 2. mostly A's & B's ☐ 3. mostly B's ☐ 4. mostly B's & C's

☐ 5. mostly C's ☐ 6. lower than C ☐ 7. no grades are given

21. About how much of the time does your teacher talk during social studies?

☐ 1. almost all the time ☐ 2. most of the time ☐ 3. sometimes ☐ 4. hardly at all

22. Is there a place in your home for homework? ☐ 1. yes ☐ 2. no

23. About how much time do you spend on homework each week?

☐ a. none ☐ b. up to 30 min ☐ c. 31-60 min ☐ d. more than 60 min.

24. About how much homework is assigned each week in social studies?

☐ a. none ☐ b. up to 15 min ☐ c. 15-30 min ☐ d. more than 30 min.

During social studies, my teacher:	Yes 1	Maybe 2	No 3
1. is interested in me.	☐	☐	☐
2. tells me when I do good work.	☐	☐	☐
3. is often too busy to help me when I need help.	☐	☐	☐
4. is fair to me.	☐	☐	☐
5. encourages me to do new and unusual things.	☐	☐	☐
6. tries very hard to help me understand hard schoolwork.	☐	☐	☐
7. really cares about me.	☐	☐	☐
8. appreciates our work.	☐	☐	☐
9. is willing to help students learn.	☐	☐	☐
10. is fair when disciplining students.	☐	☐	☐
11. wants me to say what I think.	☐	☐	☐
12. explains things very well.	☐	☐	☐
13. has a friendly attitude.	☐	☐	☐
14. says nice things to me when I complete my work.	☐	☐	☐
15. gives me extra help when needed.	☐	☐	☐
16. is fair in testing and grading.	☐	☐	☐
17. would let the class plan an event.	☐	☐	☐
18. doesn't take enough time to explain things.	☐	☐	☐
19. makes things worse when I have a problem.	☐	☐	☐
20. scares me.	☐	☐	☐
21. listens to what I have to say.	☐	☐	☐
22. has said sometimes that s(he) doesn't know something.	☐	☐	☐
23. lets me work at my own speed.	☐	☐	☐
24. spends too much time asking students to be quiet or to sit down.	☐	☐	☐
25. asks good questions.	☐	☐	☐
26. has interesting demonstrations.	☐	☐	☐
27. uses movies or filmstrips.	☐	☐	☐