Validity of Nonacademic Facets of Self Description Questionnaire II®

Charles K. C. Leung
Herbert W. Marsh
and Alexander Seesheing Yeung

University of Western Sydney, Macarthur


Abstract

Recent studies on the validity of the Self Description Questionnaire II (SDQII) have shown a distinction between academic and nonacademic facets of self-concept. Most of these studies have focused on the academic facets than the nonacademic facets. For the academic self-concept constructs, the application of advanced confirmatory factor analysis (CFA) has provided particularly strong tests of construct validity. By correlating external criterion variables such as achievement scores and subject selection in specific academic facets to self-concept in corresponding academic facets, the distinctiveness of the self-concept constructs can be more clearly shown. However, few studies have applied a similar approach to testing the validity of nonacademic facets of the SDQII instrument. The present study examined the responses of high school students (N=244) in four nonacademic facets of the SDQII: Same-sex relation, Opposite-sex relation, Parent relation and Honesty-Trustworthiness. CFA found the four distinct factors. When nonacademic external criteria including perceived support from family, perceived support from friends and adoption of avoidance coping strategies were added to the CFA model, the distinctiveness of these four self-concept constructs is clearly demonstrated. Perceived support from family was correlated more highly with Parent relation than with other SDQII factors, perceived support from friends was correlated more highly with Same-sex relation and Opposite-sex relation than with other SDQII factors, whereas adoption of avoidance strategies was correlated more negatively with Honesty-Trustworthiness than with SDQII factors. The inclusion of these nonacademic external criteria has provided a strong evidence of the validity of these four nonacademic scales.

Shavelson, Hubner and Stanton (1976) posited that self-concept is multifaceted instead of unidimensional in nature. Described in the Shavelson model is a general self-concept defined by academic and nonacademic self-concepts. Academic self-concept is further divided into self-concepts in particular content areas whereas nonacademic self-concept is divided into social, physical, and emotional self-concepts. The multidimensionality of self-
concept has been supported by numerous factor analytic studies (e.g., Harter, 1982; Marsh, Barnes, & Hocevar, 1985; Marsh, Parker, & Barnes, 1985) and construct validity reviews (e.g., Byrne, 1984; Marsh & Shavelson, 1985). Hence, recent research of self-concepts has put much emphasis on the multidimensionality and domain-specificity of self-concept. To measure different areas of self-concept for preadolescents, early adolescents and late adolescents, Marsh developed a series of Self Description Questionnaire (SDQ) instruments (e.g. Marsh, 1990a, 1990b, 1992) which was based upon the Shavelson model of self-concept and the multiple dimensions of self-concept proposed in that model.

To test the construct validity of these SDQ instruments, between-network and within-network studies (Marsh, 1990c; Shavelson et al., 1976) have been conducted. Within-network studies explore the multidimensionality of the factor structure of self-concept by using empirical techniques such as factor analysis or multitrait-multimethod (MTMM) approach whereas between-network studies try to examine the logical, theoretically consistent pattern of relations between measures of self-concept and other constructs such as achievement score (Marsh, 1990c). Regarding the within-network studies, numerous exploratory and confirmatory factor analyses have identified the factor structure of these SDQ instruments (e.g., Marsh & O'Neill, 1984; Marsh, Parker, & Barnes, 1985; Marsh, Relich, & Smith, 1983; Marsh & Shavelson, 1985). For the between-network studies, much research has been done on academic self-concepts by employing external criteria such as achievement scores to examine the relations between academic self-concepts and these external criteria. For example, it has been shown that academic achievement was more strongly correlated with academic self-concepts than with nonacademic self-concepts and general components of self-concept (Marsh, 1993a); and self-concepts in particular school subject correlated highly with matching academic course selection (Marsh & Yeung, 1997a). Several studies have applied a similar approach to test the construct validity of nonacademic self-concepts. Two of these studies which used external criteria such as physical fitness indicators in testing the construct validity of physical self-concepts were the Marsh (1996) and the Marsh and Peart (1988) studies. It was found that physical fitness was substantially correlated with physical ability self-concept, modestly correlated with physical appearance self-concept, and unrelated to other areas of self-concept (Marsh & Peart, 1988). However, thus far, existing research has rarely used other external criteria in testing the construct validity of other nonacademic self-concepts such as those in the social domain.

Hence, there is an important need to evaluate the construct validity of these nonacademic self-concept responses by employing nonacademic external criteria. In the present study, the construct validity of four nonacademic SDQII responses including Same-Sex relation, Opposite-sex relation, Parent relation and Honesty-Trustworthiness were tested. Perceived support from family (a family-related external criterion), perceived support from friends (a friend-related external criterion) and avoidance coping strategies (an honesty-trustworthiness-related external criterion) were used as external criteria. In order to further support that these external criteria can validate the corresponding nonacademic self-concepts instead of academic self-concepts, two academic self-concepts -- Math and Verbal -- were included. It was expected that each of the external criteria employed in this study would be substantially correlated with the specific facet of self-concept to which it was most logically related, and less correlated to other areas of self-concept. Specifically, it was hypothesized that perceived support from family would be correlated more highly with Parent relation than with the other SDQII factors, perceived support from friends would be correlated more highly with Same-sex relation and Opposite-sex relation than with the other SDQII factors, whereas avoidance coping strategies would be correlated more negatively with honesty-trustworthiness than with the other SDQII factors.
Method

Participants

The participants were 244 students (199 in Grade 7 and 45 in Grade 11) from two high schools in metropolitan Sydney, New South Wales, Australia. The participants came primarily from working class to middle class families.

SDQII Measures

The SDQII is designed to measure 11 areas of self-concept (see Marsh, Parker, & Barnes, 1985; Marsh, Smith, Owens, & Marsh, 1988). The present study used four nonacademic (Opposite-sex relation, Same-sex relation, Honesty-Trustworthiness, Parent relation) and two academic self-concept scales (Verbal, Math). A total of 56 items were adopted, approximately half of which are negatively worded. They were rated on a 1 ("false") to 6 ("true") response scale.

Social Support Appraisal Scale (SS-A)

The SS-A scale (Vaux, Phillips, Holly, Thomson, Williams & Stewart, 1986) was designed on the basis of Cobb's (1976) concept of social support which is defined as "information leading the participant to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligation" (Cobb, 1976, p.300). This scale was designed to tap the extent to which the individual believes that he or she is loved by, esteemed by, and involved with family, friends, and others. These beliefs constitute the subjective appraisal of information provided by the existence of supportive relationships and the occurrence of supportive interactions. The SS-A consists of three subscales: family, friend and "others". In the present study, only the family and friend subscales were used. The family and friend subscales showed good internal consistency in that the mean Cronbach alpha coefficients for these two scales were .80, and .84 respectively for the student samples, and .81, and .84 respectively for the community samples. The family and friend subscales were moderately associated for both student samples (mean $r$=.51) and community samples (mean $r$=.52), supporting their utility as separate subscales (Vaux et al., 1986).

In the present study, 4 items for family and 7 items for friends were adapted respectively with simplification or rephrasing of wording to suit the understanding of the students (e.g. 'My family values me highly', 'I can rely on my friend'). The items were rated on a 1 ("false") to 6 ("true") response scale.

Coping Strategies Indicator (CSI)

The Coping Strategy Indicator (Amirkhan, 1990) is a self-report measure of the degree to which three types of coping strategies (Problem-Solving, Social Support Seeking and Avoidance) have been used in response to a recent problem in one's life. In the original scale, respondents first explain the stressful events and then rate all items. Hence, the CSI was intended as a situation-specific measure, a measure of an individual's choice among strategies in any one coping episode. However, the instrument is also effective in identifying more generalised, cross-situational coping tendencies (Amirkhan, 1994). Thus, the CSI was used for measuring the general coping strategies in this study. Confirmatory factor analysis revealed three distinct factors: Problem-Solving, Seeking Social Support, and Avoidance (Amirkhan, 1990). In the present study, only the Avoidance subscale which taps the extent to which the individual adopts avoidance approach when facing difficulties or problems was used. Findings revealed that the internal consistency (.84 in a community sample of 92 participants) and test-retest reliability (.82 and .79 in undergraduates and community
samples respectively) of the Avoidance subscale were good. The construct validity of the Avoidance subscale has been demonstrated (Amirkhan, 1990, 1994).

Seven items for this subscale were adapted with simplification or rephrasing of wording to suit the understanding of the participants (e.g., 'I avoid the problem by keeping others from seeing how bad my problem is'). Students responded to each item by rating on a 1 ("never") to 6 ("always") response scale.

Statistical Analyses

Following the common practice of other SDQ research (e.g. Marsh, Craven, & Debus, 1991; Marsh & Yeung, 1997b), item-pair scores on each of the six subscales of the SDQII responses were used for confirmatory factor analysis (CFA). For each subscale, the first 2 items were averaged to form the first item pair, the next 2 items were used to form the second pair, and so forth. This resulted in a total of 28 item-pairs of SDQII responses. Together with 4 items of perceived support from family, 7 items of perceived support from friends and avoidance coping strategies respectively, a 46 x 46 covariance matrix was constructed for CFA. Since the approach of CFA and the use of item pairs have been described elsewhere (e.g., Bollen, 1989; Byrne, 1989; Joreskog & Sorborm, 1993; Marsh & O'Neil, 1984), they are not further described in detail here.

Analyses were conducted with the SPSS version of LISREL (Joreskog et al., 1993) to test the a priori factor structure of the four nonacademic SDQII responses in seven models. The goodness of fit of these models (Table 1) is evaluated based on suggestions of Marsh, Balla, and McDonald (1988) and Marsh, Balla, and Hau (1996) with an emphasis on the Tucker-Lewis index (TLI) but the chi-square test statistic and the relative noncentrality index (RNI) are also reported. A widely applied guideline for a "good" model fit is that TLI and RNI are equal or above .90 (Bentler, 1990; Bentler & Bonett, 1980). The critical parameter measures need to be reasonable and significant factor loadings of each factor and, correlations between SDQ constructs and external criteria should be in predicted directions. Although we hypothesized multiple factors in each a priori model, we also tested single-factor models. The purpose of including single-factor models following corresponding multi-factorial models was to further support the hypothesis that the multifactorial models should fit the data much better than the corresponding single-factor models. These multifactorial models were further tested by including the external criteria described above to examine the pattern of correlations between the four nonacademic self-concepts and the three external criteria.

Results

Preliminary Analysis

Reliability estimates for the four nonacademic (Opposite-sex relation, Same-sex relation, Honesty-Trustworthiness, Parent relation) and two academic self-concept scales (Verbal, Math) are good (alphas = .91, .81, .83, .85, .94 and .87 respectively). Similarly, for the external criteria, reliability estimates for perceived support from family and friends are good (alphas = .80 and .86 respectively) and satisfactory for avoidance coping strategies (alpha = .74).

Seven CFA models were then evaluated and the goodness of fit indices for each model were summarized in Table 1. Since Model 7 included all parameters that were also found in other models, only the complete solution of this model was shown in Table 2.
Model 1: Four Nonacademic SDQII Factors

The first model tested the factor structure of the four nonacademic SDQII responses: Opposite-sex relation, Same-sex relation, Honesty-Trustworthiness and Parent relation. Consistent with previous research, this four-factor model could fit the data (TLI=.940).

Model 2: Single-factor Model for Four Nonacademic SDQII Scales

The second model tested whether the SDQII data were able to be fitted into a single factor. Consistent with previous research, the single-factor model could not fit the SDQII data (TLI=.289). Thus, result of this model provided further support for the multidimensionality of the SDQII responses in Model 1.

Model 3: Two SS-A Factors (Perceived Support From Family and Perceived Support From Friends)

In this model, since the two-factor model could fit the data from perceived support from family and perceived support from friends (TLI=.961), the existence of separate factors for perceived support from family and perceived support from friends was supported.

Model 4: Single-factor Model for two SS-A Scales

This model tested whether the SS-A data were able to be fitted into a single factor. As predicted, the single-factor model could not fit the SS-A data (TLI=.691). Thus, the results of this model provided further support for the existence of separate factors for family and friends of the SS-A responses in Model 3.

Table 1

Goodness of Fit Summary for Alternative Models

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1 factor for AVOIDANCE 25.73 14 .941 .961
6. Null model 4617.77 630

(a) 4 Nonacademic SDQ factors +

3 external criteria

(FAMILY + FRIEND + AVOIDANCE) 947.20 573 .897 .906

(b) 4 Nonacademic SDQ factors +

3 external criteria (FAMILY + FRIEND + AVOIDANCE) + 1 CU 916.07 572 .905 .914

7. Null model 6837.26 1035

4 Nonacademic SDQ factors +

2 Academic SDQ factors +

3 external criteria (FAMILY + FRIEND + AVOIDANCE) + 2 CU 1479.65 951 .901 .910

Note: N = 244. The SDQII factors were four Nonacademic scales (Opposite-sex relation (OSEX), Same-sex relation (SSEX), Honesty-Trustworthiness (HON), Parent relation (PAR)) and two Academic scales ((Verbal(VERB), Math (MATH)) from 28 item pairs. Perceived support from family (FAMILY), perceived support from friends (FRIEND) and avoidance coping strategies (AOVIDANCE) were used as external criteria for assessing construct validity of the SDQII factors. RNI = Relative noncentrality index. TLI = Tucker-Lewis index. CU = correlated uniqueness among items.

Model 5: An Avoidance Factor Of Avoidance Coping Strategies

This model tested whether an Avoidance factor could fit the data from avoidance coping strategies responses. The result showed an Avoidance factor could fit the data (TLI=.941).

Model 6: 4 Nonacademic SDQII Factors With 3 External Criteria

Scores from three external criteria: perceived support from family, perceived support from friends and avoidance coping strategies were added to the four nonacademic SDQII scales in Model 6 to test the validity of the factor structure of these four scales. These four scales were validated by meeting the following conditions: scores from perceived support from family should be more highly correlated with Parent Relation self-concept than with the other three nonacademic self-concept scales; scores from perceived support from friends should be more highly correlated with both Opposite-sex relation and Same-sex relation self-concepts than with the other two nonacademic self-concept scales; scores from avoidance coping strategies should be more negatively correlated with Honesty-Trustworthiness self-concept than with the other three nonacademic self-concept scales. Since Model 6b with one correlated uniqueness provided a better fit to the data than Model 6a without correlated uniqueness, both models, with and without uniqueness, were reported in Table 1. Consistent with prediction, Family was more highly correlated with Parent Relation self-concept ($r=68$) than with the other three nonacademic self-concept scales, Friend was more highly
correlated with both Opposite-sex relation and Same-sex relation self-concepts ($r=.36$ and 
$.53$ respectively) than with the other two nonacademic self-concept scales and, Avoidance 
was more negatively correlated with Honesty-Trustworthiness self-concept ($r=.53$) than with 
the other three nonacademic self-concept scales. The results strongly supported the a priori 
structure in that there are four distinct nonacademic self-concepts each correlated with a 
respective external criterion.

Model 7: 2 Academic and 4 Nonacademic SDQII Factors With 3 External Criteria

To extend previous research in the application of external criteria for between-network 
validation, we further tested whether the three external criteria used in the present study 
were in fact appropriate in testing the corresponding nonacademic self-concepts instead of 
academic self-concepts. Model 7 extends Model 6 by including two Academic self-concept 
scales (Math, Verbal). In this extended model, the validity of using these three external 
criteria for testing the corresponding nonacademic self-concepts were examined under the 
same conditions as postulated in Model 6 with the addition of the followings: Family should 
be more highly correlated with Parent Relation self-concept than with the two academic 
scales; Friend should be more highly correlated with both Opposite-sex relation and Same-
sex relation self-concepts than with the two academic scales; Avoidance should be more 
negatively correlated with Honesty-Trustworthiness self-concept than with the two academic 
scales. Since Model 6b with one correlated uniqueness provided a better fit to the data than 
Model 6a without correlated uniqueness, Model 7 also included correlated uniqueness for 
model fit (Table 1). Family was found to be more highly correlated with Parent relation self-
concept ($r=.68$) than with Math ($r=.23$) and Verbal self-concepts ($r=.19$), Friend was more 
highly correlated with Opposite-sex relation and Same-sex relation self-concepts ($r=.36$ and 
$.53$ respectively) than with Math ($r=.07$) and Verbal ($r=.20$) self-concepts and, Avoidance 
was more negatively correlated with Honesty-Trustworthiness self-concept ($r=-.53$) than with 
Math ($r=-.28$) and Verbal self-concepts ($r=-.34$). The results provided support for using these 
three external criteria in testing the convergent and discriminant validity of factor structure of 
the four nonacademic self-concepts in between-network studies.

Discussion

This study validates the factor structure of four SDQII nonacademic self-concepts by using 
three nonacademic external criteria. The results clearly support the factor structure of these 
four SDQII nonacademic self-concepts by showing that the correlations between the 
external criteria and their corresponding nonacademic self-concepts follow the theoretical 
and logical pattern. First, Family was correlated more highly with Parent relation than with 
other nonacademic SDQII factors, Friend was correlated more highly with Same-sex relation 
and Opposite-sex relation than with other nonacademic SDQII factors, whereas Avoidance 
was correlated more negatively with Honesty-Trustworthiness than with other nonacademic 
SDQII factors. Second, the validity of using these three external criteria in testing the factor 
structure of the four nonacademic self-concepts instead of academic self-concepts was 
supported. Because each external criterion was correlated more highly with the 
corresponding nonacademic self-concept than with the two academic self-concepts or with 
the other nonacademic SDQII factors, the convergent and discriminant validity of these four 
nonacademic self-concepts were strongly supported. Of particular interest is the finding that 
there is a higher correlation between perceived support from friends with Same-sex relation 
($r=.53$) than with Opposite-sex relation self-concept ($r=.36$). It may be explained that since 
the participants in the present study were adolescents whose main source of peer support 
came primarily from same-sex peers rather than from opposite-sex peers (Lempers & Clark-
Lempers, 1993), their perception of support from friends would probably depend largely on 
their same-sex peer relation. However, this speculation may need further investigation.
While the findings of this study provide preliminary evidence to support the construct validity of four nonacademic SDQII self-concept, further investigation may be required to employ more extensive external criteria as conducted in physical self-concept studies (Marsh, 1993b, 1996). A major limitation of the present study is that due to the limited sample size of the 11th graders of this study, a comparison between 11th graders and 7th graders was impossible. Hence, the generalisability of the findings to different age groups comes into question and it requires future research to confirm it. Whether the results are stable over time on multiple occasions also deserves further study. Nevertheless, the present study has provided preliminary support for the construct validity of the nonacademic SDQII self-concepts considered here. Hence, the multidimensionality of self-concepts as postulated in the Shavelson model need to be considered in the self-concept research whether the focus is on academic or nonacademic domains.
References


Table 2

CFA Solution for Model 8: Correlation of 4 SDQII Nonacademic and 2 Academic factors with 3 external criteria

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Correlations among constructs

OSEX --
SSEX .37* --
HON .05 .28* --
PAR .20* .31* .46* --
MATH .23* .12 .34* .23* --
VERB .16* .27* .40* .12 .39* --

FAMILY .32* .33* .38* .68* .23* .19* --
FRIEND .36* .53* .26* .25* .07 .20* .58* --
AVOIDANCE -.13 -.29* -.53* -.25* -.28* -.34* -.29* -.22* --

Note. N = 244. Nonacademic Self-concept constructs (Opposite-sex relation (OSEX), Same-sex relation (SSEX), Honesty-Trustworthiness (HON), Parent relation (PAR) respectively) and Academic Self-concepts constructs (Math(MATH), Verbal (VERB) respectively) were measured with item pairs (P1 to P4 for OSEX AND PAR; P1 to P5 for SSEX, HON, MATH AND VERB). FAMILY = perceived support from family. FRIEND = perceived support from friends. AVOIDANCE = avoidance coping strategies. Uniq = uniqueness.

* p < .05