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Self-Concept: Its Multifaceted, Hierarchical Structure

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The construct, self-concept, has been evoked to explain overt behavior across a wide spectrum of situations, and the attainment of a positive self-concept has been posited as a desirable goal in personality and child development, in clinical treatments, and in education. Its importance notwithstanding, research and evaluations using self-concept have suffered from imprecise theoretical formulation of the construct and inadequate measurement instruments. In an attempt to remedy this situation, Shavelson, Hubner, and Stanton (1976) posited a multifaceted, hierarchical self-concept with facets becoming more distinct with age, and set forth criteria for evaluating adequate instrumentation. This paper brings together recent research on this model and instrumentation. Each of these hypotheses is supported, though the structure appears to be more complicated than originally proposed and the facets are so distinct by late adolescence that the hierarchy is necessarily very weak. Further empirical research and theoretical clarification are required on the nature of this hierarchy and how it relates to the different uses of the general-self construct.

Shavelson, Hubner, and Stanton (1976) posited a multifaceted, hierarchical model of self-concept (see Figure 1). This paper brings recent research to bear on properties of this proposed conception of self-concept and instruments used to measure the construct. We focus on the internal characteristics of self-concept—its facets and their organization—reasoning that the identification of theoretically consistent and distinct facets of self-concept and their structure is, at least initially, prerequisite to the study of how self-concept is related to other constructs.

Definition of Self-Concept

Self-concept, broadly defined, is a person's perceptions of him- or herself. These perceptions are formed through experience with and interpretations of one's environment. They are influenced especially by evaluations by significant others, reinforcements, and attributions for one's own behavior (Shavelson, Hubner, & Stanton, 1976). In the model, self-concept is further defined as follows:

1. It is multifaceted in that people categorize the vast amount of information they have about themselves and relate these categories to one another. The specific facets reflect the category system adopted by a particular individual and/or shared by a group.
2. It is hierarchically organized, with perceptions of behavior at the base moving to inferences about self in subareas (e.g., academic—English, science, history, mathematics), then to inferences about self in general.
3. General self-concept is stable, but as one descends the hierarchy, self-concept becomes increasingly situation specific and as a consequence less stable.
4. Self-concept becomes increasingly multi-

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faceted as the individual moves from infancy to adulthood.

5. It has both a descriptive and an evaluative dimension such that individuals may describe themselves ("I am happy") and evaluate themselves ("I do well in mathematics").
6. It can be differentiated from other constructs such as academic achievement.

One possible representation of this hierarchical model is shown in Figure 1. This model posits a structure of self-concept that resembles British psychologists' hierarchical model of intellectual abilities (cf. Vernon, 1950) where general self-concept (like Spearman's "g") is at the apex, and general self-concept can be divided into two components, and these into group and specific factors.

The Hierarchical, Multifaceted Nature of Self-Concept

The self-concept facets proposed in Figure 1, as well as their hypothesized structure, were heuristic and plausible, but they were not empirically validated by Shavelson et al. (1976). Rather, in a review of literature on five commonly used instruments, modest support for the separation of self-concept into social, physical, and academic components was found. However, these three facets were not identified clearly in any one of the instruments. Particularly at the time the model was proposed, not even the multifaceted nature of self-concept was widely accepted.

Some researchers (e.g., Coopersmith, 1967; Marx & Winne, 1978) argued that the facets of self-concept were so heavily dominated by a general factor that they could not be adequately differentiated. Coopersmith, on the basis of preliminary research with his self-esteem inventory, argued that "preadolescent children make little distinction about their worthiness in different areas of experience or, if such distinctions are made, they are made within the context of the over-all, general appraisal of worthiness that children have already made" (p. 6). However, factor analyses of responses to the Coopersmith instrument reveal multiple factors, although these factors are not readily interpretable and bear little resemblance to those the instrument was designed to measure (Dyer, 1964; Marsh & Smith, 1982). Marx and Winne (1978) classified the scales from three commonly used self-concept instruments into the academic, social, and physical facets supported by

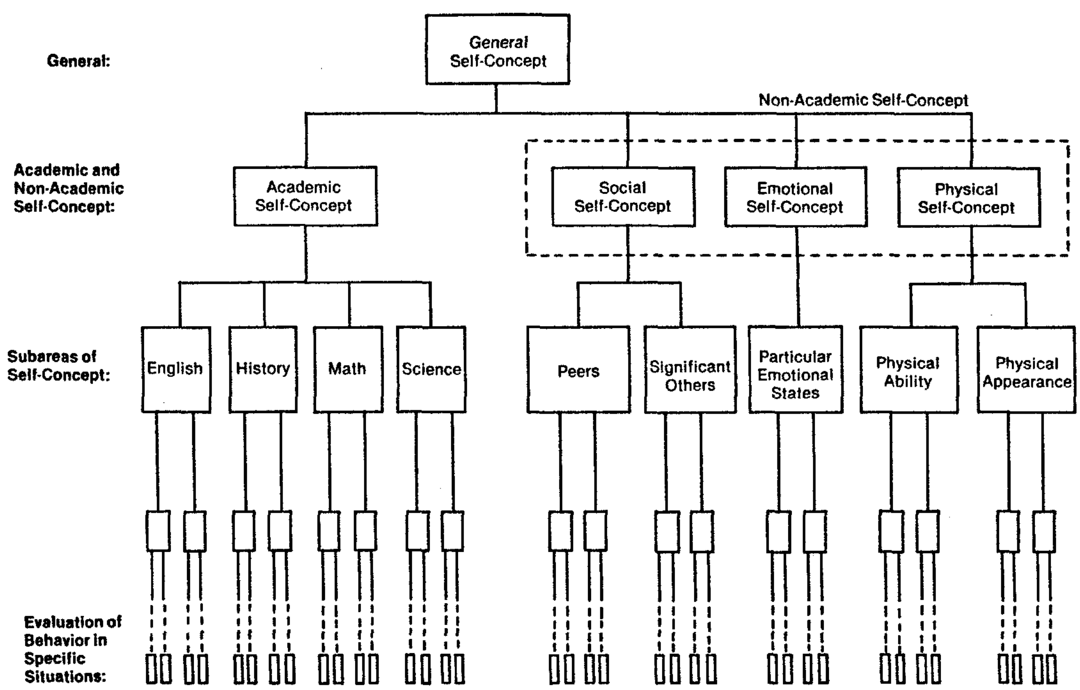

Figure 1. Structure of self-concept (Shavelson, Hubner, & Stanton, 1976).

Shavelson et al. (1976) and compared responses from different instruments. They found that responses to each of the three facets demonstrated some agreement across instruments (convergence), but responses to the different scales could not be adequately differentiated (divergence). This led them to conclude that "self-concept seems more of a unitary concept than one broken into distinct subparts or facets" (p. 900). Shavelson and Bolus (1982) argued that there was insufficient justification for the classification of subscales into facets and reanalyzed the data by taking a single scale from each instrument to represent each of the three facets. By selecting scales that maximized the convergent validities, they were able to demonstrate modest divergent validity.

Most studies that have systematically examined the multidimensionality of self-concept have found support for this multifaceted interpretation (e.g., Boersma & Chapman, 1979; Dusek & Flaherty, 1981; Fernandes, Michaels, & Smith, 1978; Fleming & Courtney, 1984; Fleming & Watts, 1980; Harter, 1982; Kokenes, 1974; Marsh, Parker, & Smith, 1983; Marsh, Relich, & Smith, 1983; Marsh, Smith, & Barnes, 1983; Michaels, Smith, & Michaels, 1975; Piers & Harris, 1964; Shavelson & Bolus, 1982; Shepard, 1979; Wylie, 1979). Nevertheless, factor analyses of the most commonly used self-concept instruments typically fail to identify the scales that the instrument was designed to measure (cf. Marsh & Smith, 1982; Shavelson et al., 1976).

Soares and Soares's (1977, 1982) conceptualization of self-concept is similar to Shavelson's. However, they argued that the low correlations among different areas of self-concept suggest a model of nearly independent facets.

Although the multifaceted nature of self-concept is generally—but not universally—accepted, there is less agreement on the specific facets and how they are structured. The purpose of this paper is to present research designed to test assumptions underlying the conceptual structure of self-concept just described.

The Shavelson–Bolus Study

Shavelson and Bolus (1982) examined the multifaceted, hierarchical structure of academic self-concept. They compared a structure having only general self-concept underlying all of the observed self-concept measurements with alternative structures that posited several distinguishable but correlated dimensions of self-concept. For example, the single facet (general self-concept) model was tested against the five-facet model of academic self-concept shown in Figure 2.

Participating was a sample of 99 seventh- and eighth-grade boys (n = 50) and girls (n = 49) from an intermediate school located in a predominantly white, upper middle-class, suburban community outside greater Los Angeles. The students received a battery of self-concept tests during a 50-minute class session in February 1980 and again in June 1980. General self-concept (GSC) was measured by the Piers–Harris "Way I Feel about Myself" scale (WIFM; Piers & Harris, 1964; also see Bentler, 1972a)

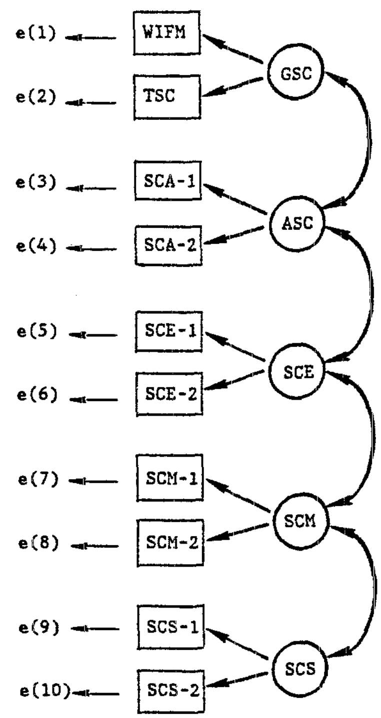

Figure 2. Model of the structure of self-concept based on Figure 1. (All proposed correlations among constructs—curved arrows—have not been drawn to permit clarity. GSC = general self-concept measured by the Way I Feel About Myself scale and the Tennessee Self-Concept Scale; ASC = academic self-concept measured by Self-Concept of Ability scale halves 1 and 2; SCE = self-concept in English measured by Self-Concept of Ability in English scale halves 1 and 2; SCM = self-concept in math measured by Self-Concept of Ability in Math scale halves 1 and 2; SCS = Self-Concept in Science scale halves 1 and 2.)

and the "Tennessee Self-Concept Scale" (TSC; Fitts, 1965; also see Bentler, 1972b). The Michigan State Self-Concept of Ability scale (Brookover, Erikson, & Joiner, 1967) measured self-concept of general academic ability (SCA) and self-concept of ability in specific subject-matter areas (English–SCE, science–SCS, and mathematics–SCM). Items designed to measure each of these four components were divided into two halves in order to obtain parallel composites (see Figure 2).

An analysis of the covariance structure of the data, using LISREL IV (Joreskog & Sorbom, 1978), was conducted to examine the multifaceted, hierarchical structure. The boxes in Figure 2 represent the observed measurements, the circles represent the unobserved constructs underlying the measurements, and the e's represent residuals that are estimated in the data analysis. The straight arrows indicate that the underlying facets (constructs) give rise to the performance observed on the measurements and the relations between the measurement and the facet is estimated in a manner akin to estimating factor loadings. In Figure 2, for example, each observed measurement is expected to load on only one facet of self-concept (all other possible loadings for a particular measurement are constrained to zero). The curved arrows indicate that the facets of self-concept are correlated; these correlations are estimated in the data analysis. A nested set of models was examined: (0) a "null" model of complete independence of all observed measurements–this provides a measure of the total covariation in the data; (1) a single-facet, general self-concept model; (2) a two-facet, general and academic self-concept model; and (3) a five-facet model as shown in Figure 2.

The results of fitting each of the four models to the data collected in February and again in June are presented in Table 1. Before interpreting the findings, a word about the methods used to evaluate the alternative models is warranted. Covariance structure analysis traditionally has relied on a chi-square significance test to determine the extent to which a proposed model fits the observed data. However, as Bentler and Bonett (1980) have pointed out, chi-square goodness-of-fit tests often are inadequate because they are contingent upon the size of the model being tested and the sample size. One alternative has been to express the adequacy of fit as a ratio of chi-square to degrees of freedom, and this is the goodness-of-fit indicator used here for evaluating alternative models (see Bentler & Bonett, 1980).

We interpret the data in Table 1 to mean that the hierarchical, multifaceted model (Model 3) shown in Figure 2 provides the best fit to the data at Time 1 and this finding was replicated at Time 2. Each indicator of goodness-of-fit shows that Model 3 is better than Model 2, and that Model 2 is better than Model 1. Tests of statistical significance, although not discussed, showed that the differences between each of these models are each significant ($p < .001$).

The correlations among the self-concept facets of Model 3 are presented in Table 2. They may be interpreted as supporting a hierarchical structure in the data. That is, a hierarchical structure should produce a pattern of correlations such that GSC correlates highest with academic self-concept (ASC), and next highest with subject-matter self-concepts. Note, however, that the relationships among the subject-matter facets are not of equal magnitude. As might be expected, the mathematics and science facets correlate higher with each other (0.58) than with the English facets (0.33 and 0.38, respectively). In fact, these correlations with the English facet differ little from those with the general facet (0.34 and 0.30, respectively). This suggests that the academic facet of self-concept might be divided into subareas (math and science vs. English), a possibility not entertained by Shavelson et al. (1976, see Figure

Table 1
Test of the Assumption of a Hierarchical, Multifaceted Structure of Self-Concept

Competing Models	Time 1			Time 2		
	χ^2	*df*	χ^2/df	χ^2	*df*	χ^2/df
0. Null Model	718.84	45	15.97	791.54	45	17.58
1. General Self-Concept	354.42	35	10.10	352.90	35	10.08
2. General and Academic	272.50	34	8.01	272.90	34	8.02
3. General, Academic, and Subject-Matter	98.80	25	3.95	116.40	25	4.65

Table 2
Intercorrelations Among Latent Self-Concept Facets Time 1

Measure	GSC	SCA	SCE	SCM	SCS
GSC	–	.48	.26	.34	.30
SCA		–	.52	.62	.73
SCE			–	.33	.38
SCM				–	.58

1). Studies reported in the remainder of this paper shed light on this possibility.

In summary, the Shavelson–Bolus study provided evidence for a multifaceted, hierarchical interpretation of academic self-concept. The study, however, does not bear on nonacademic aspects of self-concept. Nor does it bear on the development of self-concept. For this we turn to more recent studies.

The Structure of Self-Concept: A Preadolescent Developmental Study

The model of self-concept (Figure 1) posits that self-concept is multifaceted, hierarchically ordered, and becomes more distinct with age. These assumptions were tested with 662 respondents to the Self-Description Questionnaire (SDQ) in Grades 2 to 5 (for methodological details see Marsh, Barnes, Cairns, & Tidman, 1984; Marsh & Hocevar, in press). More specifically, this analysis examines the first-order factor structures underlying responses to items on the SDQ at each grade level separately, and the consistency of this structure across grade levels. It also examines the hierarchical structure of these first-order factors. Based upon previous research with the SDQ and the self-concept model, we expect to:

1. identify seven factors corresponding to the facets of Physical Appearance, Physical Abilities, Peer Relations, Parent Relations, Reading, Mathematics, and School Subjects at each grade level;
2. find that the factor loadings are similar at each grade level;
3. show that the size of correlations among the facets (factors) become smaller with age;
4. identify the hierarchical structure among the facets.

In examining the data from the SDQ, four item-pairs were formed from the eight items designed to measure each of the seven facets of self-concept on which the SDQ is based. Responses to these 28 item-pairs were factor analyzed separately at each grade level with conventional (exploratory) factor analysis procedures (Statistical Package for the Social Sciences, SPSS; see Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). The seven factors were identified at each of the four grade levels. For each item-pair, factor loadings were consistently high on the self-concept factor it was designed to measure, and low on other factors (see Marsh, Barnes, Cairns, & Tidman, 1984). the factors were particularly well defined for Grades 4 and 5, while the separation among the academic factors was less clear for Grades 2 and 3. The pattern of correlations among the seven oblique factors offers support for other hypotheses from the self-concept model. At each grade level, the highest correlations tend to occur between the General-School factor and the other academic dimensions, and among the nonacademic dimensions. Despite the similarity in this pattern of correlations, there was a consistent decline with age in the size of correlations among the facets. The median correlations among the factors decrease with increasing grade level (0.27, 0.19, 0.18, and 0.14 in Grades 2–5) despite the fact that the reliabilities (coefficient alpha) for the measurement factors were somewhat higher for the older children. Taken together, these findings appear to support the assumptions of a multifaceted, hierarchical self-concept and the validity of interpretations based upon the SDQ.

The foregoing analyses were based on a conventional factor analysis that is not entirely suitable for testing the model's assumptions. A particular structure cannot be statistically tested against alternative structures and the structure of the model cannot be controlled (beyond setting the number of factors, and perhaps their level of correlation). Moreover, there is no way to examine the structure of first-order and second-order factors (i.e., the hierarchical ordering of facets) within the same analysis. These limitations, however, were to be overcome with confirmatory factor analysis (CFA). The results of such analyses, using LISREL V (Jöreskog & Sörbom, 1981), are described below.

First-order factor structures. In the basic CFA model (Model 1), we hypothesized that: (a) responses to the SDQ can be explained by seven factors corresponding to the self-concept facets, (b) each item-pair loads on only the factor corresponding to the facet it is designed to measure, (c) the seven factors are correlated in a pattern following the hierarchical structure of self-concept, and (d) the error/uniqueness terms for the measured variables are uncorrelated.[1] In Model 1, the goodness-of-fit of the seven-factor model was examined for each grade level separately. That is, we did not require any of the parameter estimates (e.g., factor loadings) at each grade level to be invariant across grades. Hence, in Table 3, the ability of Model 1 to fit the data in Grade 2 is summarized by Model 1a, in Grade 3 by Model 1b, and so on. A good fit between model and data was achieved for each grade level (Models 1a–1d) and across the four grade levels (i.e., the sum of chi-squares in Models 1a–1d). These results demonstrate that the factor structure hypothesized on the basis of the self-concept model is supported at each grade level.

The next step (Model 2) was to determine whether the data could be explained by a model that constrains the factor loadings to be the same at each grade level. This constraint defines a much more restrictive structure than Model 1, and normally is considered to be the minimal condition for factorial invariance (see Alwin & Jackson, 1981). The difference in chi-squares between Model 1 and Model 2 is small and not statistically significant. These results provide strong evidence that the multifaceted structure of self-concept is invariant across the four age groups (see footnote 1).

Model 3 restricted both the factor loadings and the relationships among the factors to be the same across the four age levels. The added restriction is one of constant correlations among the factors across grade levels. The goodness-of-fit measures for Model 3 indicate that this model does not fit the data as well as Model 2.

These results support both the SDQ facet structure and the self-concept model (Figure 1) in each of the four age groups. The factors are well defined and correspond to the facets in the model. The factor loadings at each grade level are large, statistically significant, and invariant over grades. The relationships among the factors were not invariant across the grade levels; this finding is consistent with the hypothesis that the facets become more distinct with age.

Higher-order factor structure. The correlations among the factors (corresponding to self-concept facets) differed significantly with grade (age), but no special assumptions about the pattern of correlations were made. However, both the model in Figure 1 and the design of the SDQ assume that there is a systematic hierarchical ordering of the facets of self-concept. The SDQ measures four nonacademic facets and three academic facets of self-concept. Thus, one reasonable hypothesis would be that the seven first-order factors would form two second-order factors, a finding that would be consistent with Figure 1. However, the results of previous research and the correlations among the factors (Marsh, Barnes, Cairns, & Tidman, 1984) suggest several complications for this model. First, the Parents factor is as highly correlated with some of the academic factors as with the nonacademic factors (perhaps this should not be too surprising given the important role parents play in their children's education). Second, although the Math and Reading factors are each substantially correlated with the General-School factor, they are not substantially correlated with each other. These data led us to suggest that the higher order structure of self-concept may be more complicated than previously assumed.

A series of analyses tested the structure proposed in Figure 1 against alternative models. In each of the higher order factor models, the seven SDQ factors were defined as before. However, unlike the previous analyses, the relationships among these factors were explained by a higher (second) order factor structure. That is, the second-order factors are posited to

[1]For purposes of this study, each of the different models was defined with reference indicators where the factor loading for one of the measured variables (item-pairs) designed to measure each factor was set to 1.0, and the diagonal of the factor variance–covariance matrix was free to be estimated. Every model in Table 3 was tested in the correlation metric. The use of the correlation metric is justified in that one purpose is to compare these findings with those obtained with a conventional/exploratory factor analysis that was performed on a correlation matrix, and also because models in the correlation metric are easier to construct and to interpret. For models that do not involve any invariance constraints, the metric is arbitrary and the chi-square values for analyses performed on the covariance matrices are identical to those shown in Table 3. In only 2 of the 26 analyses are the values based upon the covariance matrices different from those reported in Table 3; 2,569 for Model 2, and 2,802 for Model 3. The choice of metric has not been resolved when there are invariance constraints. Logically, hypotheses can be stated in either. However, the LISREL program has been developed to test hypotheses about covariance matrices, and the consequences of performing analyses on correlation matrices when there are invariance constraints is not well understood (see Marsh & Hocevar, in press, for further discussion).

Table 3
The Goodness-of-Fit: Confirmatory Factor Analytic Models

Model	Description	Chi-Square (*df*)	Ratio
	First-Order Factor Models and Invariance Tests		
1.	Basic model with no invariance constraints summed across all four grade levels	2430 (1316)	1.85
1A	Basic model in Grade 2 (n = 174)	689 (329)	2.09
1B	Basic model in Grade 3 (n = 103)	573 (329)	1.74
1C	Basic model in Grade 4 (n = 134)	517 (329)	1.57
1D	Basic model in Grade 5 (n = 251)	651 (329)	1.98
2.	Basic model with factor loadings invariant	2507 (1379)	1.82
Model 1	vs. Model 2	77 (63)	1.13
3.	Basic model with factor variance-covariance matrix invariant	2732 (1463)	1.87
Model 2	vs. Model 3	225 (84)	2.68
	Goodness-of-Fit Indices for Higher Order Models		
4.	One general second-order factor summed across all four grade levels	2862 (1372)	2.09
4A	Model 4 in Grade 2 (n = 174)	799 (343)	2.33
4B	Model 4 in Grade 3 (n = 103)	646 (343)	1.88
4C	Model 4 in Grade 4 (n = 134)	617 (343)	1.80
4D	Model 4 in Grade 5 (n = 251)	799 (343)	2.33
5.	Two second-order factors (4 nonacademic factors on one, 3 academic on other) summed across all four grade levels	2621 (1368)	1.92
5A	Model 5 in Grade 2 (n = 174)	749 (342)	2.19
5B	Model 5 in Grade 3 (n = 103)	634 (342)	1.85
5C	Model 5 in Grade 4 (n = 134)	547 (342)	1.60
5D	Model 5 in Grade 5 (n = 251)	691 (342)	2.02
6.	Two second-order factors (same as Model 5 but with parents on both factors) summed across all four grade levels	2593 (1364)	1.90
6A	Model 6 in Grade 2 (n = 174)	744 (341)	2.18
6B	Model 6 in Grade 3 (n = 103)	620 (341)	1.82
6C	Model 6 in Grade 4 (n = 134)	547 (341)	1.60
6D	Model 6 in Grade 5 (n = 251)	682 (341)	2.00
7.	Three correlated second-order factors summed across all four grade levels	2478 (1348)	1.84
7A	Model 7 in Grade 2 (n = 174)	704 (337)	2.09
7B	Model 7 in Grade 3 (n = 103)	584 (337)	1.73
7C	Model 7 in Grade 4 (n = 134)	532 (337)	1.58
7D	Model 7 in Grade 5 (n = 251)	658 (337)	1.95
Model 4	vs. Model 1 (target model)	432 (56)	7.71
Model 5	vs. Model 1 (target model)	191 (52)	3.67
Model 6	vs. Model 1 (target model)	163 (48)	3.40
Model 7	vs. Model 1 (target model)	48 (32)	1.50

explain the covariation among the first-order factors. This second-order factor model is more parsimonious than the first-order model that contains 21 correlations among all pairs of first-order factors. The goodness-of-fit for the higher order model, however, cannot be better than that for the corresponding first-order model, and would only be as good if the second-order factors completely accounted for all the covariation among the first-order factors. The first-order factor model (i.e., Model 1 described earlier), then, provides a target or optimum fit for the higher order model, and we refer to it as the target model in the remainder of the paper. A higher order model that fits the data (nearly) as well as the target model and uses fewer degrees of freedom will be preferred, whereas any higher order model that does not fit the data nearly as well as the target model will be rejected.

Because the higher order factors are designed to explain these first-order relationships, and the relationships among the first-order factors vary systematically according to grade level, at least the parameter estimates for the second-order factors also must vary according to grade level. For this reason, the higher order factor models (Models 4–7 in Table 3) are tested separately for each grade level (i.e., Model 4a refers to Model 4 applied to Grade 2), and these results are compared with those based upon the target models determined for each grade level.

More specifically, in order to examine the hierarchical structure of self-concept, we tested four competing models. In the first model (Model 4 in Table 3), a single, general self-concept factor attempts to explain the relationships among the seven first-order factors. This model, however, did not provide an adequate fit at any of the grade levels, and was rejected (Table 3). Model 5 proposed two second-order factors—one defined by the four nonacademic factors and one defined by the three academic factors. Model 5 fit the data better than Model 4, but not as well as the target model (Table 3). Model 6 recognized that the Parents factor is related to both academic and nonacademic factors by allowing this factor to load on both second-order factors in Model 5. Models 5 and 6 differ by only one degree of freedom, reflecting this "dual" loading of the Parents factor at each grade level. But the improvement is statistically significant and supports the earlier observations about the Parent factor.

Model 7 incorporates previous research with the SDQ that has shown self-concepts in Reading and Math to be nearly uncorrelated, but each correlated with the General-School facet. As a consequence we posit two second-order, academic factors—Reading/academic and

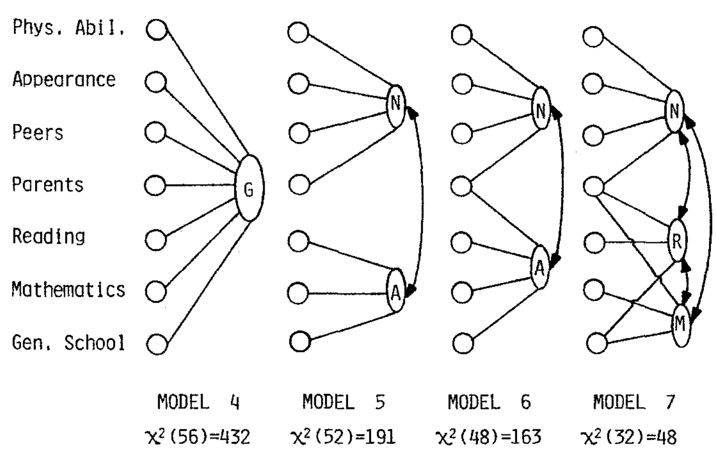

Figure 3. Higher order structures of self-concept in Models 4–7. Each model was compared to Model 1, the target model, and the differences in chi-squares and the degrees of freedom presented for each model provide an indication of its ability explain correlations among the first-order factors (also see Table 3). The higher-order factors proposed in the different models are General (G), Nonacademic (N), Academic (A), Reading/Academic (R), and Math/Academic (M) self-concepts.

Math/academic self-concepts, with the General-School loading on each—and a second-order nonacademic factor. Consistent with the results in Model 6, the Parents factor is allowed to load on each of the two second-order academic factors. In Model 7 we also postulated a correlation among the three second-order factors. This is equivalent to saying that they combine to form a third-order, general self-concept.[2] Model 7 fits the data significantly better than any of the previous second-order models (Models 4–6). In fact, it fits the data nearly as well as the target model at each grade level and for the sum of these models (Model 7 vs. Model 1).

In sum, we proposed four competing models to explain the hierarchical structure of the seven SDQ factors. In separate analyses of data at each grade level, the same model was shown to provide the most accurate description of responses to the SDQ. This model is consistent with Shavelson's assumption that self-concept is hierarchically ordered, but the particular form of this higher order structure is more complicated than previously proposed.

The Structure of Self-Concept: Late Adolescents

Most of the research on self-concept structure is based on data from preadolescents. Does the multifaceted, hierarchical structure posited in Figure 1 and as previously modified hold for adolescents as well? Versions of the SDQ have been developed for both early adolescents (SDQ II) and late adolescents (SDQ III). This section briefly summarizes two studies based upon the SDQ III and explores their implications for the structure of self-concept.

The SDQ III is based upon the model shown in Figure 1 and research done with the SDQ. The initial version of the SDQ III contained items representing the seven factors from the SDQ, except that the Peer scale was divided into Same Sex and Opposite Sex scales. Additional scales were constructed to represent Emotional Stability, Problem Solving/Creative Thinking, and General-Self (similar to the Rosenberg Self-Esteem scale; Rosenberg, 1965). In pilot research, subjects were asked to complete an early version of the SDQ III (which contained 180 items) and to indicate areas important to them that had been excluded from the scale. Preliminary statistical analyses confirmed empirically the conceptual structure of the original 11 scales and the best items were selected for inclusion in the current version of the SDQ III. However, the open-ended responses indicated the need to add scales related to Religion/Spirituality and Honesty/Dependability. Additional items were written to measure these two areas, piloted with a new sample of students, and also included in the current SDQ III.

The Catholic Girls School Study. The first study examined responses from a sample of 296 girls in Grade 11 (mean age = 16.2 years) who attended one of two Catholic senior high schools in Australia. (Details and other aspects of the study, including the wording of the items, appear in Marsh & O'Niell, 1984.) The 10 (or 12) items from each of the 13 scales were combined into item-pairs, and an oblique factor analysis was performed on the total scores for 68 item-pairs. In this conventional factor analysis, each of the 13 SDQ III dimensions emerged with remarkable clarity. The factor loading for every item-pair was high on the factor it was designed to measure and low on other factors. The small correlations (mean $r = 0.09$) among the 13 SDQ III factors (see Table 4) demonstrate that the factors are quite distinct. None of the 78 factor correlations is greater than 0.37 and a majority fail even to reach statistical significance. Surprisingly, not even the General-Self factor is substantially correlated with the other factors. A confirmatory (LISREL) factor analysis, based upon a *simple structure* where each measured variable was allowed to load only on the factor it was designed to measure was also applied to these data and those described in the next section. In each case, the restrictive, simple structure model provided a good fit to the data (see Marsh & O'Niell, 1984). These findings indicate that, although self-concept is multifaceted, the hierarchical structure found in preadolescent self-concept has nearly vanished. Instead, the SDQ III appears to measure relatively distinct facets of self-concept.

[2]It should be noted that while we talk about fitting a third-order model, the third-order factor is in fact "just-identified" (i.e., the three factor loadings required to define the third-order factor use the same number of degrees-of-freedom as do the three correlations among the second-order factors). Consequently, the third-order model cannot be tested against a similar model where the three second-order factors were merely allowed to be correlated (i.e., the chi-square values and the degrees-of-freedom are identical). Because it takes at least three second-order factors to define a third-order factor, third-order factors could not be tested in Models 5 and 6.

Table 4
Exploratory Factor Analyses of Responses to the SDQ III: The Factor Pattern Correlation Matrix

Self-Factors	SDQ III Factors	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
S1	Math	(93)												
S2	Verbal	−04	(86)											
S3	General Academic	24	32	(90)										
S4	Problem Solving	14	37	27	(77)									
S5	Physical Ability	05	−04	−07	09	(95)								
S6	Appearance	00	10	09	11	06	(88)							
S7	Same Sex	00	16	07	13	21	12	(81)						
S8	Opposite Sex	−10	08	−08	19	15	18	34	(93)					
S9	Parents	01	07	20	03	05	09	06	−03	(87)				
S10	Religion	−01	01	18	10	04	−02	03	−09	15	(89)			
S11	Honesty	00	15	24	09	04	00	00	−08	27	11	(75)		
S12	Emotional Stability	03	10	−06	04	10	09	22	18	09	−07	−12	(88)	
S13	General-Self	−03	24	17	26	06	30	34	26	18	16	08	29	(94)

Note. Correlations (presented without decimal points) greater than .12 are statistically significant ($p < .05$). Values in parentheses are coefficient alpha estimates of reliability based on responses to item pairs.

School certificate scores for English and mathematics, representing performance in classes and on a statewide, standardized examination, were also available for each of the students in this study (see Marsh & O'Niell, 1984, for details). The achievement measures were substantially correlated with the academic self-concepts, but not with the nonacademic scales (see Table 5). Particularly for Math and Verbal self-concepts the relationships are strong (Multiple *Rs* = .61 & .46, respectively) and quite specific to the particular subject area. However, although the scores in the two achievement areas are substantially correlated with each other (0.59), Math and Verbal self-concept scores are nearly uncorrelated. Also, in the multiple regressions predicting each of these two self-concepts, the achievement scores have beta weights that are both significant and of the *opposite* sign. Thus, once math achievement is controlled for, English achievement is *negatively* correlated with Math self-concept, and contrawise for Verbal self-concept.

Marsh (Marsh, Parker, & Barnes, in press) observed a similar pattern of relationships between academic self-concept and achievement scores with the SDQ II, and argued for the simultaneous operation of internal and external frames of reference. Consider a student who is below average in both math and English (an external comparison), but who has better math skills than English skills (an internal comparison). Depending on the relative strength of the two processes, this student may have an average or even above-average self-concept in math. The external comparison process will lead to a positive correlation between Verbal and Math self-concepts, the internal comparison process will lead to a negative correlation, and the joint operation of both will lead to small, near-zero correlations that are consistent with empirical findings. Also, the proposal is consistent with the reversal in signs of the beta weights. A high self-concept in math, for example, will result when math skills are strong (external comparison) and when math skills are stronger than verbal skills (internal comparison). However, once the effect of math ability has been controlled for, it is the difference between math and verbal skills that contributes to the prediction of math self-concept. Thus, the sign of the beta weight for verbal skills should be negative. The ability of this proposal to account for these seemingly paradoxical results, both here and elsewhere, make it quite appealing. In addition, it further emphasizes the clear separation of self-concepts in math and verbal areas that has been found in each of the studies in this paper.

Table 5
Correlations Between Self-Concept Scores and Academic Achievement Measures in English and Math

Self-	Correlations		Beta Weights		
Concepts	Math	English	Math	English	Multiple *r*
Math	.58**	.19**	.72**	−.24**	.61**
Verbal	.11	.42**	−.25**	.55**	.46**
Academic	.27**	.24**	.14*	.19**	.29**
Problem Solving	.03	.17**	−.11	.24**	.19**
Physical Ability	.02	−.11	.13	−.19*	.15*
Phsycial Appearance	.05	.02	.06	−.02	.06
Same Sex Peer	−.04	−.01	−.05	.02	.04
Opposite Sex	−.08	−.03	−.10	.04	.09
Parents	−.08	−.12	−.01	−.12	.12
Religion	.00	.00	.01	.00	.01
Honesty	−.08	−.09	−.04	−.07	.09
Emotional	.08	.06	.07	.02	.08
General	.02	.06	−.08	.10	.09

Note. Beta weights are standardized and based on multiple regression where both academic achievement scores were used to predict each of the self-concept scores.
$^*p<.05$. $^{**}p<.01$.

Shavelson et al. (1976) posited increasing differentiation of the self-concept facets with age, but not to the degree of independence found here. This suggests possible problems for the model or with the data reported here (particularly given the highly selective nature of the sample). However, the results of a subsequent study provide further support for these findings.

Self–Other study. In the second study with the SDQ III, students from two Australian universities and one teacher's college were requested to complete the questionnaire and to ask "the person in the world who knew them best" to complete the questionnaire as if he or she were responding as the subject. Thus, the significant other was asked to predict the responses of the person who gave them the questionnaire and had already completed it. Subjects were explicitly instructed not to discuss their responses with their chosen other, not even after both had finished. A stamped envelope was included with the questionnaire given to the significant other, and they were also explicitly instructed not to discuss their responses with the subject.

A total of 151 sets of paired-responses were obtained where both the subject and the significant other completed the survey. Separate conventional factor analyses of both sets of responses identified clearly the 13 SDQ III factors. Confirmatory factor analyses of both sets of responses also demonstrated that the 13-factor solution adequately described the data (see Marsh, Barnes, & Hocevar, in press, for details). Thus, the pattern of factor loadings found before was not only replicated, but it was shown to generalize to the ratings by significant others as well.

Table 6
Multitrait-Multimethod Matrix: 13 SDQ III Factors Rated By Self and By Significant Other (n = 151)

Traits	Self-Concept Factors By Self												
Self-ratings	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
SS1 Math	95												
SS2 Verbal	−03	84											
SS3 General Academic	09	40	86										
SS4 Problem Solving	08	17	30	79									
SS5 Physical Ability	01	−14	−17	−03	96								
SS6 Appearance	07	09	25	15	09	86							
SS7 Same Sex	14	13	16	09	08	16	86						
SS8 Opposite Sex	06	24	03	05	03	11	21	90					
SS9 Parents	05	14	−02	−14	−08	−04	18	16	91				
SS10 Religion	−01	00	−02	−06	02	−08	10	−05	10	95			
SS11 Honesty	00	06	13	−01	02	01	11	13	05	09	74		
SS12 Emotional Stability	03	12	10	05	12	08	27	27	14	−09	07	91	
SS13 General-Self	16	07	12	10	08	14	31	28	08	01	06	28	93
Ratings-by-other	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
O1 Math	(77)	−05	03	03	−08	−06	05	−03	07	05	−09	−06	05
O2 Verbal	−07	(51)	31	12	−19	18	−01	06	22	04	−10	08	−06
O3 General Academic	23	15	(31)	09	−00	07	−04	−13	−02	14	−06	−11	00
O4 Problem Solving	08	20	17	(52)	04	12	−03	−03	−07	−08	−01	18	01
O5 Physical Ability	04	−17	−10	−04	(78)	09	−01	−11	06	08	−01	18	08
O6 Appearance	04	−03	−06	10	06	(50)	05	11	15	07	06	08	19
O7 Same Sex	01	00	−12	−11	03	06	(45)	12	22	09	11	27	31
O8 Opposite Sex	01	−02	20	07	12	00	12	(51)	08	00	−03	30	20
O9 Parents	07	00	−07	−10	02	−08	17	08	(76)	14	01	15	06
O10 Religion	05	−08	00	06	06	−13	04	−08	02	(79)	09	−09	01
O11 Honesty	−07	−05	05	−01	04	00	−04	−02	10	25	(44)	08	−02
O12 Emotional Stable	02	18	−11	03	11	−01	12	23	24	05	00	(62)	12
O13 General-Self	07	−08	−00	15	12	15	21	17	15	09	04	22	(41)

Note. Correlations (presented without decimal points) greater than .19 are statistically significant ($p < .05$).

A multitrait-multimethod matrix (see Table 6) was formed using the 13 factors as traits, and "Self" and "Other" as two different measurement methods. Table 6 presents correlations of factor scores among the 13 Self factors (the upper left triangular submatrix), among the 13 Other factors (the lower right triangular matrix), and correlations between the Self and Other factors (the square matrix). Correlations among the 13 Self factors (median $r = 0.08$) are small and represent approximately the same pattern and magnitude of relationship among the factors as observed in Table 4. Correlations among the 13 Other factors (median $r = 0.14$), though slightly higher, are also modest. Correlations in the diagonal of the square submatrix (values in parentheses) are correlations between Self and Other response to the same factors. These convergent validity coefficients are statistically significant and of meaningful value, ranging from 0.41 to 0.79 (median $r = 0.52$), and substantially higher than the off-diagonal correlations (maximum $r = 0.31$) in this square submatrix.

The results of this second SDQ III study substantially strengthen the conclusions based upon the first study. The clear identification of the SDQ III factors was again found with the self-ratings, and was also demonstrated with responses by significant others. Correlations among the Self factors and among the Other factors are small. Most significantly, the Self-Other agreement is high, demonstrating strong support for the validity of interpretation of the SDQ III dimensions.

Conclusions and Implications

The findings from a number of studies support the hypothesis of a multifaceted structure

Self-Concept Factors By Other												
O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13
O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13
95												
00	86											
22	32	88										
13	37	19	82									
04	00	15	15	97								
02	14	−05	17	20	89							
01	11	−01	02	09	23	90						
00	02	−03	19	16	34	37	90					
11	14	10	−01	15	08	32	09	93				
05	−06	11	03	10	04	−02	−05	08	95			
−01	17	24	15	12	15	15	03	07	27	81		
−04	12	01	19	15	19	32	41	34	−01	08	93	
02	13	11	22	16	41	29	36	21	08	16	33	92

of self-concept. At least for the younger subjects, the structure is clearly hierarchical, but more complex than proposed in Figure 1. The self-concept of Parent Relationships, though not specifically considered in Figure 1 (except as a "Significant Other"), appears to be associated with both academic and nonacademic facets of self-concept. More importantly, there seems to be a clear separation of the verbal and mathematical self-concepts that are distinct and cannot be incorporated into a general academic self-concept.

This separation between Math and Verbal self-concept was also demonstrated in the late-adolescent data, where a model was proposed that might explain why this separation between the two self-concepts is so much stronger than between the corresponding two areas of academic ability. According to this model, students based their academic self-concepts in particular subjects on how their ability in that subject compares with other students (an external comparison) and how their ability in that particular subject compares with their abilities in other subjects (internal comparison). Although there is considerable support for the external process as one basis for the formation of self-concept (e.g., Marsh & Parker, 1984), the internal process also is needed to explain the relative lack of correlation between the two facets of self-concept. Further research is needed to clarify this interpretation and to examine its application to other areas of self-concept.

Another surprising finding is the relative independence among self-concept facets for late adolescents. Shavelson et al. (1976) proposed increasing independence of self-concept facets with age, as was demonstrated with the preadolescent self-concepts. However, near independence was not envisioned, and further research on this point clearly is warranted.

The emphasis of this paper has been on the multifaceted nature of self-concept, and support—both here and elsewhere—is pervasive. However, at least in practice there is still a preponderance of research that describes self-concept with a single score that is called overall, total, or general self-concept. The multifaceted nature of self-concept renders this practice as dubious. Nevertheless, both theoretically and practically, the construct of a general self-concept is important.

Research on self-concept, at least implicitly, uses three different definitions of general self-concept and each definition appears in studies described in this paper. The first, and most common, is a total score across a broad collection of self-report items. Total scores from the Piers–Harris and Tennessee Self-Concept instruments were used for this purpose in the Shavelson–Bolus study. The second use of general self-concept refers to an inferred construct, a higher order factor, that is not directly measured. The general self-concept that appears at the apex of Figure 1 and the general factor in the second-order factor analyses of the SDQ is an example of this use. The third use of general self-concept refers to a separate, distinguishable facet that is viewed as a superordinate dimension, and is sometimes referred to, albeit ambiguously, as self-esteem. The General-Self scale that appears in the SDQ III study (and has also been included in the SDQ II and subsequent versions of the SDQ) is an example of this use.

In practice, the first use of general-self is most common. Here, the construct is vaguely defined and there is little rationale for the potpourri of items that are used to measure it. On many commonly used instruments there is an attempt to measure a diverse set of facets, but the different facets have not been empirically verified, nor their contribution balanced. Instead, responses simply are summed to form a total score that is taken to be a measure of general-self. The construct that is actually measured in such a situation cannot be adequately characterized. For example, Marsh and Smith (1982) compared responses to the Coopersmith Self-Esteem Inventory (1967) and the Sears Self-Concept Inventory (1963). A preliminary inspection of the content of each suggested only a modest overlap in the aspects of self tapped by the two, and so it was not surprising that even total scores from the two instruments correlated only 0.42. In the Shavelson–Bolus study, general-self was measured by the Piers–Harris and the Tennessee Self-Concept, and here there was better agreement ($rs = 0.80$ and 0.73 at Time 1 and Time 2). Nevertheless, we find the first, agglomerate use of general self-concept to be particularly dubious, and suggest that is has led to many of the contradictory findings that abound in self-concept research.

A more justifiable operalization of general-self is either with a weighted combination of self-concept facets or with scales that specifically are designed to measure a relatively unidimensional construct that is superordinate to specific self-concept facets. These two different operalizations of general self-concept may be theoretically similar. In order to respond to the items on the General-Self scale (e.g., "Overall, I have pretty positive feelings about myself") one might assume that, as Shavelson's theory suggests, the subject considers various facets of self-concept and reaches a decision, or the subject keeps a "running tab" on how she feels about herself overall, and responds accordingly. What is unknown is whether this process is simply a sum over facets, a weighted sum depending on the importance of the facet (cf. William James, 1890/1963), or some other more complex process. Or Shavelson's facet model may be incorrect and the formation of general self-concept may take place independently of specific facets of self-concept.

Another aspect of self-concept in need of further clarification is the nature of the hierarchical structure. With the hierarchical ability model that resembles the model in Figure 1, the hierarchical structure is so clearly evident that theorists question whether group and specific factors are necessary. For pre-adolescent self-concepts, there is a clear hierarchy, though the empirically derived structure is more complex than proposed and its strength grows weaker with age when the specific facets become more distinct. So long as there are statistically significant correlations among the first-order factors, an argument for a hierarchy is viable. However, with the late-adolescent data, the hierarchical ordering is so weak that its utility may be dubious (see Gardner, 1983, especially chapter 10).

Self-concept research described here has important implications for developmental psychology (see Harter, 1983 for an extensive review). Apparently, as subjects grow older, levels of self-concept vary, facets of self-concept become more distinct and their hierarchical structure becomes weaker. The implications for the emergence and development of general self-concept is less well understood. Harter (1982) asserted that general self-concept is well defined for children as young as 8 years, but that there is no evidence for general self-concept in the responses of mentally retarded children between the ages of 9 and 12, nor in responses by children between the ages of 4 and 7. This suggests that general-self becomes better defined, and perhaps more important, with age. However, because the hierarchical structure of self-concept becomes weaker with age, it seems that general-self at the apex of that hierarchy becomes weaker, and perhaps less important with age. Hence, not only is there a need for the clarification of the relationship between these two uses of general-self, but this issue also must be examined within a developmental perspective.

Two of the most commonly used criteria for validating the self-concept construct are measures of academic performance (particularly for school-aged subjects) and the observations of an external observer. Literature reviews (e.g., Hansford & Hattie, 1982; Shrauger & Schoeneman, 1979; Wylie, 1974, 1979) suggest that both of these external criteria—as well as many others—show little relationship to self-concept. In contrast to these earlier findings, results based upon these criteria described here provide stronger support for the validity of self-concept. The clear separation of the multiple facets of self-concept is an important reason for this difference. Other research often relies upon an ill-defined total self score or a general-self scale like that in the SDQ III. However, the General-Self scale in the SDQ III was uncorrelated with math or English achievement in the Catholic School Study, and self–other agreement was lower for this scale than any other in the Self–Other Study. Academic achievement and the inferred self-concepts by external observers are both more strongly correlated with specific areas of self-concept than with general self-concept. We suspect that self-concepts in specific areas will provide better prediction of most external criterion than will broad measures of general self-concept, and we contend that the relationship between self-concept and other constructs cannot be adequately understood if the multidimensionality of self-concept is ignored.

Byrne (1984) describes four theoretical models of self-concept: (a) a hierarchical model as described here; (b) self-concept as a unidimensional construct; (c) a model of highly specific, relatively independent factors such as that proposed by Soares and Soares (1982) and called a *taxonomic model* by Byrne; and (d) a compensatory model, derived from research by Winne and Marx (1981), that suggests that specific facets are inversely related such that students who are less successful in one area (e.g., academic achievement) would perceive themselves as more successful in other areas (e.g., physical and social facets). Research described here bears directly on each of these perspectives. We have just discussed the relation between general-self as a superordinate, relatively unidimensional construct and general-self as the apex of a hierarchy. Because there appears to be good support for each, further theoretical and empirical research is needed to relate these two approaches to general self-concept. We see the distinction between the hierarchical approach and the one suggested by Soares and Soares (1982) as one of the strength of the hierarchy rather than the structure of self-concept. Consistent with their findings, we also found a surprising lack of correlation among facets of self-concept in the late-adolescent data. Finally, the compensatory model is similar to the internal comparison process described in the internal/external model that was posited to explain why Reading and Math self-concepts are relatively uncorrelated. Such a finding, although making the hierarchical ordering of self-concept more complicated, is not inconsistent with the present approach, and may offer an explanation as to why different facets of self-concept are not more highly correlated. Hence, we see each of these perspectives as potentially consistent with our hierarchical approach, and further research is needed to determine if these approaches are compatible with one another as well as to clarify the distinctions.

The studies reported here have clarified a number of issues, but have also raised important questions that require further research and theoretical clarification. Each of the studies provided clear support for the multifaceted nature of self-concept. The structure of self-concept and the relationship between self-concept and other constructs cannot be adequately understood if this multidimensionality is ignored. At least with the preadolescent data the structure is clearly hierarchical, though the strength of the hierarchy decreases with age and is more complicated than previously assumed. Different uses of the construct of general-self were identified, but the relationship among these has not been sufficiently clarified. In particular, there is need for research relating the general self that appears at the apex of a hierarchy such as that shown in Figure 1 with the general self resulting from the type of items in the general self scale of the SDQ III. Indeed, as the self-facets become more distinct as in the late-adolescent data, the utility of the hierarchical ordering becomes questionable, even though the General-Self factor is well defined. Clearly, the nature of the hierarchy needs further clarification and research with older subjects.

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