DOCUMENT RESUME

ED 339 733 TM 017 640

AUTHOR Hofmann, Rich; Sherman, Larry
TITLE Coopersmith Self-Esteem: Two Different Hypothesized Factor Models--Both Acceptable for the Same Data Structure.
PUB DATE Oct 91
NOTE 20p.; Paper presented at the Annual Meeting of the Midwest Educational Research Association (Chicago, IL, October 1991).
AVAILABLE FROM Rich Hofmann, Department of Educational Leadership, Miami University, 350 McGuffey Hall, Oxford, OH 45056.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adolescents; Algorithms; Chi Square; *Factor Structure; *Goodness of Fit; Hypothesis Testing; Intermediate Grades; Junior High Schools; *Junior High School Students; Middle Schools; Models; Psychometrics; *Self Concept Measures; Self Esteem; Test Theory
IDENTIFIERS *Coopersmith Self Esteem Inventory; Exploratory Factor Analysis

ABSTRACT

Using data from 135 sixth-, seventh-, and eighth-graders between 11 and 15 years old attending a middle school in a suburban Southwest Ohio school district, two hypothesized models of the factor structures for the Coopersmith Self-Esteem Inventory were tested. One model represents the original Coopersmith factor structure, and the other model is derived from an exploratory factor analysis of the data. Both models were tested using the EQS confirmatory factor analysis algorithm. Neither model defined an acceptable fit to the data. The EQS algorithm was then modified to iterate to a best fit model, non-significant chi square, through the systematic elimination of bad fit variables, statements, in a hypothesized model. The iterations resulted in a modification of both original hypothesized models, with the end result being that both modified models represented acceptable fits to the data. Both confirmed models are discussed in terms of their psychometric properties and in terms of their fit to the theory of self-concept. It is concluded that the confirmed exploratory model is superior to the confirmed Coopersmith model theoretically and psychometrically. Six tables and one graph present study data. A 20-item list of references is included. (Author/SLD)

Coopersmith Self-Esteem: Two Different Hypothesized Factor Models - Both Acceptable For The Same Data Structure

RICH HOFMANN & LARRY SHERMAN
Miami University

ABSTRACT

Using data gathered from 135 respondents between the ages of 11 and 15, two hypothesized models of the factor structures for the Coopersmith Self-Esteem Inventory are tested. One model represents the original Coopersmith factor structure and the other model is derived from an exploratory factor analysis of the data. Both models are tested using the EQS confirmatory factor analysis algorithm. Neither model defined an acceptable fit to the data. The EQS algorithm was then modified to iterate to a best fit model, non-significant chi-square, through the systematic elimination of bad fit variables, statements, in a hypothesized model.

The iterations resulted in a modification of both original hypothesized models with the end result being that both modified models represented acceptable fits to the data.

Both confirmed models are discussed in terms of their psychometric properties and in terms of their fit to the theory of self-concept. It is concluded that the confirmed Exploratory model is clearly superior to the confirmed Coopersmith model theoretically and psychometrically.

Paper presented at the annual meeting of the Midwest Educational Research Association, Chicago, October 1991.

Request for copies should be sent to :

Rich Hofmann
350 McGuffey Hall
Department of Educational Leadership
Miami University
Oxford, OH 45056

Factor analysts have long argued that the factor analysis of correlations defined by 1-0 data is subject to defining factors that are artifacts of variable difficulties (Hofmann & Gray,1978). That is, variables tend to be grouped together to define factors because they have means of similar magnitudes. Such factors do not generalize well and do not represent meaningful factors.

Coopersmith (1967) has defined five subscales on his self-esteem instrument. These subscales were derived from the factor analysis of 1-0, (unlike me/like me), data and may not represent the true theoretical constructs associated with the variables. That is, the Coopersmith factors may not generalize to other data sets.

In the present study the response format was modified to a ten point response scale, very false to very true. The original intention of this study centered around a comparison of Coopersmith's factors with a set of factors determined by an exploratory factor analysis of the data defined by the ten point response scale Would a structure similar to the Coopersmith structure emerge from the exploratory factor analysis or would a different factor structure emerge? If a different factor structure emerged which structure would be judged as the "best structural model" to represent the data - the Coopersmith model or the model derived from the exploratory factor analysis, the Exploratory model?

The exploratory analysis did define a factor structure different from the one discussed by Coopersmith. To compare the hypothesized models both solutions were analyzed using Bentler's (1989) EQS. Surprisingly neither hypothesized solution appeared to be statistically adequate for the data! Traditional confirmatory factor analytic thinking would suggest that both structural models be abandoned. However, there were some similarities between the two models and it was concluded that it might be possible to adjust a hypothesized model to obtain a statistically satisfactory fit to the empirical data.

Thus, rather than abandon both structures a new statistical procedure was derived, "feathering". The process of feathering a confirmatory factor model is based on the premise that it is not the whole hypothesized model that is responsible for an inadequate fit to a data structure. Rather, it is assumed that there are some variables that do not fit a data set as hypothesized. Feathering is a procedure that identifies the worst fitting variable in a confirmatory solution and then eliminates it from the

hypothesized model. The process is iterative, continuing to eliminate a single variable at a time and concurrently improving the fit of the variables remaining in the hypothesized model. Given the inadequate fit of both the Coopersmith model and the Exploratory model as originally hypothesized the major objective of this study became one of determining which hypothesized model could be feathered enough to provide an adequate fit to the data.

METHODS

Method of Confirmatory Analysis: Feathering

To compare the hypothesized models both models were analyzed using Bentler's (1989) EQS. Surprisingly neither hypothesized model appeared to be statistically adequate for the data! Rather than abandon both structures a new statistical procedure was derived, "feathering". The process of feathering a confirmatory factor model is based on the premise that it is not the whole hypothesized structure that is responsible for an inadequate fit to a data structure. Rather, it is assumed that there are some variables ~~that~~ do not fit a structure as hypothesized. Feathering is a procedure that identifies the worst fitting variable in a confirmatory model and then eliminates it from the hypothesized structure. The process is iterative, continuing to eliminate a single variable at a time and concurrently improving the fit of the remains of the hypothesized structure to the data set. Given the inadequate fit of the structures as originally hypothesized the major objective of this study became one of determining which hypothesized structure could be feathered enough to provide an adequate fit to the data.

Two hypothesized models are discussed, one based on a Kaiser Image Analysis followed by an Orthotran oblique solution (Feldman, Gagon, Hofmann and Simpson, 1989), the other based on the statement groupings reported by Coopersmith (1967) as a result of his unreported factor analysis of binary data. The confirmatory analyses, used to determine the statistical adequacy of the hypothesized factor models, were carried out using maximum likelihood estimation procedures within the context of Bentler's (1990) EQS algorithms.

In hypothesizing models the statements were hypothesized as being associated with a particular factor. No statement was hypothesized as being associated with more than one factor. All factors variances were fixed at 1.0. The factor covariances were unconstrained. . Factor loadings were

hypothesized as being either positive or negative, but were otherwise estimated by the algorithm. All variable residuals were unconstrained.

Tables 1 and 2 indicate the general factor structure by statement membership for both original and modified models as derived from the exploratory factor analysis, Table 2, and for the factors as described by Coopersmith (1967), Table 1

Table 1. Summary of confirmatory factor structure before and after feathering iterations on the *Coopersmith model*. Statements retained in the final confirmatory solution are preceeded by their factor loading as defined by the confirmatory solution. - **about here**

Table 2. Summary of confirmatory factor structure before and after feathering iterations on the *Exploratory model*. Statements retained in the final confirmatory solution are preceeded by their factor loading as defined by the confirmatory solution. **-about here**

To determine the adequacy of the fit of a hypothesized model to a given data set Bentler provides several variations of a fit index, Bentler&Bonnett (1980,1990). Most confirmatory algorithms also use a model goodness-of-fit chi square test. It is the model goodness-of-fit test that was used as the single criterion of fit in this study. Specifically the feathering procedure as used here is loosely derived from Bentler's (1990) discussion of model modification. It is intended to reduce the chi-square value more rapidly than it reduces the degrees of freedom associated with the model being tested. The ultimate objective of feathering is to produce a non-significant($p > .05$) chi square value indicative of a satisfactory statistical fit of the feathered hypothesized model to the empirical data.

In describing the fit of a hypothesized model to an empirical data set residuals are determined as the difference between the observed correlations and the correlations as reproduced from the hypothesized model. The hypothesized model associated with a pair of statements having a relatively small absolute residual, absolute value of the residual, does a good job of reproducing the statements' relationship. The hypothesized model associated with a pair of statements having a relatively large absolute residual does a poor job of reproducing the statements' relationship. It may be concluded that as the relative magnitude of the absolute residual associated with a pair

of statnents becomes larger, the fit of the associated hypothesized model becomes poorer. The feathering procedure seeks to eliminate the single poorest fitting statement associated with a confirmatory model. The poorest statement is identified as that statement with the largest estimated mean absolute residual.

The feathering process is iterative with each iterative stage eliminating the single poorest fitting statement. To the extent that the feathering is fully functional in refining the fit of a hypothesized model to a given data set each iterative stage should: (a) reduce the chi-square value more rapidly than it reduces the degrees of freedom which requires that each stage produces a statistically significant reduction in the chi-square goodness of fit value; (b) increase all fit indices. The feathering process is continued until the chi-square goodness of fit value is **not** statistically significant, indicating a good fit of hypothesized model to data.

Subjects

The subjects used in this study were sixth, seventh, and eighth grade students who attended middle school in a suburban, Southwest Ohio school district. All participating students were selected according to availability from a total population of approximately 1,750 students attending two middle schools. Ninety-three percent of these students were enrolled in the regular education classroom curriculum with both males and females being represented. Although all ranges of socioeconomic status were represented in the two schools, subjects were predominantly middle-class, white students. Approximately fifty to fifty-five percent of the students in this district enter college. Forty-four percent of the students were male, fifty-six percent were female, and the overall mean age was 12.55 years.

RESULTS

Methodological Results - Psychometric Properties of Confirmed Factors

The feathering procedure reduced the statements of both hypothesized models with the result that both resultant models fit the data well. The Exploratory model provided a better fit initially than did the Coopersmith model and took fewer iterations (22) to define a satisfactory fit than did the Coopersmith model (34 iterations), see Figure 1. However, a satisfactory fit was achieved after both of the hypothesized models were modified by the feathering procedure.

Figure 1 Bentler-Bonett Indices across iterations - **about here**

The fit indices for the initial and final confirmatory solutions for both hypothesized models are quite similar, with one exception, and are summarized in Table 3. The one exception is the probabilities associated with the final chi-square goodness of fit. The probability associated with the Coopersmith model is .06 while the probability associated with the Exploratory model is .25. Inasmuch as the larger probability is associated with the better model fit this would suggest that the Exploratory model fits the empirical data better than the Coopersmith model.

Table 3. Fit indices for first and last iterations of Coopersmith and Exploratory hypothesized solutions. - **about here**

The overall change in chi square, from first to final iteration, of the exploratory factors was significant, ($\chi^2(799)= 1335.28$, $p<.001$), as was the overall change in chi square for the iterations associated with the Coopersmith model, ($\chi^2(1402)= 2744.06$, $p<.001$). As indicated in Figure 1 the effectiveness of the iterations in terms of the "stage-wise" refinement of the hypothesized models was very systematic increasing the fit indices associated with the hypothesized models at each iterative stage, see Figure 1. The final Exploratory model that fits the empirical data set has 23 statements associated with it. The final Coopersmith model that fits the empirical data set has 20 statements associated with it.

Table 4 Intercorrelations between factors based on subscale scores derived from statements defining factors. - **about here**

To better understand the similarity and differences of the two sets of factors, average factor subscores were determined from the responses to the statements associated with the confirmed factors. Coefficient alpha reliabilities were determined for each factor along with means and standard deviations, Table 5. The intercorrelations of the factor subscores between and within confirmed factor models were also determined, Table 4. Several important psychometric generalizations are apparent from this table.

Generally the confirmed exploratory factors have higher coefficient alpha reliabilities than the confirmed Coopersmith factors even though the individual Coopersmith factors tend to be defined by more statements than the exploratory factors. As evidenced by the correlation of factors within model, the factors associated with the Exploratory model tend to have considerably lower intercorrelations amongst themselves than the factors associated with the Coopersmith model. This suggests an independence of content from exploratory factor to exploratory factor. The higher intercorrelations associated with the Coopersmith factors suggests a degree of content overlap between the them.

Table 5. Descriptive statistics for mean subscale scores derived from statements defining factors. (n=132). **- about here**

It is also apparent from Table 4 that exploratory factors 5 and 7 and factor 1 to a much lesser degree are highly correlated with all of the Coopersmith factors and also with each other. Exploratory factors 2, 4 and 6, not highly correlated with each other or any other factors appear to be dealing with independent content.

The psychometric properties of the confirmed exploratory factors suggest that they may be more desirable than the confirmed Coopersmith factors. The probabilities associated with the final fit as previously discussed also suggest that the Exploratory model fits the data better than the Coopersmith model. From a statistical perspective it would appear that the Exploratory model is a better model for these data than the Coopersmith model.

Self-concept Theory and the Interpretation of the Factors associated with the Confirmed Models

Many studies have attempted the dimensionalization of self-concept. Wylie's (1974 & 1979) as will as Harter's (1983) discussions of the self-perception system have likewise suggested a complex and multifaceted construct. The present two authors have previously discussed the multidimensional nature of this construct (Sherman & Hofmann, 1988).Coopersmith's (1967) earlier factor-analyses generated five factors described as follows: (I) General Self; (II) Social Self-Peers ; (III) Home/Parents; (IV) School Academic Self; (V) Lie Scale

The Piers-Harris Children's Self-concept Scale (Piers, 1969), reports six factors including: (I) Behavior; (II) Intellectual and School Status; (III) Physical Appearance and Attributes; (IV) Anxiety ; (V) Popularity; (VI) Happiness and Satisfaction.

Both the Piers-Harris and the Coopersmith measures allow one to obtain an overall score which is the summation of all the statements in their respective instruments. This score might be interpreted as a General Self-Concept score. More recent examination of factor structure of self-concept has been accomplished by Herbert Marsh and associates (Marsh, 1988; Marsh, 1990-a; Marsh, 1990-b; Marsh and Byrne, 1988;Marsh and Craven, 1991-a; Marsh and Craven, 1991-b; Marsh and Shavelson, 1985). Marsh's (1988) SDQ-I, II and III instrument has generated a self-concept model which includes nine components and a total score: (I) Physical Activity; (II) Physical Appearance ; (III) Peer Relationships; (IV) Parent Relationships; (V) Reading; Mathematics; (VI) General School Self; (VII) General Self; (VIII) Nonacademic Self; (IX) Academic Self; (X) A total score.

Marsh's model relies quite heavily upon elements which might be described as "ecological contexts," or "situation specificity." In other words,there are specific contexts within which one formulates their intra-personal perceptions such as specific academic subject areas (for example.,mathematics or reading abilities).

These past research activities appear to be generating "replicable" factors in the self-concept system. One observation concerning these past studies might be that as the knowledge about the self-concept system is advanced, rather than treating it as a global construct, it has become increasingly more differentiated and multidimensional. However, while the Piers-Harris, Coopersmith and Marsh instruments are constructed with different statements, the fact that they psychometrically arrive at similar factors tends to demonstrate the external validity of the multidimensional nature of self-concept. This growing external validity suggests that there may be an almost unlimited number of ecological contexts within which a person might be formulating his or her inter-personal perceptions of self.

Nevertheless, the present analyses of the 58 statement Coopersmith instrument in its rescaled format, appear to have confirmed some of the factors described by earlier studies, as well as introduced some "new" contextual factors not previously discussed. Two factor models were

confirmed: one model was based on Coopersmith's original five factor model and was subsequently reduced to four factors through the feathering technique, the second model, a seven factor model, was based on a new exploratory factor analysis of the 58 Coopersmith statements and was subsequently reduced to six factors through the confirmatory feathering process. The self-concept factors of the previously mentioned studies along with the self-concept factors associated with this study are summarized in Table 6.

Table 6 about here Self-Concept Factors Across Different Studies And Instruments.

Factors of the Confirmed Exploratory model and Self-concept Theory

The first two factors appear to be a further differentiation of the parental and/or familial context. Marsh's SDQ instrument seems to be defining a similar general factor associated with "Parent Relationships." Factor I is described as "Parental Dominance," while Factor II appears to be concerned with "Parental Consideration and Satisfaction". As can be seen in Table 2, the first three statements with the largest loadings on Factor I are concerned with pressures associated with unreasonable parental expectations and the feeling of being "pushed around." At one end of the continuum is the perception of being "dominated", and at the other end the perception of not being dominated by ones parents. This factor is moderately to strongly related to all four of the confirmed Coopersmith factors with correlations ranging from .27 to .78 (See Table 4).

The statements with the highest loadings on Factor II are concerned with children's perceptions of their parental consideration of their feelings as well as the positive and enjoyable nature of the family environment. At one end of the continuum is the perception of parental acceptance and consideration which goes along with an enjoyable parental relationship. At the other end of the continuum there is a perception of lack of consideration and a not so enjoyable relationship with ones' parents. This factor might be similar to the one described by Piers-Harris (1969) as "Happiness and Satisfaction." Both Factors I and II appear to be focused in the ecological context of the home and are directly associated with two types of parental relationships. However, Factor II does not seem to be related to any of the

original or final factors from the Coopersmith model and represents a new contextual factor.

Factor IV might be described as a "Perfection" factor. All of the statements loading on this factor seem to reflect an unreasonable perception of perfection, such as "always" doing the right thing, liking everyone, knowing what to say to people, telling the truth, and never being scolded. Some might suggest that extreme scores on this factor reflect being out of touch with reality: for example., always or never doing the right thing; liking everyone vs. liking no one; always or never telling the truth. This factor has no practical linear relationship with any of the original or final four confirmed factors of the Coopersmith model, but this independence is a strength implying that Factor IV represents a new self-concept factor.

Factor V could be described as a "General School Self-concept." Only two of the four statements defining the original exploratory factor survived the feathering process. The statement with the highest loading on this factor is concerned with being discouraged with the self in the context of the school. The other statement associated with this factor focuses upon not being satisfied with one's self and wishing to make many changes - if possible. This factor is very highly correlated with Coopersmith's Factor 4 which was labeled "School/Academic Self". But, it is also highly correlated with all four confirmed factors of the Coopersmith model supporting the use of the term "general" in the factor name. Piers-Harris has a similar factor labeled "Intellectual/School Status". Marsh's SDQ instrument, while defining two academic contexts, Reading and Mathematics, also has a "General School Self-concept" factor. In a sense, this suggests that Factor V. General School Self-concept, may have some external validity.

Factor VI seems to be one of the few factors in which no specific ecological context is designated in the statements. However, the two statements which are associated with this factor use the terms "worry" and "bother". Thus the factor is labeled as "Anxiety." These two statements are expressing the lack of anxiety about problems in general, i.e., "things." At one end of the continuum is composure and confidence (as in the phrase, 'not to worry!'), at the other end is bothersome and generated anxiety. The Piers-Harris instrument suggests a similar factor called "Anxiety". This factor does not appear to be correlated with any of the confirmed factors associated with the Coopersmith model.

Factor VII also appears to reflect several different ecological contexts including the school setting, the home and life in general. The perceptions of being "upset" in school and at home, the feeling of being all mixed up, daydreaming, and stating that "it's tough to be me" imply, at one end of a continuum, a general dissatisfaction with the self, while at the other end, a general satisfaction with the self. In this sense Factor VII might be described as a "General Self-concept" factor. This is not unusual in that most other self-concept scales also describe a general self factor. As can be seen in Table 4, Factor VII obtained the highest correlation in the table, r = .87, and that was with General Self, the confirmed Coopersmith Factor I.

Factors of the Confirmed Coopersmith Model and Self-concept Theory

The factors remaining after the Coopersmith-based model, see Table 1. was analyzed using the confirmatory feathering process, were not as easily interpreted as were those associated with the confirmed Exploratory model. Whereas individual statements associated with the Exploratory model appeared to have some coherent association with each other, many times being quite similar in their context specificity, the confirmatory feathering process applied to the Coopersmith model resulted in clusters of statements which seem to cut across several settings (home,school, friends, etc.). Given this broad context for each factor it is not unreasonable to conclude that they all represent variations of a "general self-concept" factors. As can be seen in Table 4 the confirmed Coopersmith factors are not independent of each other, having substantial intercorrelations ranging from r = .25 to r = .66. The names applied to the original Coopersmith factors are no longer appropriate descriptors of the feathered factors. It is important to note that Factor VII from the confirmed Exploratory model,"General Self-concept," is also highly correlated with all four confirmed Coopersmith factors, ranging from r = .53 to r = .87. Therefore, new labels have not been created for each of these factors. It has been concluded that they are all variations of the "General Self-Concept" theme.

CONCLUSIONS

We were unable to provide any theoretically compelling differentiation between the factors associated with the confirmed Coopersmith model. However, we believe the some of the factors associated with the confirmed Exploratory model represent factors that have been identified by other factor analytic studies using different instrumentation.

These factors have external validity. Certain other factors associated with the confirmed Exploratory model are new factors, but are also theoretically meaningful. On the basis of self-concept theory it must be concluded that the factors associated with the confirmed Exploratory model are more valid than the factors associated with the confirmed Coopersmith model.

The psychometric properties associated with the factors of the confirmed Exploratory model suggest that they may be more desirable than the factors associated with the confirmed Coopersmith model. The probabilities associated with the final fits of the two models also suggest that the confirmed Exploratory model fits the data better than the confirmed Coopersmith model. From a statistical perspective it would appear that the Exploratory model is a better model for these data than the Coopersmith model.

On the basis of the information provided it is concluded that : (a) the confirmatory feathering procedure is a viable psychometric procedure; (b) two confirmed factor models for the same data set may be evaluated in terms of psychometric goodness as well as in terms of goodness of theory in order to determine which solution is the better solution; (c) the confirmed Exploratory model for the Coopersmith instrument provides a better psychometric model and a better theory model than the original Coopersmith model that was derived from a factor analysis of binary data.

References

Bentler, P.M. (1990). **Theory and implementation of EQS a structural equations program: Version 3.0.** Los Angeles: BMDP Statistical Software.

Bentler, P.M., and Bonett, D.G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. **Psychological Bulletin, 88,** 588-606.

Coopersmith, S. (1967) **The antecedents of self-esteem.** San Francisco, W.H. Freeman.

Feldman, D., Gagon,J., Hofmann, R., and Simpson,J (1988). **Statview SE + graphics.** Berkeley: Abacus Concepts

Harter, S. (1983). Developmental perspectives on the self-system. In P. H. Mussen (Ed.), **Handbook of Child Psychology,** (4th ed., Vol. 4, pp. 275-385). New York: Wiley.

Hofmann, R.J. and Gray, W.M. (1978) On partialing a simplex out of binary data. **Multivariate Behavioral Research,** 13, 223-227.

Joreskog, K.G., and Sorbom, D. (1979). **Advances in factor analysis and structural equation models.**Cambridge:Abt.

Marsh, H. W. (1988). **Self Description Questionnaire: A theoretical and empirical basis for the measurement of multiple dimensions of preadolescent self-concept: A test manual and a research monograph.** San Antonio, TX: Psychological Corporation.

Marsh, H. W. (1990). A multidimensional, hierarchical model of self-concept: Theoretical and empirical justification. **Educational Psychology Review,** 2, 77-172.

Marsh, H. W. (1990). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. **Journal of Educational Psychology,** 81, 417-430.

Marsh, H. W., & Craven, R. G. (1991). Self-other agreement on multiple dimensions of preadolescent self-concept: Inferences by teachers, mothers, and fathers. **Journal of Educational Psychology,** 83(3), 393-404.

Marsh, H. W., & Shavelson, R. J. (1985). Self-concept: Its multifaceted, hierarchical structure. **Educational Psychologist,** 20, 107-125.

Marsh, H. W., Byrne, B. M., & Shavelson, R. (1988). A multifaceted academic self-concept: Its hierarchical structure and its relation to academic achievement. **Journal of Educational Psychology**, 80, 366-380.

Marsh, H. W., Craven, R. G., & Debus, R. (1991). Self-Concepts of young children 5 to 8 years of age: Measurement and multidimensional structure. **Journal of Educational Psychology**, 83(3), 377-392.

McNeil, E.B., & Rubin, Z. (1977) **The psychology of being human.** San Francisco: Canfield Press

Piers, E. (1969) **Manual for the Piers-Harris children's self-concept scale.** Nashville, TN: Counselor Recordings and Tests.

Sherman, L., & Hofmann, R. (1988). Multi-faceted dimensions of self-concept and personal control: A collection of six related studies. Paper presentation to the Annual meetings of the Mid-Western Research Association, Chicago, IL:, October 14, 1988.

Wylie, R. (1974) **The self-concept.** Lincoln: University of Nebraska Press.

Wylie, R. C. (1974). **The self-concept (Vol. 1)**. Lincoln, NE: University of Nebraska Press.

Wylie, R. C. (1979). **The self-concept (Vol. 2)**. Lincoln, NE: University of Nebraska Press.

Table 1. Summary of confirmatory factor structure before and after feathering iterations on the Coopersmith factor solution. Statements retained in the final confirmatory solution are preceeded by their factor loading as defined by the confirmatory solution.

confirmatory loading	statement number	content
Coopersmith I		**General Self**
.73	56.	I often get discouraged in school
.59	43.	I often feel ashamed of myself
.58	12.	I get easily upset at home
.57	3.	I often wish that I were someone else
.40	30.	I pretty tough to be me
.39	1.	I spend a lot of time daydreaming
.33	15.	I someone has to tell me what to do
.11	25	I would rather play with children younger than me
-.12	34.	I never get scolded
		Eliminated from Coopersmith I
		4, 7, 10, 13, 18, 19, 24, 27, 31, 35, 38, 39, 47, 48, 51, 55, 57
Coopersmith II		**Social Self-Peers**
.26	40.	There are many times when I would like to leave home
.24	49.	My teacher makes me feel I'm not good enough
		Eliminated from Coopersmith II
		5, 8, 14, 21, 28, 52
Coopersmith III		**Home/Parents**
.70	9.	There are a lot of things about myself that I would change if I could.
.52	44.	I'm not as nice looking as most people
.52	16.	It takes me a long time to get used to anything new
-.19	11.	I'm a lot of fun to be with
		Eliminated from Coopersmith III
		6, 20, 22, 29
Coopersmith IV		**School/Academic**
.68	42.	I often feel upset in school
.59	54.	I usually feel as if my parents are pushing me.
.42	46.	Kids pick on me very often
.38	33.	No one pays much attention to me at home
.29	37.	I don't like being boy/girl
-.11	23.	I can usually take care of myself
		Eliminated from Coopersmith IV
		2, 17
Coopersmith V		**Lie**
		Eliminated from Coopersmith V
		26, 32, 36, 41, 45, 50, 53

Table 2. Summary of confirmatory factor model before and after feathering iterations on the exploratory factor solution. Statements retained in the final confirmatory solution are preceeded by their factor loading as defined by the confirmatory solution.

confirmatory loading	statement number	content
Exploratory I		**Parental Dominance**
.75	54	I usually feel as if my parents are pushing me.
.59	26	My parents expect too much from me
.35	15	Someone always has to tell me what to do
.32	37	I really don't like being a boy/girl
		Eliminated from Exploratory i
		17, 25, 39, 53
Exploratory II		**Parental Consideration**
.90	5	My parents and I have a lot of fun together
.54	19	My parents usually consider my feelings
.24	29	I understand myself.
.09	23	I can usually take care of myself.
		Eliminated from Exploratory II
		2, 4, 10, 11, 24, 28, 36, 47
Exploratory III		
		Eliminated from Exploratory III
		7, 16, 22, 41
Exploratory IV		**Perfection**
.60	13	I always do the right thing
.58	27	I like everyone I know
.56	55	I always know what to say to people.
.53	48	I will always tell the truth
.41	34	I never get scolded
		Eliminated from Exploratory IV
		20, 45
Exploratory V		**General School Self-concept**
.71	56	I often get discouraged in school.
.65	9	There are a lot of things about myself that I would change if I could
		Eliminated from Exploratory V
		14, 35
Exploratory VI		**Anxiety**
-.61	6	It is not like me to worry about everything.
-.55	57	Things usually don't bother me.
		Eliminated from Exploratory VI
		18, 32, 46

Table 2 continued

Exploratory VII		General Self-concept
.65	42	I often feel upset in school.
.63	12	I get upset easily at home.
.58	3	I often wish I were someone else.
.57	31	Things are all mixed up in my life.
.41	30	It's pretty tough to be [illegible].
.35	1	I spend a lot of time daydreaming.
		Eliminated from Exploratory VII
		40

Table 3. Fit indices for first and last iterations of Coopersmith and Exploratory hypothesized solutions.

Coopersmith first	Coopersmith last	Exploratory first	Exploratory last	
2957.31	213.60	1554.876	250.11	χ^2 fit
1585	183	1012	236	degrees of freedom
p< .001	p= .060	p< .001	p= .252	probability
1.87	1.17	1.54	1.06	ratio of chi-square to degrees of freedom
.35	.69	.41	.70	normed fit index
.38	.93	.63	.97	unnormed fit index
.08	.05	.07	.05	average absolute standardized residual off-diagonal
.09	.06	.08	.05	average absolute standardized residual

Table 4 Intercorrelations between factors based on subscale scores derived from statements defining factors.

	EXP 1	EXP 2	EXP 4	EXP 5	EXP 6	EXP 7	COP 1	COP 2	COP 3	COP 4
EXP-1	1.00									
EXP-2	-.20	1.00								
EXP-4	-.03	.19	1.00							
EXP-5	.40	-.04	-.22	1.00						
EXP-6	.01	.17	.42	-.22	1.00					
EXP-7	.53	-.22	-.13	.66	-.20	1.00				
COP-1	.59	-.12	-.01	.72	-.13	.87	1.00			
COP-2	.42	-.18	-.13	.49	-.05	.56	.55	1.00		
COP-3	.27	.03	-.12	.75	-.20	.53	.58	.25	1.00	
COP-4	.78	-.14	-.01	.52	-.12	.65	.66	.56	.38	1.00

Table 5. Descriptive statistics for mean subscale scores derived from statements defining factors. (n=132)

factor	mean	standard deviation	range	coefficient alpha	number of statements
Exploratory 1	4.73	1.88	8.33	.57	4
Exploratory 2	2.15	1.49	6.50	.49	4
Exploratory 4	5.05	1.79	9.00	.59	6
Exploratory 5	4.05	2.58	9.00	.64	2
Exploratory 6	5.61	2.12	9.00	.46	2
Exploratory 7	4.73	1.88	8.00	.71	7
Coopersmith 1	5.32	1.43	6.00	.61	9
Coopersmith 2	5.27	2.33	9.00	.12	2
Coopersmith 3	3.66	1.61	6.50	.43	4
Coopersmith 4	5.39	1.46	6.50	.54	6

Table 6 Self-Concept Factors Across Different Studies And Instruments.

Generic Factor Labels	Coopersmith Exploratory (present study)	Exploratory Analysis (present study)	Piers-Harris (1969)	Marsh's (1988) SDQ I, II, III
General Self-Concept	I, II, III, IV	VII	Total Score	VIII, Total Score
Home/Parent relationshipd	III	I, II		IV
Happiness & Satisfaction		II		
(Social-Peer Relationships)	II		V	III
Anxiety		VI	IV	
General Academic/School	IV	V	II	VII, X
Reading				V
Math				VI
Physical Ability			I, IV	II
Physical Appearance			III	I
Lie Scale	V			
Perfection		IV		

Roman numerals in columns reflect the factor numbers indigeneous to eachstudy.

Figure 1 Bentler-Bonett Indices across iterations