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ABSTRACT

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Multitrait-multimethod Analyses of the Self Description Questionnaire: Student-Teacher Agreement on Multidimensional Ratings of Student Self-concept

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Multitrait-Multimethod Analyses of the Self Description Questionnaire: Student-Teacher Agreement on Multidimensional Ratings of Student Self-Concept

The Self Description Questionnaire (SDQ) is a multidimensional instrument designed to measure seven facets of self-concept hypothesized in Shavelson's hierarchical model. Fifth and sixth grade students (N = 654) completed the SDQ and several other instruments. Factor analysis of their responses clearly demonstrated the seven factors that the SDQ was designed to measure. Teachers were also asked to evaluate each student's self-concept along the same seven dimensions, and a multitrait-multimethod analysis offered support for both the convergent and divergent validity of the self-concept dimensions. Not only was there substantial student-teacher agreement on the seven dimensions, but agreement on any one dimension was relatively independent of agreement on other dimensions. The pattern of small correlations among the student self-concept dimensions was generally consistent with those observed for the teacher ratings and those predicted by the hierarchical model upon which the instrument was based. Student and teacher ratings of students' self-concept both showed similar and predictable correlations with attributions for academic achievement, sex of student and reading achievement, thus offering further support for the construct validity of the SDQ.

Multitrait-multimethod Analyses of the Self Description Questionnaire: Student-Teacher Agreement on Multidimensional Ratings of Student Self-Concept

Researchers have given increased attention to self-concept as an important educational variable during the last 20 years (Burns, 1979; Wylie, 1974; 1979). The interest in self-concept stems not only from recognition of the improvement of self-concept as a valued educational outcome, but also from the assumption that self-concept enhancement may serve as a vehicle for the improvement of other outcomes such as academic achievement (Calsyn & Kenny, 1977; Shavelson & Bolus, 1981; Wylie, 1979; but also see Rogosa, 1980). Nevertheless, definitions of self-concept are imprecise, few of the more commonly used instruments have been adequately validated and the empirical search for self-concept factors has been unproductive (Crowne & Stephens, 1961; Marx & Winne, 1978; Shavelson, Hubner & Stanton, 1976; Shavelson & Bolus, 1981; Wylie, 1974; 1979).

Investigations of the construct validity of self-concept measures can be classified as within or between network studies (Marsh & Smith, see Note 1; Marx & Winne, 1978; Shavelson et al., 1976). Between network studies attempt to show that self-concept is distinct from other variables, such as academic achievement, that are hypothesized to be separate constructs. For example, Shepard (1979) demonstrated that self-acceptance and self-description were distinct from acceptance by others, but only marginally separate from each other. Within network studies attempt to show that there are consistent, distinct components of self-concept (e.g., physical, social, and academic self-concepts). Logically, the clarification of within network issues is a prerequisite to meaningful study of between network inferences (Marx & Winne, 1978).

An implicit assumption of most theorists is that self-concept is multifaceted. This assumption is the foundation of the definition presented by Shavelson (Shavelson, et al., 1976; Shavelson & Bolus, 1981) that was used in

the design of the SDQ (Self Description Questionnaire). Self-concept is an individual's perception of self, and is formed through experience with the environment, interactions with significant others, and attributions of his/her own behavior. Self-concept is both descriptive and evaluative. Self-concept is multifaceted and hierarchically organized, with perceptions moving from inferences about self in subareas (e.g., academic -- reading and math), to broader areas (e.g., academic and nonacademic), and finally to general self-concept. The organization of self-concept becomes increasingly multifaceted as an individual approaches adulthood, and will depend upon the particular category system developed by an individual and shared by a group. In spite of the pervasiveness of the assumption of a multifaceted self-concept, empirical support for the assumption has been modest. Most attempts to demonstrate the multidimensionality of self-concept have relied upon factor analysis or multitrait-multimethod (MTMM) analysis.

Factor analytic studies typically combine exploratory and confirmatory modes of the approach. In the exploratory mode, the researcher simply factor analyses responses and tries to identify the factors that emerge. In the confirmatory mode, the attempt is to demonstrate empirical support for the set of dimensions that the instrument was designed to measure. If the match between the hypothesized and obtained factors is reasonably good, then there is support for both the construct validity of the particular instrument and the multidimensionality of self-concept. Typically there is not a clear match and then the interpretation is ambiguous. This ambiguity is particularly likely when factor analysis has not been used in the development of the instrument.

Numerous studies have factor analyzed self-concept instruments, and generally find evidence for more than one factor (see Marsh & Smith, see Note 1; Shavelson, et al., 1976; Wylie, 1974; 1979 for reviews). However, taken

together, these studies have not led to a clear understanding of the dimensions of self-concept. Derived factors tend to be difficult to interpret, inconsistent across different samples, unable to be replicated, or not clearly related to the scales that the instrument was designed to measure.

Multitrait-multimethod analyses (Campbell & Fiske, 1959; Marsh & Smith, see Note 1; Shavelson, et al., 1976; Wylie, 1974; 1979) has also been used in attempts to demonstrate the multidimensionality of self-concept. With this procedure, different self-concept traits (e.g., social, physical and academic self-concepts) are each assessed by different methods (e.g., self-ratings, peer-ratings, and teacher-ratings). Convergent validity refers to agreement between two methods of assessing the same trait (e.g., student-teacher agreement on students' academic self-concept). Discriminant (or divergent) validity refers to the distinctiveness of the various traits and is inferred from the relative lack of correlation between different traits.

Campbell and Fiske (1959) proposed four criteria for inferring convergent and divergent validity. Those authors and others (e.g., Marsh & Hocevar, 1980) have discussed the criteria in general terms. In the present application, both students and teachers are asked to judge students' self-concepts for seven different dimensions. Consequently, the Campbell-Fiske criteria will be discussed in terms of this particular application. The four guidelines are:

Convergent Validity

1) Convergent validities (student-teacher agreement on the same dimensions of self-concept) should be substantial. Failure of this test indicates that students and teachers are judging different characteristics, that at least one of these indicators of self-concept lacks validity, and precludes the demonstration of discriminant validity.

Discriminant Validity

2) Student-teacher agreement on the same trait (convergent validities) should be higher than corresponding correlations between student and teacher ratings of different traits. Failure of this test implies that agreement on a particular trait is not independent of agreement on other traits, perhaps suggesting a more general dimension of self-concept that encompasses other dimensions. The existence of a generalized self-concept does not preclude the satisfaction of this criterion, but does require that the extent of agreement on a specific component is higher than could be expected on the basis of the generalized agreement alone.

3) Student-teacher agreement on the same trait should be higher than correlations between: 1) student ratings of that trait and other student ratings and 2) teacher ratings of that trait and other teacher ratings. Failure of this test, particularly if correlations among traits approach the reliability of the traits, suggests a method/halo effect. Alternatively (or in addition) the high correlations may mean that the different traits actually are correlated (see criterion 4).

4) The pattern of correlations should be similar for both the student and teacher ratings. Satisfaction of this criterion implies that the self-concept dimensions are truly correlated (independent of method), and might suggest a hierarchical ordering of the dimensions such as those proposed by Shavelson.

Convergence in MTMM studies is inferred from the magnitude of agreement between different methods of assessing the same traits. Divergence is inferred from the relative lack of correlations among the different traits compared to

the convergence coefficients. However, a critical issue is how different the 'different' methods actually are. Logically, the more similar the various methods, the higher the convergent coefficients are likely to be. Yet, evidence for divergent validity is also based upon the size of the convergent coefficients and thus depends upon the choice of different methods. MTMM studies based upon 'different' methods that are really quite similar will be more likely to demonstrate both convergent and divergent validity. For example, researchers have employed MTMM analysis in situations where the 'different' methods are really quite similar (ratings of the same manuscript by different reviewers -- Marsh & Ball, in press; scores on different random halves of the same self-concept instrument -- Shavelson & Bolus, 1981; scores on the same self-concept instrument administered at two different times -- Marsh & Smith, in press). In these examples, the convergence coefficients refer to reliability or stability rather than to validity. The examination of Campbell-Fiske criteria is still meaningful, but support for discriminant validity really only implies that the correlations among different factors do not exceed the reliabilities of those factors. While this demonstration is important, it provides only weak support for the construct validity of students' ratings of self-concept.

More frequently, researchers administer more than one self-concept instrument to the same group of students as the basis of MTMM analyses (e.g. Marsh & Smith, see Note 1; Marx & Winne, 1978; also see Wylie, 1974; 1979) However, if the two 'different' instruments are both self-report measures that have been constructed along similar principles (e.g., Shavelson & Bolus, 1981 considered alternative forms of the same instrument), the convergence coefficients are really more like reliability coefficients. When the instruments are independently constructed and may even involve somewhat different modes of responding, convergence coefficients may be testing a level of generality beyond that which is normally considered to be

an indication of reliability -- but not much. Even here the 'different' methods both involve two self-report surveys that are completed by the same person and are subject to many of the same biases that will tend to inflate the observed convergence coefficients. There is still no basis for assuming the generality of the self-concept construct beyond the student's own personal, private reality.

To provide stronger support for the construct validity and generality of self-concept instruments, MTMM studies need to use 'different methods' that are more radically different than those that have been employed. Perhaps the reluctance to do this stems from the contention that self-concept is such a highly personal, complicated, and private construct that there are no suitable criteria other than a person's own reports. This argument, however, denies the logic of construct validation. Construct validation requires the exploration of a wide variety of different indicators that are logically related to a hypothetical construct. By its very nature as a construct, there is no perfect indicator of self-concept let alone a perfect criterion against which to validate it. There are, however, numerous variables which should be logically related to dimensions of self-concept. Perhaps the most readily available are the impressions of different people who have a sufficiently intimate relationship with a subject to be able to infer his/her different self-concepts. These might include parents, siblings, peers, teachers, therapists, or spouses. Other possible variables include the systematic observations by trained observers, the frequency or intensity of specific behaviors, or the results of a skill inventory designed to parallel the dimensions of self-concept (e.g., physical, social, and academic skills).

The purpose of the present investigation is to demonstrate the construct validity of the Self Description Questionaire (SDQ) through the application of

both factor analysis and multitrait-multimethod analyses. The SDQ is designed to measure seven dimensions of self-concept. In the first stage of the study, empirical confirmation of these scales is sought through the application of factor analysis. As part of the same study, teachers were asked to judge student self-concepts on each of the seven dimensions that are measured by the SDQ. In the second stage of the analysis, multitrait-multimethod analyses are used to study student-teacher agreement. In the third stage of the analysis, predictable relationships between self-concept dimensions and other constructs are explored to provide further evidence for the construct validity of the SDQ.

Method

Sample

The sample contained 654 students (354 females, 300 males) attending one of six coeducational public schools in the inner city area of Sydney, Australia. The sample consisted of all the 5th grade (16 classes) or 6th grade (14 classes) in these schools. Age of these students ranged from 114 to 158 months (Mean age = 132.5, Standard deviation = 8.3 months). Children in these schools tended to come from families in the lower-middle and lower social classes, and to be below average in academic performance.

Students were asked to complete two self-report surveys and a standardized reading achievement test. The self-report surveys were read aloud to students to reduce complications related to reading ability, although this precaution was unnecessary for most of the students. All three instruments were administered by the same research assistant in order to standardize the testing conditions.

During the time that students were completing the three instruments, the classroom teachers were asked to provide judgments about each student's self-concept. Specifically, teachers were instructed:

> Self-concept or self-esteem is based upon a pupil's own perceptions and feelings about him/herself. These would include feelings of self-confidence, self-worth, self-acceptance, and ability. Please evaluate the pupil's self-concept, using your perceptions of the pupil's own feelings in each of the areas listed below.

Teachers were then presented with a list of seven dimensions of student self-concept corresponding to those being measured in the student sample. Teacher ratings were made along a nine-point response scale that varied from "1 - Very Low Self-concept" to "9 - Very High Self-concept". Teacher ratings of students' self-concept were obtained for 623 of the 654 students. Approximately one-third of the missing values were from a single classroom where the teacher indicated that he was unable to comply with the request, while the others were widely spread across different classes.

Instruments

SDQ. The Self Description Questionnaire (SDQ) was specifically designed as part of this study. An earlier version of the instrument, containing 100 items, had been designed to measure dimensions of self-concept proposed in the theoretical framework presented by Shavelson (Shavelson, et. al., 1976; Shavelson et al., 1981). On the basis of factor analysis, 66 items were selected, revised or rewritten for inclusion in the present instrument (see Table 1 for the actual wording of the items). Each of the four non-academic scales (Physical Abilities, Appearance, Relations With Peers, and Relations With Parents) were measured by eight positively worded items (e.g., I am good looking) and one negatively worded item (e.g., Most kids have more friends than I do). Three academic scales (Reading, Mathematics, and All School Subjects) were each measured by 10 parallel items. Within each of these three scales there were five cognitive items and five affective items. The actual items, with the five affective items appearing first, are presented in Table 1. Four of the five cognitive items were positively worded (e.g., I'm good at...) and one was negatively worded (I am dumb at...). Similarly, four affective items were positively worded (e.g., I am interested in..) and one was negatively worded (e.g., I hate...). After first being given instructions and considering several examples, students responded to each item with a

five-point response scale ("True", "Mostly True", "Sometimes False, Sometimes True", "Mostly False", and "False"). Responses were made by putting an "X" in one of five spaces.

Preliminary investigation consisted of determining the internal consistency of each of the scales and searching for poor items. Coefficient alpha's (see Hull & Nie, 1981) were consistently high, but each of the four non-academic scales contained one item that failed to correlate with other items in the same scale. Consequently, these four items (out of a total of 66) were dropped from further consideration. Three of these items were negatively worded items, and even the remaining seven items that were negatively worded tended to contribute less to the internal consistency of their scales than did other items. After the exclusion of the four bad items, coefficient alphas for the seven dimensions ranged from .80 to .92.

IAR. The Intellectual Achievement Responsibility (IAR) scale was developed for "assessing children's beliefs that they, rather than other people, are responsible for their intellectual-academic successes and failures" (Crandall, Katovsky & Crandall, 1965, p. 91).

Children who internalize responsibility for academic successes may attribute responsibility to either high ability or high effort. Similarly, internalization of responsibility for failure may indicate some combination of lack of ability or effort. Although not originally designed to do so, many of the IAR items specifically imply either ability or effort. Consequently, Dweck (1975; Dweck & Reppucii, 1973) has suggested four separate subscales: success due to ability, success due to effort, failure due to lack of ability, and failure due to lack of effort. Each of these four subscales and various combinations of the four were correlated with self-concept measures in the present study.

PAT. The measure of reading achievement used in this study is the reading comprehension section of the Progressive Achievement Tests developed and normed by the Australian Council of Educational Research (ACER, 1973). The items actually administered to students vary according to grade level. Approximately 2/3 of the items administered to fifth and sixth grade students are actually identical, but the additional 1/3 administered to fifth grade students are somewhat easier while those administered to sixth graders are more difficult. Students are allowed 40 minutes to complete the test.

The average scores of students in this study (12.0 for grade 5 and 13.5 for grade 6) are far below the national averages, but are similar to those reported in earlier research involving many of the same schools (Turney, Inglis, Sinclair & Straton, 1978). Coefficient alphas (Hull & Nie, 1981) were reasonably high for both groups (.82 & .83), but several factors suggest that these values may be substantially inflated. For both samples the average percentage of correct response was about 30%, and was only marginally higher than a chance guessing level. Furthermore, the pattern of responses indicates that many of the more difficult items (those appearing near the end of each test) were not even attempted by a majority of the students and that the percentage of correct responses for these items was significantly below chance. Consequently, the coefficient alphas are likely to be substantially larger than might be expected if reliability had been estimated from alternative forms of the same test administered on two occasions. Furthermore, the difficulty of the test -- relative to the ability level of the students in this particular study -- also dictate caution in the interpretation of the test scores.

For purposes of this study, total reading scores were standardized separately for the fifth and sixth grade samples. After standardization, each group had total scores with a mean of 0.0 and a standard deviation of 1.0.

Teacher Ratings

When teachers (or any other judges) are asked to make judgments there are several sources of error. Not only is there error in the relative ranking of each student, but teachers will also differ in terms of the average and variability of their responses. For example, one teacher may only use the top categories, a second might use all the different categories, and a third may use only the bottom categories. When the ratings of many different teachers are combined and no two teachers make judgments of the same student, these response biases can produce serious distortions. However accurately teachers can rank students in terms of student self-concept, response biases in the way different teachers use the response scale will attenuate the observed relationship with the corresponding student ratings. The operation of these response biases may also tend to increase the correlations between the teacher ratings of the different self-concept dimensions, and make them appear to be less distinct.

Inspection of the teacher ratings and the high correlations among the different dimensions suggests that there are probably response biases due to the way teachers used their response scale. A one-way ANOVA in which the 30 groups consisted of ratings of students in one classroom made by the same teacher revealed that more than one-quarter of the variance in teacher ratings was due to the particular teacher making the rating. In contrast, a similar ANOVA performed on student ratings indicated that only about 5% of the variance could be explained. While some of the differences in teacher ratings may reflect "real" differences in self-concept, it seems likely that much of this variance reflects response biases. Several alternative approaches as to how to remove this response bias are explored.

The first, more conservative, approach is to assume that teachers are only capable of making relative judgments about the self-concepts of students within

their own classroom, and that differences in the distributions of responses made by various teachers reflects only a response bias. If this assumption is true, then the response bias can be eliminated by standardizing the ratings made by each teacher to have the same mean and standard deviation. This was accomplished by standardizing the teacher ratings within each class to have a mean of 0.0 and a standard deviation of 1.0 for each self-concept dimension. For purposes of this study, these will be called Standardized Teacher Ratings. Analyses based upon these Standardized Teacher Ratings, when compared to unstandardized ratings, revealed somewhat better student-teacher agreement and lower correlations among the teacher ratings of different self-concept dimensions.

The use of Standardized Teacher Ratings assumes that there are no real differences in self-concepts for students in different classrooms, or at least that teacher ratings of self-concept are not capable of reflecting these differences. This assumption appears to be overly conservative, particularly in light of the analyses that suggest that there are significant differences among classes in student ratings of their own self-concept. An alternative, less conservative solution, is to find a criterion of student self-concept that is separate from the teacher ratings and to use this to scale the ratings of each teacher. In the present investigation the best estimate of student self-concepts is the actual ratings made by the students. Consequently, the student responses were used to scale the teacher ratings. This was accomplished by setting the mean and standard deviation of the ratings of each of the 30 teachers equal to the mean and standard deviation of the responses made by their students (Student Factor Scores). For example, if students in a particular classroom indicated that their Reading self-concept was half a standard deviation above the mean of of all students, then the corresponding mean of their teacher's ratings of

Reading self-concept was also set at half a standard deviation above the mean of all teacher ratings. Since the same linear transformation was applied to all responses made by a given teacher to any particular self-concept dimension, the relative ranking of students within the classroom was not altered. This scaling approach uses some of the information from student ratings to scale teacher ratings. However, since the ratio of students to teachers is high (more than 20 to 1), the amount of information actually used is rather small. For purposes of this study, these will be called Adjusted Teacher Ratings. The extent of student-teacher agreement based upon both the Standardized and Adjusted Teacher ratings will be compared in findings to be discussed later.

Results

Factor Analysis

Factor analysis of the student self-concept ratings (see Table 1) clearly identifies the seven factors the instrument is designed to measure and an additional factor that is defined by affective items from all three academic scales. A variety of other factor solutions was also explored. Solutions that considered only seven factors typically contained four academic factors and only three of the four nonacademic factors. Solutions that contained nine factors typically included the eight that are presented in Table 1 and an additional factor comprised primarily of negatively worded items. When more than nine factors were rotated, the additional factors had few if any substantial loadings and were not readily interpretable. However, when eight factors are considered the seven factors the instrument was designed to measure are clearly evident and the eighth factor is also easily interpretable.

Insert Table 1 About Here

Factor score coefficients were generated from the factor analysis presented in Table 1 and used to construct factor scores (see Nie, et al., 1975). Correlations among the seven factors the instrument was designed to measure and the reliability of these scales are shown in Table 2. These correlations vary from close to zero to .42 (Mn r = .24), while the reliabilities of the scales are in the .80's and .90's. This, along with the clarity of the factor solution, argues for the distinctiveness of the various dimensions. Nevertheless, the pattern of correlations among the factors is generally consistent with Shavelson's hierarchical model. His model predicts substantial correlations among the three academic factors, between the two social factors (Peers and Parents), and between the two physical factors (Abilities and Appearance). With one exception, each of these correlations is higher than the average of all the correlations. The one exception is the near zero correlation between Mathematics and Reading self-concepts. Also, the high correlations between the Peers factor and the two physical factors was somewhat unexpected. It is not clear whether these unexpectedly high correlations represent a problem with the instrument, a problem with Shavelson's model, or just an inclination for young children to select friends on the basis of physical attributes.

In summary, the factor analysis provides strong support for the dimensions that the instrument is designed to measure and the theoretical model upon which the instrument was based. Items load substantially on the factor they are designed to measure and not other factors; correlations among the various factors tend to be small; and those correlations that are observed tend to be consistent with the Shavelson model upon which the instrument is based.

Student-Teacher Agreement on Self-Concept

Construct validity is typically demonstrated by showing that multiple

indicators of the same construct are substantially correlated. However, Campebll & Fiske argue that two aspects of construct validity should be considered. Not only should multiple indicators of the same construct be substantially correlated (convergent validity), but indicators of different constructs should not be substantially correlated (divergent validity). In the present investigation, both students and teachers were asked to judge student self-concepts on the seven dimensions measured by the Self Description Questionnaire (SDQ). This is not to say that teacher ratings should be considered as a criterion measure for the student ratings. Rather, it was felt that teachers who spend the entire day with the same group of students should be able to provide one indicator of student self-concept.

Two different multitrait-multimethod (MTMM) matrices are summarized in Table 2.[1] Factor scores derived from the student ratings were correlated with both the Standardized Teacher Ratings (correlations above the main diagonal) and Adjusted Teacher Ratings (correlations below the main diagonal). Convergent validities are the underlined values in the lower-left and upper-right submatrices. These convergent validities demonstrate good student-teacher agreement on the different dimensions of self-concept. Agreement is best in the areas of Mathematics, Physical Abilities, and All School Subjects, while agreement is weakest for Relations With Parents.

Insert Table 2 About Here

Application of the Campbell-Fiske guidelines to the two MTMM matrices reveals that:

1) there is good evidence for convergent validity (criterion 1);
2) convergent validities are virtually always higher than other correlations in the same row or column of the same (criterion 2);

3) convergent validities are generally higher than the corresponding correlations among the student ratings (criterion 3);

4) convergent validities are generally not higher than the corresponding correlations among the same teacher ratings (criterion 3);

5) the pattern of correlations among the student rating dimensions is similar to that observed among teacher ratings (criterion 4).

Taken together, these findings offer strong support for both convergent and discriminant validity of the student ratings of self-concept. There is at least moderate student-teacher agreement on all the self-concept dimensions with the possible exception of Relationship With Parents. This is the one area where teachers are least likely to observe students, and the one about which they expressed the most hesitancy in making judgments. Student-teacher agreement on any one dimension appears to be reasonably independent of their agreement on other dimensions. The relatively modest correlations that do exist between the various student rating dimensions are similar to those predicted by the Shavelson model and those observed among the teacher ratings. While there is evidence for a method/halo effect in the teacher ratings, there is little suggestion of this effect with the student ratings.

Multitrait-multimethod matrices can also be summarized with an ANOVA model. The model has shortcomings and there is not a clear equivalance between it and the Campbell-Fiske criteria (Marsh, in press; Marsh & Hocevar, 1980; Schmidt, Colie & Sarr, 1979). Nevertheless, it offers a convenient summary of the magnitude and statistical significance of three effects; convergent validity, divergent validity, and method/halo bias. Application of this model (see Table 2) indicates that each of the three effects are statistically significant. The principal difference between the two analyses is that for Adjusted Teacher Ratings, the divergent validity effect is the largest of the three effects and larger

than the divergent effect found in the analysis of standardized Teacher Ratings. These findings support the interpretations based upon application of the Campbell-Fiske criteria.

Further investigation of the multitrait-multimethod matrices reveals additional support for the hierarchical model posited by Shavelson. For both student and teacher ratings, the highest correlations exist for the three academic factors, the two physical factors, and to a lesser extent the two social factors. Correlations among the teacher ratings also corroborate the high relationship between the two physical factors and the Peer factor that was discussed earlier. Particularly since the teacher ratings were based upon the factor labels representing the SDQ dimensions rather than the actual SDQ items, the relationship between the Peer factor and the two social factors does not seem to be a function of the SDQ instrument. The major difference in the pattern of correlations among student ratings and the pattern among teacher ratings occurs for the correlation between Reading and Mathematics self-concepts. The high correlation between teacher ratings of these two dimensions, unlike the near zero correlation found with student ratings, supports the Shavelson model.

The lack of correlation between student ratings of self-concept in Reading and Mathematics runs counter to intuition, the Shavelson model and the teacher ratings of student self-concept. A partial explanation might lie in the design of these factors to contain both cognitive and affective components. For example, the two cognitive components (i.e., cognitive ability in Math and Reading) could be positively correlated while the two affective components are negatively correlated. The exploration of these separate components did indicate that the cognitive components of the student self-concept ratings are more highly correlated with teacher ratings than are affective components. However, correlations between the two cognitive components of student self-concept (i.e., in Reading and Mathematics) and the two affective components are both quite small. Thus it appears

that student ratings of self-concept in Reading and Mathematics are relatively independent of each other, and that this relative independence is consistent for both cognitive and affective components of the ratings.

Results summarized in this section demonstrate that student ratings of self-concept show both convergent and discriminant validity. Not only is there student-teacher agreement on ratings of self-concept, but agreement on any particular dimension of self-concept is relatively independent of agreement on other dimensions. Furthermore, the relatively small correlations that are observed among the different self-concept dimensions are generally consistent with the hierarchical model upon which the instrument was based. These findings demonstrate the multidimensionality of self-concept, and also dictate extreme caution in the interpretation of any global measure of self-concept that is not derived from an instrument with a known factor structure.

Attributions for Academic Achievement

The attribution of causes for academic success and failure have important implications for academic settings (see Dweck, 1975; Weiner, 1980). The most commonly attributed causes are ability and effort, but perceived causes may also include luck, task difficulty, and a host of other idiosyncratic factors. These perceived causes can be classified along dimensions of locus (internal or external causes) and control (causes under control of the student or not), as well as others (see Weiner, 1980). For example, students can internalize responsibility for academic outcomes by attributing them to ability and effort, or they can externalize responsibility by attributing outcomes to such environmental factors as luck or task difficulty.

Students in the present study completed the IAR scale (Crandall, et al., 1965; Dweck & Reppucci, 1973). The IAR consists of 34 forced-choice items asking

students to attribute success or failure for academic outcomes (e.g., success or failure on an exam) to either internal (e.g., high ability or effort) or external (e.g., luck or test difficulty) causes. The number of internal responses is a measure of academic locus of attribution that varies from external to internal. Crandall (Crandall, et al., 1965) originally computed separate scores for success and failure items. Dweck (Dweck & Reppucci, 1975) further divided the IAR items into those reflecting ability and effort, thus forming four scales. High scores on these scales represent attributions of : 1) ability (vs. external causes) in success situations; 2) effort in success situations; 3) lack of ability in failure situations; and 4) lack of effort in failure situations.

Self-concepthas generally been linked with the tendency to internalize responsibility (Burns, 1979; Chandler, 1976; Smith, 1978). This generalization is reasonable for successful outcomes, but not for failure outcomes (see Smith, 1978). A high self-concept is consistent with attributions of ability and effort, but not with attributions of a lack of effort and particularly not with attributions of a lack of ability. Persons with a high self-concept may be willing to attribute failure to their own lack of effort, since a more favourable outcome that is consistent with their positive self-concept might be expected with more effort. However, ability cannot be so easily controlled, and so it is less likely that a person would attribute failure to a lack of ability. These suggestions imply that self-concept will be most positively correlated with ability and effort attributions in success situations and negatively correlated (or least positively correlated) with ability attributions in failure situations. Attributions of effort in failure conditions are expected to be somewhat more positively correlated (or less negatively correlated) with self-concept than are attributions of ability in failure situations.

Various subdivisions of the IAR are correlated with both student and teacher ratings of students' self-concept (see Table 3). In general, the pattern of predicted relationships is supported for both student and teacher ratings of self-concept. The IAR is specifically limited to academic situations, and the pattern of relationships is most clear for the academic dimensions of self-concept--particularly the Total Academic self-concept that is the sum of the three academic scales. Academic self-concept -- in both student and teacher ratings -- is positively related to attributions of ability and effort in success situations, somewhat negatively related to attributions of ability in failure conditions, and almost unrelated to attributions of effort in failure conditions. Separate analyses demonstrated similar patterns existed for both males and females. The disappointingly low magnitude of the relationships can be attributed to the unacceptably low reliabilities of the IAR scale. The size of these correlations would be considerably larger if they were corrected for attentuation.

Insert Table 3 About Here

Predictably, all the various combinations of the four subscales except the Total Success score, show less relationship with self-concept than do either the success-ability or the success-effort scales. It is also interesting to note that a total IAR score where the failure-ability items are reflected (X Total in Table 3) correlates more positively with self-concept than does the normal total score.

In summary, attributions for responsibility for academic success and failure demonstrated a predictable pattern of relationships to student self-concept. Attributions of ability and effort in success situations were most

highly correlated to academic self-concept, followed by effort attributions in failure situations, and finally ability attributions in failure situations. This pattern was evident in both student and teacher ratings of self-concept, was evident for both male and female self-concepts and was particularly evident for academic self-concept. In spite of the clarity of this demonstration, further research needs to replicate this finding with an academic attribution measure that more clearly differentiates between ability and effort, and that achieves a more acceptable level of reliability.

Relationship to Other Variables

Sex Differences. Wylie (1968) concluded that most American research has found that girls between the ages of eight and thirteen have more positive self-concepts than do boys. In contrast, Burns (1979), emphasizing several Australian studies, reported that boys have increasingly more positive self-concepts starting in the late primary grades. Australian boys reported slightly more favourable self-concepts at ages 11 and 12, but the size of the difference grew increasingly larger through age 18 (Conhell, Stroobant, Sinclair, Connell & Rogers, 1975). Smith (1975, 1978) also reported that Australian boys generally had better self-concepts on each of the dimensions of the Sears (1964) Self-Concept Inventory. Across two studies Smith found large and consistent differences in the physical scales and several academic scales, but smaller or nonsignificant differences in social factors. However, in one of the same studies, Smith (1978) found no sex differences in scores for the Coopersmith (1959) Self-Esteem Inventory. Burns (1979) also cautioned that sex differences on any particular self-concept scale might be an artifact of unintentional sexual biases in the wording of items. In summary, the relationship between sex and self-concept may depend upon age, nationality, the self-concept instrument being used, the wording of items, and the particular aspects of self-concept that are being emphasized. In spite of these ambiguous findings, several sex differences on the SDQ can be predicted on the basis of sexual stereotypes. Boys should have better self-concepts in Physical Abilities and Mathematics, while girls should have better

self-concepts in Reading.

The relationship between sex and both student and teacher ratings of students' self-concept is shown in Table 4. Boys rate their self-concept to be substantially higher in the areas of Physical Abilities, Mathematics, and to a lesser extent in Appearance. Girls rate their self-concepts to be higher in Reading, and to lesser extents in All School Subjects and Parental Relations. This pattern of findings is closely paralleled by sexual differences in teacher ratings of students' self-concept, though only four of the relationships reached statistical significance. The similar pattern of relationships of student and teacher responses is particularly important. Since students responded to individual items while teachers judged overall dimensions, it is unlikely that the findings are due to the particular wording of SDQ items. These findings clearly demonstrate, at least in this study, that sex differences in self-concept depend upon the particular dimension being considered and that the most dramatic differences (e.g., Physical Ability, Reading, and Mathematics) are consistent with well established sexual stereotypes.

Insert Table 4 About Here

Age & Year In School. The relationships between age and year in school, and the various self-concept dimensions are small and generally fail to reach statistical significance (see Table 4). However, given the limited age range that was included in this study, this finding may have little relevance to establishing any general relationship between self-concept and age. In further analysis of these variables, linear and nonlinear relationships between age and self-concept were determined separately in fifth and sixth grades. It was reasoned that children who are older or younger than their classmates may also differ in self-concept. However, polynomial regression analyses resulted in little or no evidence for linear or nonlinear relationships in either grade.

Reading Achievement. Academic achievement is generally correlated with self-concept, and even more highly correlated with measures of academic self-concept (Shavelson, et al., 1976; Shavelson, et al., 1981; Wylie, 1979). This relationship is particularly strong when students' self-concept is determined by asking them to rank themselves against their classmates (or some other comparison group) in terms of the academic achievement being measured (e.g. Brookover, Le Pere, Hamachek, Erickson, Note 1; Nicholls, 1976). Such correlations are expected and contribute to the construct validity of self-concept. However, Shavelson & Bolus (1981) caution that the pattern of relationships must not be so strong that academic self-concepts cannot be distinguished from academic achievement and school grades.

The relationships between reading achievement and both teacher and student ratings of self-concept are shown in Table 4. As predicted by Shavelson's model, reading achievement is most highly correlated with self-concept in Reading, followed by All School Subjects, then Mathematics, and then the four non-academic self-concepts. The same pattern is evident in both student and teacher ratings of self-concept, though teacher ratings are consistently more positively correlated with reading achievement. This suggests that teacher ratings of students' self-concept are more heavily influenced by actual reading ability than are student ratings of their own self-concept.

The pattern of relationships between reading achievement and self-concept scales adds further support to the construct validity of the SDQ. However, the modest size of the correlations was somewhat unexpected. While certainly satisfying Shavelson's concern that the correlation might be so high that the constructs of achievement and self-concept cannot be distinguished, it was expected that the observed relationship would be higher. A possible explanation

for this low correlation lies in the combination of the test difficulty, the time limits on the test, and the low reading ability of the students. The reliability (coefficient alpha) of the test was high, but the estimate may have been inflated by the fact that many children completed only a small portion of the items.

Summary. The relationship between dimensions of self-concept and several other variables has been explored in this section, and these findings offer further support for the construct validity of the SDQ. Male-female differences on the SDQ dimensions closely paralleled both the differences observed in teacher ratings and traditional sexual stereotypes. The relationship between the SDQ dimensions and reading achievement also corresponded to both those observed with teacher ratings and predictions based upon Shavelson's hierarchical model. The similarity of the pattern of results based upon student and teacher ratings of self-concept strengthens the findings. This is particularly important since the two groups responded to quite different surveys, thus arguing against the contention that the relationships were a function of the wording of SDQ items.

Discussion

The Self Description Questionaire was designed to measure seven facets of self-concept that were hypothesized in Shavelson's hierarchical model. The purpose of this study was to demonstrate the construct validity of the SDQ. This was accomplished by a factor analysis of the student ratings of self-concept, a multitrait-multimethod analysis of student and teacher ratings of students' self-concept, and an investigation of the pattern of correlations among the self-concept dimensions and other variables. The factor analysis of the student ratings clearly demonstrated the seven dimensions of self-concept that the SDQ

was designed to measure. The multitrait-multimethod analysis supported both the convergent and divergent validity of the self-concept dimensions. Student-teacher agreement on the self-concept dimensions was significant, and agreement on each dimension was relatively independent of agreement on other dimensions. Finally, student and teacher ratings of the seven dimensions of self-concept both demonstrated similar and predictable correlations with attributions of academic achievement, student sex, and reading achievement. Taken together, these findings provide strong support for the multidimensionality of self-concept and the construct validity of the SDQ.

An interesting decision in the design of this study involved the form used to collect teacher ratings of the students' self-concept. Originally, it was felt that asking teachers to respond to the same 66-item survey that was completed by each student would be best. However, completing such a long survey for each student in the class would be an unrealistic request. Consequently, each teacher was only asked to judge student self-concepts on summary descriptions representing the seven SDQ dimensions. The necessity of this alternative solution had the undesirable effects of probably: 1) reducing the degree of convergent validity that might otherwise have been expected if teachers had actually responded to the same stimulus materials as did their students; and 2) increasing the likely correlations among teacher ratings of the seven dimensions. However, the compromise solution also resulted in several advantages. First, since teacher ratings were based upon such a different type of survey, the generality of the convergent validities is even greater than if they had been based on the same form with the same wording of items. Second, the similarity of the pattern of relationships between both student and teacher ratings and other variables considered in the study is

unlikely to be a function of the specific wording of SDQ items. Consequently, while the alternative solution probably weakened support for the convergent and divergent validity, it also increased the generality of the findings.

In spite of continued pleas for the need of MTMM analyses in self-concept research (e.g., Shavelson, et al., 1976; Wylie, 1974; 1979) relatively few such studies have been conducted. Furthermore, the 'different methods' that are typically considered by the studies that have been conducted are often so similar that the convergence coefficients are actually assessing reliability rather than validity. This means that the Campbell-Fiske criteria of discriminant validity are comparing the size of correlations among different traits with the reliability of the traits. The successful demonstration of convergent and divergent validity under these circumstances is a necessary and important issue, but it provides only weak support for the construct validity of the self-concept dimensions. In constrast to most previous research, the MTMM analyses described in this study employed truly different methods of assessing the self-concept dimensions. In addition to the theoretical constributions, it is encouraging that classroom teachers demonstrated modest ability to infer student self-concept. Hopefully other researchers will design MTMM studies that also employ 'different' methods that are more different than two self-report surveys completed by the same student.

The findings of this study, as well as supporting the construct validity of the SDQ, also provide support for the Shavelson model upon which the instrument is based. Shavelson hypothesized that self-concept is multifaceted and proposed what many of the most important facets might be. The success of the SDQ provides strong support for the multidimensionality of self-concept and seven of the facets that Shavelson proposed. Shavelson also argued that the different self-concept facets were hierarchically arranged, and provided clear predictions about the pattern of correlations that might be expected between the various factors.

Generally, the predicted pattern of correlations was quite consistent with those that were observed among both the student and teacher ratings of the various self-concept dimensions.

Although not strongly emphasized, the design of the academic self-concept items in the SDQ is quite different from that of most other instruments. Other instruments (e.g., Brookover, 1965; Nicholls, 1976) typically ask students to rank their academic ability against that of their classmates or other hypothetical comparison groups. This led Shavelson (Shavelson & Bolus, 1981) to voice the concern that such academic self-concepts might be nothing more than students' reports of their grades or academic achievement. In contrast, the academic self-concepts on the SDQ consist of a wider variety of items including those specifically designed to measure affective (i.e., interest in and liking for a subject area) as well as cognitive components. This cognitive-affective distinction has not been recognized in Shavelson's model, nor has it been emphasized by other researchers. However, the identification of an additional eighth factor in the SDQ that consists of affective items from each of the three academic scales suggests that this factor may prove to be important in future research. Having raised this issue, it is the role of future research to decide how broadly academic self-concept should be defined and whether or not it should include an affective component.

Footnotes

1. Two MTMM analyses besides those reported in study were also conducted. Student-teacher agreement was determined first by correlating unweighted student ratings (i.e., the mean response to items in each scale rather than factor scores) and unstandardized teacher ratings, and second by correlating student factor scores with unstandardized teacher ratings. summarizing these two analyses, the mean convergent validities were .25 and .25; mean heterotrait-meteromethod (excluding convergent validities) coefficients were .07 and .05; the mean correlations between student rating dimensions were .25 and .16; the mean correlations between teacher rating dimensions were .49 and .49.

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TABLE 1

Factor Analysis of Pupil's Responses (N=655) to the Self Description Questionnaire

	Self-concept Items (paraphrased)	Oblique Factor Pattern Loadings							
		I	II	III	IV	V	VI	VII	IIX
I	PHYSICAL ABILITIES								
	38 I am good at sports	78	06	00	02	-06	-10	05	06
	52 I am a good athlete	65	12	06	-06	-03	-13	10	04
	10 I like to run and play hard	55	00	07	00	03	08	-08	02
	24 I enjoy sports and games	53	-15	03	13	08	05	-05	03
	3 I can run fast.	53	16	02	-06	04	-01	-04	00
	59 I'm good at throwing a ball	46	00	16	08	02	00	02	-03
	45 I'm good at aiming at targets	42	05	09	01	-03	12	03	-05
	31 My body is strong and powerful	34	26	16	-01	-01	06	-04	-05
II	APPEARANCE								
	1 I am good looking	09	72	03	03	03	00	-05	00
	43 I have a good looking body	11	68	06	-02	-01	06	00	01
	15 I have a pleasant looking face	00	67	08	03	02	02	04	-02
	22 I am an attractive person	02	65	14	-02	04	06	01	00
	50 I'm better looking than most of my friends	12	64	06	04	-01	03	03	-06
	36 Other kids think I am good looking	-04	63	24	-02	-01	-05	06	06
	8 I like the way I look	07	58	02	08	07	06	01	02
	57 I have nice features (for example, nose & eyes)	07	56	01	14	04	-05	15	02
III	RELATIONSHIPS WITH PEERS								
	14 I make friends easily	00	-04	69	06	02	05	-10	00
	28 I get along with other kids easily	09	-04	63	09	-02	-02	07	00
	7 I have lots of friends	08	-07	58	09	04	-01	-01	00
	42 Other kids want me to be their friend	07	18	50	04	02	-13	07	-06
	63 Most other kids like me	11	24	44	09	-07	-07	13	01
	56 I am popular with kids my own age	09	26	41	08	-02	00	05	-01
	35 I am easy to like	01	34	36	04	01	-03	10	04
	*21 Most kids have more friends than I do	08	06	35	-15	-04	06	01	02
IV	RELATIONSHIP WITH PARENTS								
	54 I get along well with my parents	01	-03	-03	70	-07	00	13	-01
	61 My parents and I have a lot of fun together	-04	08	02	67	-07	-01	04	-03
	47 My parents are easy to talk to	05	07	06	54	-05	07	09	-03
	26 My parents like me	00	03	08	52	15	12	-08	-03
	40 My parents and I spend a lot of time together	01	07	-02	49	03	00	00	02
	33 I want to raise my children like my parents did	03	03	02	44	03	05	-03	07
	5 My parents understand me	06	-03	12	43	01	-01	-02	02
	19 I like my parents	-01	-02	08	36	09	17	-06	-04
V	READING								
	18 I look forward to reading	-03	05	02	01	66	-12	03	31
	11 I like reading	-08	00	05	14	65	-03	-07	20
	25 I am interested in reading	01	01	-02	07	65	-14	-01	32
	39 I enjoy doing work for reading	-05	-04	06	10	61	-14	04	30
	*60 I hate reading	-10	-01	-05	06	48	00	00	18
	53 I'm good at reading	00	08	04	00	69	09	05	-05
	65 I learn things quickly in reading	06	02	04	02	58	00	21	01
	46 Work in reading is easy for me	10	01	08	00	56	03	10	01
	4 I get good marks in reading	02	10	-02	04	54	04	13	-09
	*32 I am dumb in reading	-01	-02	00	04	43	15	07	00
VI	MATHEMATICS								
	34 I am interested in maths	08	02	03	-01	-15	42	00	64
	13 I enjoy doing work for maths	-03	08	08	-05	-17	42	-06	67
	20 I look forward to maths	11	08	05	-03	-14	39	-01	59
	48 I like maths	05	06	00	03	-19	39	06	64
	* 6 I hate maths	-06	-02	-03	-02	-07	37	-05	37
	55 I am good at maths	10	01	01	00	-07	64	25	10
	27 I get good marks in maths	00	10	04	-02	-08	59	29	04
	41 I learn things quickly in maths	15	01	00	02	-05	54	25	09
	62 Work in maths is easy for me	10	02	08	-01	-15	53	33	06
	*66 I am dumb at maths	05	01	02	07	01	46	12	-07
VII	SCHOOL SUBJECTS								
	64 I like all school subjects	02	00	06	07	06	-15	65	41
	51 I am interested in all school subjects	00	01	02	06	06	-12	61	33
	58 I look forward to all school subjects	02	-01	-02	05	04	00	58	43
	9 I enjoy doing work for all school subjects	-04	00	01	05	08	05	45	31
	*44 I hate all school subjects	-04	-04	00	05	19	07	23	24
	30 I learn things quickly in all school subjects	08	-03	12	07	13	19	45	-11
	16 I get good marks in all school subjects	-02	04	04	-07	16	28	43	-17
	37 Work in all school subjects is easy for me	01	12	10	-05	19	23	41	-06
	2 I'm good at all school subjects	06	08	12	-08	14	19	40	-04
	*23 I am dumb in all school subjects	04	-08	10	06	11	23	24	-04

*Negatively worded items have been reflected

Note: All loadings are presented without decimal points. Factor loadings in boxes are loadings for items designed to measure each factor. The factor analysis consisted of a principal-components analysis, Kaiser normalization, and rotation to a

TABLE 2

Two Multitrait-multimethod Analyses: Correlations Relating Student Responses to the SDQ (factor scores) to Adjusted Teacher Ratings (values below the main diagonal) and Standardized Teacher Ratings (values above the main diagonal)

Multitrait-Multimethod Matrices

Student Ratings of Own Self-Concept	S_1	S_2	S_3	S_4	S_5	S_6	S_7	T_1	T_2	T_3	T_4	T_5	T_6	T_7
S_1 Physical Ability	(83)	29	42	10	-02	17	13	40	18	20	00	-07	09	06
S_2 Appearance	29	(90)	42	09	04	07	16	27	18	17	05	07	09	06
S_3 Peer Relations	42	42	(81)	25	07	14	21	20	12	25	07	00	12	13
S_4 Parent Relations	10	09	25	(80)	17	01	09	01	00	00	07	04	07	13
S_5 Reading	-02	04	07	17	(89)	-06	29	-09	-07	-03	07	24	19	30
S_6 Mathematics	17	07	14	01	-06	(92)	38	07	-06	-01	-01	00	41	30
S_7 School Subjects	13	16	21	09	29	38	(85)	03	-04	-01	07	12	30	33
Teacher Ratings of Student Self-Concept	S_1	S_2	S_3	S_4	S_5	S_6	S_7	T_1	T_2	T_3	T_4	T_5	T_6	T_7
T_1 Physical Ability	47	20	20	00	-07	07	28	( )	59	59	24	19	29	33
T_2 Appearance	27	31	19	04	05	08	06	54	( )	56	45	28	31	43
T_3 Peer Relations	20	16	31	09	02	13	18	55	53	( )	44	33	36	46
T_4 Parent Relations	00	00	00	16	07	04	15	18	37	38	( )	31	33	45
T_5 Reading	-07	-08	00	10	31	19	11	17	23	33	29	( )	55	75
T_6 Mathematics	08	-06	-01	-03	00	47	32	27	27	35	27	51	( )	76
T_7 School Subjects	04	-01	03	06	14	32	42	30	40	45	38	71	72	( )

NOTE: All correlations are presented without decimal points. Values in parentheses are reliability coefficients (coefficient alpha's -- See Nie, et al., 1981) for student responses. Reliability estimates were not available for teacher ratings. Underlined values are convergent validities relatting student responses to adjusted teacher ratings (lower left square) and standarized teacher ratings (upper left square). Correlations greater than .08 are statistically significant (p .05).

ANOVA Summary Tables

Source	df	Adjusted Teacher Ratings and Student Responses SS	MS	F-ratio	Var Compt	Standardized Teacher Ratings and Student Responses SS	MS	F-ratio	Var Compt
Convergence	613	1899.7	3.10	7.99**	.194	1934.1	3.16	6.92**	.193
Divergence	3678	3902.6	1.06	2.74**	.337	3515.8	0.956	2.10**	.250
Method/Halo	613	1366.8	2.23	5.75**	.263	1469.9	2.40	5.26**	.277
Error	3678	1426.9	0.39		.388	1676.2	0.46		.456

** p .001

TABLE 3

Correlations Relating Intellectual Achievement Responsibility Scales to Students' Self Concept and to Teacher Ratings of Students' Self-Concept (values in parentheses)

Self-Concept Dimensions	Intellectual Achievement Responsibility (IAR) Scales									
	Success Ability (SA)	Success Effort (SE)	Success Total (SA+SE)	Failure Ability (FA)	Failure Effort (FE)	Failure Total (FA+FE)	Total Ability (SA+FA)	Total Effort (SE+FE)	Total (SA+SE +FA+FE)	XTotal (SA+SE +FE-FA)
1 Physical Ability	.04 (.09)	.06 (..08)	.06 (.10)	-.11 (-.04)	.02 (.08)	-.05 (.03)	-.06 (.03)	.05 (.10)	.00 (.08)	.10 (.12)
2 Appearance	-.01 (.07)	.03 (.06)	.02 (.08)	-.11 (-.06)	-.07 (-.01)	-.10 (-.04)	-.08 (.00)	-.03 (.03)	-.06 (.02)	.03 (.07)
3 Peer Relations	.12 (.12)	.13 (.11)	.16 (.13)	-.09 (.00)	.01 (.09)	-.04 (.06)	.02 (.07)	.09 (.12)	.07 (.12)	.15 (.13)
4 Parent Relations	.11 (.07)	.16 (.05)	.17 (.07)	.09 (.04)	.05 (.08)	.09 (.08)	.14 (.08)	.13 (.10)	.16 (.10)	.13 (.07)
5 Reading	.17 (.24)	.18 (.24)	.21 (.29)	-.03 (.02)	.03 (.09)	.00 (.07)	.08 (.16)	.13 (.20)	.13 (.22)	.17 (.24)
6 Mathematics	.23 (.24)	.17 (.16)	.24 (.24)	-.06 (-.06)	.02 (.06)	-.02 (.01)	.11 (.11)	.11 (.14)	.13 (.15)	.17 (.18)
7 School Subjects	.21 (.24)	.24 (.21)	.28 (.27)	-.15 (-.04)	-.04 (.05)	-.11 (.02)	.03 (.13)	.10 (.16)	.09 (.17)	.23 (.21)
Total Academic (5 + 6 + 7)	.30 (.28)	.29 (.23)	.36 (.31)	-.12 (-.03)	.00 (.08)	-.06 (.04)	.11 (.15)	.17 (.19)	.17 (.21)	.28 (.24)
IAR Scale Reliabilities (number of items)	.32 (8)	.46 (9)	.54 (17)	.39 (7)	.54 (10)	.62 (17)	.37 (15)	.55 (19)	.63 (34)	.40 (34)

NOTE: Correlations are based upon factor scores derived from student ratings of self-concept and the adjusted teacher ratings of students' self concept. Correlations greater than .08 are statistically significant (p .05). The reliabilities of the IAR scale are coefficient alphas (See Nie, et al., 1981).

TABLE 4

Correlations Relating Student Background Characteristics to Students' Self Concept and to Teacher Ratings of Students' Self Concept (values in parentheses)

Self-Concept Dimensions	Sex (1=Female, 2=Male)	Age	School Year	Objective Reading Score
1 Physical Ability	-.34 (-.24)	.05 (-.02)	-.03 (-.03)	-.08 (.10)
2 Appearance	-.12 (-.05)	.08 (-.04)	-.01 (-.02)	-.14 (.02)
3 Peer Relations	-.07 (-.07)	.06 (-.02)	.05 (.05)	-.06 (.17)
4 Parent Relations	.08 (.08)	-.07 (-.11)	-.08) (-.09)	-.04 (.13)
5 Reading	.26 (.21)	-.07 (-.13)	-.03 (-.03)	.22 (.43)
6 Mathematics	-.17 (-.10)	.00 (-.04	-.03 (-.03)	.15 (.34)
7 School Subjects	.10 (.06)	-.07 (-.08)	-.03 (-.03)	.18 (.41)

NOTE: Correlations are based upon factor scores derived from student ratings of self-concept and adjusted teacher ratings of student self-concept. Correlations greater than .08 are statistically significant (p .05).

APPENDIX I -- The Original Version Of The SDQ Used In This Study

SELF DESCRIPTION QUESTIONNAIRE

Pupil's Name _____ Boy ____ Girl ____ Grade _____

School _____ Teacher _____

This is a chance for you to look at yourself and decide what are some of your strong points and weak points. This is not a test and everyone will have different answers – so be sure that your answers show how you think about yourself.

Please do NOT talk about your answers with anyone else. We will keep your answers private and not show them to anyone else.

Read each of the sentences (or read along with me if they are read aloud) and decide the best answer for each one. Find the answer at the top that fits best and put an X in the space under that answer. Before you start, look at the examples that are below.

	FALSE	MOSTLY FALSE	SOMETIMES FALSE SOMETIMES TRUE	MOSTLY TRUE	TRUE
EXAMPLES					
I like to read comic books. (First you must decide whether this statement is true or false or somewhere in between. Suppose, for example, that you really like to read comic books. You should mark "TRUE" by putting an X in the last space)					X
I watch a lot of T.V. (First you must decide whether this statement is true or false or somewhere in between. For example, if you only watch a little bit of T.V. you should mark "MOSTLY FALSE" by putting an X in the second space)		X			
I am neat and tidy. (Suppose you are not neat and tidy, but you are not very messy either. You should mark the response "SOMETIMES FALSE SOMETIMES TRUE" by putting an X in the middle space)			X		

If you want to change an answer cross out the X and put an X in another space on the same line.

If you have any questions, hold up your hand. Otherwise, please turn the page and begin.

	FALSE	MOSTLY FALSE	SOME-TIMES FALSE SOME-TIMES TRUE	MOSTLY TRUE	TRUE
1. I am good looking					
2. I'm good at ALL SCHOOL SUBJECTS					
3. I can run fast					
4. I get good marks in READING					
5. My parents understand me					
6. I hate MATHS					
7. I have lots of friends					
8. I like the way I look					
9. I enjoy doing work for ALL SCHOOL SUBJECTS					
10. I like to run and play hard					
11. I like READING					
12. My parents push me too much					
13. I enjoy doing work for MATHS					
14. I make friends easily					
15. I have a pleasant looking face					
16. I get good marks in ALL SCHOOL SUBJECTS					
17. I try to avoid sports and games					
18. I look forward to READING					
19. I like my parents					
20. I look forward to MATHS					
21. Most kids have more friends than I do					
22. I am an attractive person					

	FALSE	MOSTLY FALSE	SOME-TIMES FALSE SOME-TIMES TRUE	MOSTLY TRUE	TRUE
23. I am dumb in ALL SCHOOL SUBJECTS					
24. I enjoy sports and games					
25. I am interested in READING					
26. My parents like me					
27. I get good marks in MATHS					
28. I get along with other kids easily					
29. I am too fat or too skinny					
30. I learn things quickly in ALL SCHOOL SUBJECTS					
31. My body is strong and powerful					
32. I am dumb at READING					
33. If I have children of my own I want to bring them up like my parents raised me					
34. I am interested in MATHS					
35. I am easy to like					
36. Other kids think I am good looking					
37. Work in ALL SCHOOL SUBJECTS is easy for me					
38. I am good at sports					
39. I enjoy doing work for READING					
40. My parents and I spend a lot of time together					
41. I learn things quickly in MATHS					
42. Other kids want me to be their friend					
43. I have a good looking body					
44. I hate ALL SCHOOL SUBJECTS					

	FALSE	MOSTLY FALSE	SOME-TIMES FALSE SOME-TIMES TRUE	MOSTLY TRUE	TRUE
45. I'm good at aiming at targets					
46. Work in READING is easy for me					
47. My parents are easy to talk to					
48. I like MATHS					
49. I want to have lots of friends					
50. I'm better looking than most of my friends					
51. I am interested in ALL SCHOOL SUBJECTS					
52. I am a good athlete					
53. I'm good at READING					
54. I get along well with my parents					
55. I'm good at MATHS					
56. I am popular with kids of my own age					
57. I have nice features (for example, nose and eyes)					
58. I look forward to ALL SCHOOL SUBJECTS					
59. I'm good at throwing a ball					
60. I hate READING					
61. My parents and I have a lot of fun together					
62. Work in MATHS is easy for me					
63. Most other kids like me					
64. I like ALL SCHOOL SUBJECTS					
65. I learn things quickly in READING					
66. I am dumb at MATHS					

APPENDIX II -- The Revised Version Of The SDQ (revsions based upon this study)

SELF DESCRIPTION QUESTIONNAIRE

Name.....Boy.....Girl.....Grade/Year.....

Age.....School.....Teacher.....

This is a chance to look at yourself. It is not a test. There are no right answers and everyone will have different answers. Be sure that your answers show how you feel about yourself. PLEASE DO NOT TALK ABOUT YOUR ANSWERS WITH ANYONE ELSE. We will keep your answers private and not show them to anyone.

When you are ready to begin, please read each sentence and decide your answer. (you may read quietly to yourself as I read aloud.) There are five possible answers for each question -- "True", "False", and three answers in between. There are five boxes next to each sentence, one for each of the answers. The answers are written at the top of the boxes. Choose your answers to a sentence and put a tick (✓) in the box under the answer you choose. DO NOT say your answer out loud or talk about it with anyone esle.

Before you start there are three examples below. Somebody named Bob has already answered two of these sentences to show you how to do it. In the third one you must choose your own answer and put in your own tick (✓).

		FALSE	MOSTLY FALSE	SOMETIMES FALSE, SOMETIMES TRUE	MOSTLY TRUE	TRUE	
EXAMPLES							
1.	I like to read comic books.....	1	☐	☐	☐	☐	☑ 1
2.	In general, I am neat and tidy.....	2	☐	☐	☑	☐	☐ 2
3.	I like to watch T.V.	3	☐	☐	☐	☐	☐ 3

(Bob put a tick in the box under the answer "TRUE". This means that he really likes to read comic books. If Bob did not like to read comic books very much, he would have answered "FALSE" or "MOSTLY FALSE".)

(Bob answered "SOMETIMES FALSE, SOMETIMES TRUE" because he is not very neat, but he is not very messy either.)

(For this sentence you have to choose the answer that is best for you. First you must decide if the sentence is "TRUE" or "FALSE" or somewhere in between. If you really like to watch T.V. a lot you would answer "TRUE" by putting a tick in the last box. If you hate watching T.V. you would answer "FALSE" by putting a tick in the first box. If your answer is somewhere in between then you would choose one of the other three boxes.)

	FALSE	MOSTLY FALSE	SOMETIMES FALSE, SOMETIMES TRUE	MOSTLY TRUE	TRUE	
EXAMPLES						
1. I like to read comic books..... 1	☐	☐	☐	☐	☑	1
2. In general, I am neat and tidy..... 2	☐	☐	☑	☐	☐	2
3. I like to watch T.V. 3	☐	☐	☐	☐	☐	3

(Bob put a tick in the box under the answer "TRUE". This means that he really likes to read comic books. If Bob did not like to read comic books very much, he would have answered "FALSE" or "MOSTLY FALSE".)

(Bob answered "SOMETIMES FALSE, SOMETIMES TRUE" because he is not very neat, but he is not very messy either.)

(For this sentence you have to choose the answer that is best for you. First you must decide if the sentence is "TRUE" or "FALSE" or somewhere in between. If you really like to watch T.V. a lot you would answer "TRUE" by putting a tick in the last box. If you hate watching T.V. you would answer "FALSE" by putting a tick in the first box. If your answer is somewhere in between then you would choose one of the other three boxes.)

If you want to change an answer you have marked you should cross out the tick and put a new tick in another box on the same line. For all the sentences be sure that your tick is on the same line as the sentence you are answering. You should have one answer and only one answer for each sentence. Do not leave out any of the sentences.

If you have any questions put up your hand. Turn over the page and begin. Once you have started, **PLEASE DO NOT TALK.**

		FALSE	MOSTLY FALSE	SOME-TIMES FALSE, SOME-TIMES TRUE	MOSTLY TRUE	TRUE	
1. I am good looking	1	☐	☐	☐	☐	☐	1
2. I'm good at all **SCHOOL SUBJECTS**	2	☐	☐	☐	☐	☐	2
3. I can run fast	3	☐	☐	☐	☐	☐	3
4. I get good marks in **READING**	4	☐	☐	☐	☐	☐	4
5. My parents understand me	5	☐	☐	☐	☐	☐	5
6. I hate **MATHEMATICS**	6	☐	☐	☐	☐	☐	6
7. I have lots of friends	7	☐	☐	☐	☐	☐	7
8. I like the way I look	8	☐	☐	☐	☐	☐	8
9. I enjoy doing work in all **SCHOOL SUBJECTS**	9	☐	☐	☐	☐	☐	9
10. I like to run and play hard	10	☐	☐	☐	☐	☐	10
11. I like **READING**	11	☐	☐	☐	☐	☐	11
12. My parents are usually unhappy or disappointed with what I do	12	☐	☐	☐	☐	☐	12
13. Work in **MATHEMATICS** is easy for me	13	☐	☐	☐	☐	☐	13
14. I make friends easily	14	☐	☐	☐	☐	☐	14
15. I have a pleasant looking face	15	☐	☐	☐	☐	☐	15
16. I get good marks in all **SCHOOL SUBJECTS**	16	☐	☐	☐	☐	☐	16
17. I hate sports and games	17	☐	☐	☐	☐	☐	17
18. I'm good at **READING**	18	☐	☐	☐	☐	☐	18
19. I like my parents	19	☐	☐	☐	☐	☐	19

8. I like the way I look ..... 8  8

9. I enjoy doing work in all SCHOOL SUBJECTS .... 9  9

10. I like to run and play hard ..... 10  10

11. I like READING ..... 11  11

12. My parents are usually unhappy or disappointed with what I do ..... 12  12

13. Work in MATHEMATICS is easy for me ..... 13  13

14. I make friends easily ..... 14  14

15. I have a pleasant looking face ..... 15  15

16. I get good marks in all SCHOOL SUBJECTS ..... 16  16

17. I hate sports and games ..... 17  17

18. I'm good at READING ..... 18  18

19. I like my parents ..... 19  19

20. I look forward to MATHEMATICS ..... 20  20

21. Most kids have more friends than I do ..... 21  21

22. I am a nice looking person ..... 22  22

23. I hate all SCHOOL SUBJECTS ..... 23  23

24. I enjoy sports and games ..... 24  24

		FALSE	MOSTLY FALSE	SOMETIMES FALSE, SOMETIMES TRUE	MOSTLY TRUE	TRUE	
25. I am interested in READING	25	☐	☐	☐	☐	☐	25
26. My parents like me	26	☐	☐	☐	☐	☐	26
27. I get good marks in MATHEMATICS	27	☐	☐	☐	☐	☐	27
28. I get along with other kids easily	28	☐	☐	☐	☐	☐	28
29. I do lots of important things	29	☐	☐	☐	☐	☐	29
30. I am ugly	30	☐	☐	☐	☐	☐	30
31. I learn things quickly in all SCHOOL SUBJECTS	31	☐	☐	☐	☐	☐	31
32. I have good muscles	32	☐	☐	☐	☐	☐	32
33. I am dumb at READING	33	☐	☐	☐	☐	☐	33
34. If I have children of my own I want to bring them up like my parents raised me	34	☐	☐	☐	☐	☐	34
35. I am interested in MATHEMATICS	35	☐	☐	☐	☐	☐	35
36. I am easy to like	36	☐	☐	☐	☐	☐	36
37. Overall I am no-good	37	☐	☐	☐	☐	☐	37
38. Other kids think I am good looking	38	☐	☐	☐	☐	☐	38
39. I am interested in all SCHOOL SUBJECTS	39	☐	☐	☐	☐	☐	39
40. I am good at sports	40	☐	☐	☐	☐	☐	40
41. I enjoy doing work in READING	41	☐	☐	☐	☐	☐	41
42. My parents and I spend a lot of time together	42	☐	☐	☐	☐	☐	42
43. I learn things quickly in MATHEMATICS	43	☐	☐	☐	☐	☐	43
44. Other kids want me to be their friend	44	☐	☐	☐	☐	☐	44

34. If I have children of my own I want to bring them up like my parents raised me ..... 34  34

35. I am interested in MATHEMATICS ..... 35  35

36. I am easy to like ..... 36  36

37. Overall I am no-good ..... 37  37

38. Other kids think I am good looking ..... 38  38

39. I am interested in all SCHOOL SUBJECTS ..... 39  39

40. I am good at sports ..... 40  40

41. I enjoy doing work in READING ..... 41  41

42. My parents and I spend a lot of time together ..... 42  42

43. I learn things quickly in MATHEMATICS ..... 43  43

44. Other kids want me to be their friend ..... 44  44

45. In general I like being the way I am ..... 45  45

46. I have a good looking body ..... 46  46

47. I am dumb in all SCHOOL SUBJECTS ..... 47  47

48. I can run a long way without stopping ..... 48  48

		FALSE	MOSTLY FALSE	SOMETIMES FALSE, SOMETIMES TRUE	MOSTLY TRUE	TRUE	
49.	Work in READING is easy for me						49
50.	My parents are easy to talk to						50
51.	I like MATHEMATICS						51
52.	I have more friends than most other kids						52
53.	Overall I have a lot to be proud of						53
54.	I'm better looking than most of my friends						54
55.	I look forward to all SCHOOL SUBJECTS						55
56.	I am a good athlete						56
57.	I look forward to READING						57
58.	I get along well with my parents						58
59.	I'm good at MATHEMATICS						59
60.	I am popular with kids of my own age						60
61.	I hate myself						61
62.	I have nice features like nose, and eyes, and hair						62
63.	Work in all SCHOOL SUBJECTS is easy for me						63
64.	I'm good at throwing a ball						64
65.	I hate READING						65
66.	My parents and I have a lot of fun together						66
67.	I enjoy doing work in MATHEMATICS						67
68.	Most other kids like me						68

58. I get along well with my parents 58 58

59. I'm good at MATHEMATICS 59 59

60. I am popular with kids of my own age 60 60

61. I hate myself 61 61

62. I have nice features like nose, and eyes, and hair .. 62 62

63. Work in all SCHOOL SUBJECTS is easy for me ... 63 63

64. I'm good at throwing a ball 64 64

65. I hate READING 65 65

66. My parents and I have a lot of fun together 66 66

67. I enjoy doing work in MATHEMATICS 67 67

68. Most other kids like me 68 68

69. Overall I am good at things I like to do 69 69

70. I like all SCHOOL SUBJECTS 70 70

71. I learn things quickly in READING 71 71

72. I am dumb at MATHEMATICS 72 72