THE RELATIONSHIP BETWEEN GLOBAL SELF-CONCEPT, SPECIFIC SELF-CONCEPTS, AND THE TEXAS ASSESSMENT OF ACADEMIC SKILLS ACHIEVEMENT TEST

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Abstract

The purpose of this study was to investigate the relationship between student self-concept, both in a global sense and more specific areas, with achievement scores in reading and mathematics. Eighty-eight students in the eighth grade of a suburban southeast Texas metropolitan school participated in the study. Student self-concept was assessed with the Piers-Harris Children's Self-Concept Scale and academic achievement was measured by the Texas Assessment of Academic Skills annual test battery. A significant correlation ($r = .511, p < .001$) was found between global self-concept and reading achievement and a weaker positive correlation was found for mathematics achievement. The study concluded with a discussion about the weakness between student happiness and satisfaction self-concept and academic achievement.

A debate has raged in the literature for three decades about the efficacy of Global Self-Concept assessment scales to predict academic success as measured by student grades, criterion -referenced tests, and norm-reference tests. A surge in research about self-concept in general, and specific academic self-concepts in particular, has made this topic one of the most debated in educational psychology literature (Strein, 1993). This article focuses on the theoretical models of self-concept (SC) as they predict academic success and an inquiry into the relationship between a measure of Global Self-Concept (GSC) and a measure of academic achievement.

Models of Self-Concept

Self-Concept theory and research has advanced four models–nomothetic, taxonomic, compensatory, and hierarchical. The nomothetic, or generalized model, views SC as a unidimensional construct in which global positive or negative view of one's self "pervasively af-

fects one's behavior in a wide variety of situations." Proponents as Winnie and Rosenberg argued that various self-perceptions are best subsumed under a single, general factor rather than being divided among separate domains. Instruments such as the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Piers-Harris Children's Self-Concept Scale (Piers, 1996) yield a global rating of self-concept. A number of more recent factor analysis studies have challenged the long-held view that SC is a unitary, global construct, and countered with the suggestion that a positive SC in one domain may not predict a positive view in another domain. Finally, a review of research articles has shown that school programs to improve student self-concept have not led to measurable improvements in academic achievement (Strein, 1993).

Shavelson, with others, advanced a theory that SC is a multifaceted, hierarchical structure, with perceptions of behavior at the base, moving to inferences about self in subareas, then to inferences about self in more generalized areas, and finally, to inferences about self in general. Further, they postulated that SC becomes increasingly more multifaceted with age and is differentiable from other psychological constructs, such as academic achievement. Conversely, although SC is stable in general terms, as one descends the hierarchy, SC becomes increasingly situation specific and, as a consequence, less stable. However, in a test of this hypothesis, it was found that subareas did not become less stable, that changes in SC did not operate from the base upwards, and that the results of the study pointed to a causal predominance of SC over achievement (Shavelson & Bolus, 1982). In another test of this theory, the author concluded that "the results further amplify the complexity of the SC structure" (Shavelson & Byrne, 1986).

A subset of the Hierarchical Model is the concept of Academic Self-Concept. Correlations between subject-specific self-concepts (for example, math self-concept) and performance on achievement measures in the corresponding subject area typically range from .2 to .4. Research on the causal ordering of the relationship between academic SC and achievement has not produced definitive results (Strein, 1993).

The Taxonomic Model is related to the Shavelson model in that it depicts SC as multifaceted, but the various components of SC are only weakly related. The major implication of this model is that a change in any given SC domain would not lead to even a minor change in any other domain. Little recent research is available that tests this model, and it is therefore probably a passing notion (Strein, 1993).

Finally, the Compensatory Model allows for compensatory relationships between facets. A lowered SC in one area is compensated for by an enhanced view of self in another unrelated area. According to this view, students with realistically perceived weaknesses in one area tend to "beef up" their self-perceptions in another area. Winnie (1982) found that children in resource classes showed a consistent pattern of lower academic SC compared to either average or gifted students. However, they showed little difference from other students in non-academic areas of SC. Again, research to support this model is scant (Strein, 1993).

It is the purpose of this research to investigate the relationship of general or global SC and broad areas of subsuming SC domains with academic achievement. To assess SC, the Piers-Harris Children's Self-Concept Scale (PHSCS) was selected. To assess academic achievement, we choose the Texas Assessment of Academic Skills (TAAS) criterion-reference test for reading and math. A review of research databases and a query to the Texas Education Agency (1999) indicated that the literature is silent on the question of the ability of a generalized assessment of student self-concept to predict academic achievement on the TAAS. In addition to a correlation study of the PHSCS index with the Total Learning Index (TLI) of the TAAS, we independently correlated each of the six domains of the PHSCS with TAAS scores to ascertain whether certain domains of SC were higher predictors of academic achievement than others.

The Piers-Harris Children's Self-Concept Scale

The PHSCS is an 80-item, self-report questionnaire designed to assess how children and adolescents think about themselves. As an aid to more detailed clinical interpretation, the PHSCS provides six "cluster scales"–Behavior, Intellectual and School Status, Physical Appearance and Attributes, Anxiety, Popularity, and Happiness and Satisfaction. All cluster scales are scored in the direction of positive SC so that a high score on a particular cluster scale indicates a high level of assessed SC within that dimension (Piers, 1996).

Texas Assessment of Academic Skills

The Texas Assessment of Academic Skills (TAAS) is a compilation of various subject and grade-level tests used to measure student progress towards achieving mastery of the Texas Essential Knowledge and Skills (TEKS). The goal is to accurately measure achievement in the areas of reading, writing, mathematics, social studies, and science. The results are useful for providing a snapshot of individual student performance, an indicator of areas in which further diagnosis is warranted, and a technique for providing a level playing field for comparing the performance of campuses and districts.

Specific Research Questions

Three research questions were addressed in this study. First, does the Piers-Harris global self-concept scale correlate positively with eighth-grade student achievement, as measured by TAAS scores? Moderate positive correlations between achievement and GSC have been reported by a majority of the studies. We would expect $r = .25$ to be a threshold significance factor.

Second, few studies have attempted to examine the relationship between the individual cluster scores and achievement. The composite total score derived from the survey is only an estimate of the individual's generalized self-concept. SC is not a unitary dimension. Students can see themselves quite differently across different areas. However, the underlying assumption of the PHSCS is that various aspects of SC do relate both positively and negatively with each other. (Piers, 1984). We expected to find significant positive correlations between individual cluster scores measuring Intellectual Status, Behavior, and Anxiety scores, and moderate positive correlations for Physical Appearance, Happiness and Satisfaction, and Popularity.

Thirdly, is there a significant difference in mathematics achievement and reading achievement scores in relation to self-concept? Mathematics is viewed as a qualitative skill, with achievement dependent upon mastery of a chain of operations. Success requires that students attend to the lessons on a regular basis whereas lack of success can be due to stressful life events. Reading, on the other hand, is a quantitative skill; once the learner masters the pronunciation rules of decoding, frequent inattention may not be debilitating (Pungello, Kupersmidt, Burchinal, & Patterson, 1996). We expected that the correlations between SC and achievement would be weaker for mathematics achievement across the clusters.

Method

Participants

The eighth grade at a metropolitan suburban middle school in the Southeastern section of Texas was selected for study. The school population was 44% Caucasian, 51% Hispanic, and 5% Black, Native American, or Asian. There were 160 boys and 155 girls in the eighth grade. The general socioeconomic level of the area is working and middle class. In an effort

to eliminate Special Education students who were exempted from the grade-level TAAS tests, students were administered the PHSCS during regular English classes. All students in attendance were invited to participate by returning a signed parental permission letter. Eighty-eight students complied with the permission letter requirement.

Procedure

Students were administered the PHSCS during their Language Arts class by the author. Students were told to be as truthful as possible, to avoid socially acceptable responses, and that no one would read their answers, since only student identification numbers were being used. Directions were read aloud to the students prior to test administration. The students then completed the questions themselves, since Piers reported the language level in the PHSCS to be at a third-grade level. Administration of the TAAS tests were conducted in the usual manner in the regular classroom, as directed by the Texas Education Agency.

Results

Initial Examination of Items

Eighty-eight students responded with a signed permission letter from parent or guardian. Raw composite scores ranged from a low of 40 (2 surveys) to a high of 75 (one survey). Mean raw score was 60.03 with a standard deviation of 9.68. This compares to normative scores from PH of 56.2 and 14.3. Our data had higher means than PH on five of seven scales, but the standard deviation was consistently smaller, indicating more homogeneity among the subjects. Five surveys were excluded from the study because of inconsistent answers, suggesting that the five subjects did not answer truthfully.

Descriptive Statistics

Descriptive statistics are presented in Table 1. The means and standard deviations (SD) of the global scale *t*-scores and the six subdomains fell in the low to mid 50s and single digit SDs. Sample means and SDs for both the GSC and subdomains compared favorably with Pier's normative statistics for eighth-grade students.

Table 1
Descriptive Statistics and Piers-Harris Normed Data

	Sample Data		Piers-Harris	
Domain	Mean	SD	Mean	SD
TLI – Read	87.8	8.5		
TLI – Math	82.7	7.3		
Global Score	55.9	7.8	53.5	10.8
Behavior	53.4	9.1	49.7	11.2
Intelligence	52.4	9.9	48.9	11.6
Appearance	55.1	8.9	51.9	12.7
Anxiety	53.0	10.5	54.2	11.0
Popularity	53.8	8.7	51.4	10.6
Happiness	50.4	8.8	52.0	10.5

Data reported in *t*-scores.

Other research studies have yielded similar means and SIDs. For example, Huebner (1994) found a global score of 47.1 (12.7).

In order to investigate the relationship among the variables, Pearson product moment correlations were found employing the Statistical Package for Social Studies (SPSSX). GSC correlated significantly with the TAAS Reading mean ($r = .511$, $p < .01$) and moderately with the Math scores ($r = .301$, $p < .01$). The Intellectual Status subdomain correlated highly with Reading ($r = .655$, $p < .01$) and less so with Math ($r = .453$, $p < .01$). Most of the subdomain scores followed the trend of the GSC, with higher correlations found for Reading than for Math. One subscale did not behave consistently, and that was Behavior. The Behavior correlation coefficient for Reading was .324, while the Math coefficient was .354. The only subscale that yielded no significant correlation was Popularity with Math achievement.

Table 2 presents the correlations for all subdomains with Reading and Math, as well as correlations between the various subdomains. It is interesting to examine the correlations between the various subdomains with each other. For instance, as one would expect with eighth graders, Happiness and Satisfaction correlates highest with the two domains of Appearance and Anxiety. Behavior correlates most significantly with Intellectual Status, while Popularity correlates strongest with Appearance (see Tables 3, 4, 5, and 6).

Inferential Statistics

A one-way Analysis of Variance (ANOVA) was generated to test the null hypothesis. With Reading Achievement as the dependent variable, it was found that there was a significant regression of the six predictors onto the reading scores (F 6, 82 = 10.122, $p < .001$). Mathematics scores were also predicted by the six domains, but with less strength (F 6, 82 = 4.831, $p < .001$). Therefore we concluded that the null hypothesis was rejected and that the six attributes of global self-concept did predict both Reading achievement and Mathematics achievement.

Finally, a regression analysis was generated to examine the relative importance of each of the six attributes of GSC onto Reading and Math achievement. It was found that only Intellectual Status self-concept predicted Reading Achievement ($t = 4.957$, $p < .001$). There was a weaker regression coefficient for Intellectual Status and Mathematics ($t = 2.680$, $p < .01$).

Discussion

This study sought to investigate three questions. First, it was found that the Piers-Harris GSC scale does correlate significantly with both TAAS Reading scores and with TAAS Math scores and, in fact, statistics in this study yielded higher positive correlations than most other studies. Further, it was found that, consistent with other findings, academic or intellectual status self-concept correlated strongly with TAAS achievement scores. In comparison to our results, another study found the Intellectual status SC correlate to be .41 and the GSC correlate to be .29. (Padwal, 1984). Conversely, no other subdomain of the PHSCS offered a strong predictive input to academic success.

The second issue addressed in this study conclusively demonstrated that students do not see a strong correlation between their behavior and academics, between their appearance and academics, between their popularity and academics, and between their happiness and general state of satisfaction and academic success.

Thirdly, there was a significant difference in the predictive value of self-concept between reading and mathematics. The statistics indicated that the correlation between reading success and math success was $r = .665$, ($p < .001$), and this was consistent with the findings presented in this study. The ability of self-concept scores to predict math success is much weaker. Further research is needed to discover why this occurs.

Table 3
ANOVA – Reading

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2648.031	6	441.339	10.122	.000a
Residual	3313.607	76	43.600		
Total	5961.639	82			

a. Predictors: (Constant), HAPPY, POP, ANXI, BEHAVE, INTELL, APPEAR
b. Dependent Variable: TLIREAD

Table 4
Regression Coefficients – Reading

	Unstandardized Coefficients		Standard Coefficient		
Model	B	Std. Error	Beta	*t*	Sig.
(Constant)	55.298	6.203		8.915	.000
BEHAVE	4.986	.094	.053	.532	.596
INTELL	.502	.101	.579	4.957	.000
APPEAR	.116	.120	.121	.962	.339
ANXIETY	8.922	.089	.110	1.000	.320
POPULAR	-7.254	.109	-.074	-.666	.507
HAPPY	-7.228	.113	-.074	-.637	.526

a. Dependent Variable: TLIREAD

Table 5
ANOVA – Mathematics

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1200.279	6	200.047	4.831	.000a
Residual	3146.781	76	41.405		
Total	4347.060	82			

a. Predictors: (Constant), HAPPY, POP, ANXI, BEHAVE, INTELL, APPEAR
b. Dependent Variable: TLIMATH

Table 6
Regression Coefficients – Mathematics

	Unstandardized Coefficients		Standard Coefficient		
Model	B	Std. Error	Beta	*t*	Sig.
(Constant)	61.457	6.044		10.168	.000
BEHAVE	.123	.091	.154	1.346	.182
INTELL	.264	.099	.358	2.680	.009
APPEAR	-1.605	.117	-.020	-.137	.891
ANXIETY	.147	.087	.211	1.686	.096
POPULAR	-.138	.106	-.165	-1.300	.198
HAPPY	2.716	.111	.033	.246	.807

a. Dependent Variable: TLIMATH

Conclusions

This study replicated numerous other studies that found GSC to be a moderate predictor of academic achievement and especially in mathematics. The reader is cautioned to keep in mind the limitations to generalizations resulting from a nonrandomized sample. This study suggested several issues to examine. First, a longitudinal study could be launched to monitor the effects of high school on student self-concept. Secondly, this study did not seek to validate the PHSCS, so alternate measures of self-concept would be helpful. An inquiry into the relationship between academic success and student effort would be very interesting to assess student motivation. Many studies have confirmed the relationship between existing self-concept instruments and various measures of academic performance, but few have investigated the relationship between performance, measures of effort, and SC.

References

Huebner, E.S. (1994). *Conjoint analyses of the students' life satisfaction scale and the Piers-Harris Self-Concept Scale*. **Psychology in the Schools**, *31*(10), 273-277.

Padwal, R.S. (1984). **The relationship of self-concept to intelligence, anxiety, and academic achievement**. A report to the Saskatchewan School Trustees Association Research Center. No. 108, Regina, Saskatchewan.

Piers, E.V. (1996). **Piers-Harris Children's Self-Concept Scale: Revised manual**. Los Angeles, CA: Western Psychological Services.

Pungello, E.P., Kupersmidt, J.B., Burchinal, M., & Patterson, C. (1996). *Environmental risk factors and children's achievement from middle childhood to early adolescence*. **Developmental Psychology**, *32*(4), 755-767.

Rosenberg, M. (1965). **Society and adolescent self-image**. Princeton, NJ: Princeton University Press.

Shavelson, R.J., & Byrne, B.M. (1986). **On gender differences in the structure of adolescent self-concept**. Paper presented at the meeting of the American Educational Research Association Annual Meeting, San Francisco, CA.

Shavelson, R.J., & Bolus, R. (1982). *Self-concept: The interplay of theory and methods*. **Journal of Educational Psychology**, *74*(1), 3-17.

Strein, W. (1993). *Advances in research on academic self-concept: Implications for school psychology*. **School Psychology Review**, *22*(2), 273-284.

Texas Education Agency. (1999). **Student Assessment Division**, Chapters 1-9. On-line retrieval, www.tea.state.us/student.assessment/

Winnie, P. (1982). *Comparability of self-concept among learning disabled, normal, and gifted students*. **Journal of Learning Disabilities**, *15*(8), 470-475.