

Self-Concept and Learning Disabilities:
The Early Childhood Longitudinal Study Results

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Abstract

Using the ECLS-K national database, this study compared the self-concepts in reading, math, general academic (all-subjects), and peer areas for third-grade students with and without identified learning disabilities. Unlike most similar research on academic self-concept, students' measured achievement in reading and math was controlled, thereby effectively comparing students at similar levels of achievement. Correlations between achievement and self-concept were small for both LD and non-LD groups. When controlling for achievement, academic self-concepts were *not* lower for the students with LD. Similar to other studies, students with LD tended to statistically over-predict their achievement compared to the non-LD group. This study extends the Strein and Signor (2005) study that used similar methodology on a national database of high school sophomores.

Introduction

School psychologists and others in education have long been concerned about the self-concepts of students with learning disabilities. However, the research literature is mixed. Chapman's (1988) influential meta-analysis concluded that children with LD had lower general and academic self-concepts than did non-LD students. In addition, Chapman concluded that LD students in self-contained classes or resource rooms had *better* self-concepts than did similar students who were completely mainstreamed, leading some to support the value of special education placements. Similarly, Gans, Kenny and Ghany (2003), in a study of mostly Hispanic middle-school students, found that LD students had lower self-concepts in academic and behavior areas than did non-LD students, but did not differ on global self-concept. By contrast to the Chapman review, a more recent and more extensive meta-analysis of the relevant literature (Bear, Minke, & Manning, 2002) concluded that differences between LD and non-LD students in global self-concept and in domain-specific self-perceptions in regard to behavioral and social competence were so small as to be of no practical importance. Substantially higher academic self-concepts were found for non-LD students, as in the Gans et al. study and Chapman meta-analysis. However, Bear et al. concluded that educational setting (e.g., resource room, general education class with support) had limited, although statistically significant, effects.

While one might assume that lower academic self-concepts of LD students simply reflect realistic self-appraisals of academic achievement, some literature suggests exactly the reverse. Stone and May (2002) compared LD and non-LD students on a measure of academic self-concept, but also on students' predictions of their ability to perform a given academic task. While the LD students in this study did, in fact, post lower academic self-concept scores they *over-predicted* their actual performance compared to their non-LD peers, suggesting that LD students' academic self-concepts may actually be less accurate than those of non-LD students.

The original research cited above and most of the studies included in the Chapman (1988) and Bear et al. (2002) meta-analyses suffer from two shortcomings: (a) inadequate sample sizes that do not allow for exploration of important moderator variables such as gender or ethnicity, and (b) comparisons have typically been made between LD and "normal" non-LD students, i.e., students with average achievement levels. When studies included more than one non-LD contrast group, the Bear et al. meta-analysis calculated an effect size using the contrast group that was "most representative of the normal

population” (p. 409), e.g., random-sample vs. matched samples, or normal-achieving vs. low-achieving. Having an identified learning disability, versus having low achievement, but not being so-identified, results typically in an educational program that is differentiated in varying degrees of intensity from general education and also likely results in having some different aspects of self-identity (i.e., having a disability). So, to investigate the effects of “LD status” on students’ self-concepts the more informative comparison would be between LD and similarly-low-achieving non-LD students.

Using the Educational Longitudinal Study 2002 Strein and Signor (2005) analyzed data from 5284 non-LD and 382 LD high school sophomores. Similar to previous studies when achievement was *not* controlled for, LD students posted significantly lower scores in English, math and general academic self-concept. However, when controlling for achievement, these differences disappeared. Adjusted math self-concept scores were actually *higher* for students with LD, but the effect size of this difference was trivially small. Moderator effects for gender, ethnicity, and social class were either non-significant or trivially small. Correlations between the self-concept scales and their respective achievement measures indicated higher correlations for the non-LD than for the LD students and suggested that LD students tended to over-predict their achievement.

The present study extends the Strein and Signor (2005) study by applying similar analyses to the third-grade sample of the Early Childhood Longitudinal Study – Kindergarten Cohort (ECLS-K). The main research questions for this study were:

1. When controlling for measured achievement do LD 3rd graders possess differing levels of reading, math, and general academic self-concept when compared to a group of non-LD 3rd graders.
2. Does the degree of congruence between academic self-concepts in reading and math and actual achievement in these respective subjects, as measured by correlations between academic self-concept and tested achievement and grades, vary for the LD versus non-LD students.

Methodology

Data Samples

The ECLS-K dataset is comprised of a nationally stratified sample of 15,305 students who began kindergarten in Fall 1998. Data were collected in the fall and spring of their kindergarten and first-grade years and in the spring semester of 2002 when most students were completing 3rd grade. The project collected data from students, students’ general education and, where applicable, special education teachers, students’ parents, and school administrators, and from school records. Students who had been retained or who were in non-public schools were not included in the present study, reducing the pool to 10,739. Of these, 8,431 students (78.5%) had verified IEP status (i.e., IEP/No IEP) from their school records. Eliminating those students whose IEPs were for disabilities other than LD, resulted in a sample of 7,448 non-LD and 412 LD students.

Table 1 displays demographic information on the participants. As might be expected, males were disproportionately represented in the LD group ($\chi^2_{(df=1, 7860)} = 39.98$ $p < .001$). Ethnic differences were also significant ($\chi^2_{(df=4, 7850)} = 38.54$ $p < .001$) but only in terms of under-representation of Asian-American students in the LD group. A clear trend emerged with regard to social class; LD students were significantly over-represented in the lowest quintile of SES and under-represented in both of the two highest quintiles ($\chi^2_{(df=4, 6902)} = 44.17$ $p < .001$)

Data Analysis

Ordered regression analysis was the primary analytic tool used to investigate differences in self-concept between the LD and non-LD groups. Achievement measures were entered first, followed by achievement measures plus LD status. Reading and math self-concepts have respective achievement measures. For the all-subjects self-concept (general academic self-concept), *both* reading and math achievement measures were used. Analysis for the peer self-concept dependent variable did not attempt to control for any other variable.

Because the ECLS-K is a complex sample (versus a simple random sample), all analyses were weighted by the appropriate student weights included in the dataset. Although the standard SPSS package will accommodate such weighting and will produce correct parameter values (means, correlations, etc.), the standard package SPSS program does not adjust the standard errors, and resulting statistical tests, for the design effects of complex samples. Accordingly, the AM Software program (American Institutes for Research, 2005) was used to generate the *t* and *p* values reported below. Stratum, primary sampling unit, and student weight variables were used by the AM Software to make the necessary adjustments.

To compare congruence between self-concept and achievement for the two groups, simple Pearson correlations were generated from the weighted data. Analysis of residuals from regression analyses were also used to evaluate over- or under-prediction. Reported effect sizes are either Cohen's *d* based on calculated differences between means and their pooled standard deviations or estimates of *d* calculated from the partial Eta² statistic.

Table 1:
Sample Demographics

Characteristic	Non-LD		LD	
	N	%	N	%
<i>Gender</i>				
Male	3532	47.4	261	63.3
Female	3916	52.6	151	36.7
<i>Ethnicity</i>				
African-American	4233	56.8	264	64.1
Asian-American	941	12.7	49	11.9
European-American	1308	17.6	74	18.0
Latina/o	540	7.3	4	1.0
Other	426	5.7	21	5.1
<i>Socioeconomic Status</i>				
1 st Quintile	1019	15.6	91	25.0
2 nd Quintile	1284	19.6	85	23.4
3 rd Quintile	1328	20.3	85	23.4
4 th Quintile	1471	22.5	56	15.4
5 th Quintile	1436	22.0	47	12.9
<i>Total N</i>	7448	94.8	412	5.2

Note: Total N's within each characteristic vary due to missing data.

Results

Given the large sample sizes available from the ECLS-K dataset, focusing on effect sizes is much more informative than focusing on statistical significance; even trivially small effects will produce a p-value <.001 when statistical tests have degrees of freedom in the hundreds or thousands. Accordingly, the results will be reported primarily with an emphasis on effect size.

Differences in Self-Concept

When *not* controlling for achievement fewer differences were found compared to most previous research. No significant differences between LD and non-LD students were found for math ($t_{(7826)} = -0.437$; $p = .663$) self-concept. A small effect size ($ES = -.17$) was found for general (all-subjects) academic self-concept ($t_{(7826)} = -2.752$; $p = .006$). Only reading self-concept produced a medium effect size ($ES = -.35$) favoring the non-LD students. Peer self-concept also produced no significant group differences ($t_{(7826)} = -0.457$; $p = .648$). These ES's were substantially smaller than for the corresponding ES's in the Strein and Signor (2005) study or for the mean ES's for within-study contrasts reported in the Bear et al. (2002) meta-analysis.

When respective achievement was controlled for, group differences in reading, math, and general academic self-concepts were either non-significant or trivially small. No significant differences were found on reading self-concept ($t_{(7825)} = -1.100$; $p = .272$). Differences in general academic self-concept were significant ($t_{(7824)} = -1.959$) but trivial ($ES = -.06$). As was true in the Strein and Signor (2005) study, when adjusted for actual achievement LD students had significantly ($t_{(7825)} = 2.031$; $p = .043$) *higher* math self-concepts than did non-LD students. Although intriguing, especially since replicated on two different samples at two very different age levels, the effect is trivially small ($ES = .06$). Unadjusted means and standard deviations, and adjusted means are displayed in Table 2. Given non-significant or trivially small differences when controlling for achievement and the trivially small moderator effects found by Strein and Signor, the present study did not analyze possible moderator effects.

Table 2:
Descriptive Statistics for Self-Concept Comparisons

Self-Concept/Interest Measure	Non-LD (N = 7431)		LD (N = 397)		Comparison	
	Mean	S.D.	Mean	S.D.	Effect Size	p
Unadjusted						
Reading	3.28	0.65	3.05	0.78	-.35	<.001
Math	3.15	0.79	3.12	0.83	---	.663
All Subjects	2.91	0.65	2.80	0.69	-.17	.006
Peer	3.02	0.64	3.00	0.74	---	.648
Adjusted for Achievement						
Reading	3.27		3.22		---	.272
Math	3.14		3.25		.06	.043
All Subjects	2.91		2.82		-.06	.051

Congruence of Self-Concept and Achievement

The relationships between self-concept of ability and tested achievement produced a complex pattern of similarities and differences for the LD and non-LD groups. Across *both* groups and all comparisons, correlations were small. All correlations were less than .20 . The relationship between math self-concept and math achievement was similar for both the LD and non-LD students. In reading, the subject area for which most students with learning disabilities are being served, the relationship between achievement and self-concept was much stronger for the non-LD than for the LD group. In fact, the correlation for the LD group was not significant at the .05 level and the correlation itself was trivially small. Frequency analysis of standardized residuals resulting from the respective regression equations indicated that the self-concepts of students with LD tended to over-predict their actual achievement levels, particularly in math. Although the magnitude of the relationship between self-concept and achievement for this sample of third graders was generally lower than that found by Strein and Signor for the high school sophomores, the *patterns* are very similar, i.e., that the self-concept/achievement relationship is stronger for the LD than for the non-LD group and LD students tend to over-predict their achievement. An intriguing finding, not found by Strein and Signor, was that the correlations between both reading and math achievement and “all subjects” self-concept was *negative*. However, given the magnitude of these correlations (r 's = -.188, -.189), this finding should not be over-interpreted.

Table 3
Correlations between Self-Concept and Achievement Measures

Self-Concept	Reading Achievement				Math Achievement			
	Non-LD		LD		Non-LD		LD	
	N	r	N	r	N	r	N	r
Reading	7426	.196*	378	.049	---	---	---	---
Math	---	---	---	---	7429	.164*	396	.123*
All Subjects	7426	.039*	378	-.188*	7429	.057*	396	-.189*

Note. * = $p < .01$.

Discussion

The literature on self-concept of students with learning disabilities consistently finds that students with LD hold lower self-concepts in academic areas than do non-LD students (Bear et al., 2002). This simple comparison was replicated in this study using a large and reasonably representative sample of these two groups. However, such analyses typically compare LD students, almost all of whom are low-achieving by definition, with a very heterogeneous group of non-LD students. Hence, these comparisons tell us little about whether these lowered perceptions stem from “having” a learning disability (or being so-labeled or having the educational modifications that typically accompany being so-identified) or whether these perceptions are related to low-achievement and not to LD status, per se. The results of this study and those of the Strein and Signor (2005) study of high school sophomores, which found either non-existent or small and counter-intuitive differences in self-perceptions when controlling for achievement suggest that LD status, per se, does not affect self-concept in academic areas. This conclusion strongly supports Bear et al.’s position that it is questionable to provide interventions to enhance self-concept with students with LD, “...solely on the basis of the student’s disability category” (p. 419). The counter-intuitive finding that *adjusted* mean math self-concept scores were *higher* for students with LD than for non-LD students is difficult to interpret. Given that mean

reading and math achievement scores of the students with LD were nearly identical, differences in actual achievement can not account for this effect. Perhaps the special education programs for students with LD focused more strongly on reading (the most common reason for referral for LD placement), such that the student's self-perceptions of their math competence were higher because of an internal comparison against a focus on their reading difficulties.

Similar to Stone and May (2002) this study found that students with LD tended to *over-predict* their achievement, that is, their predicted achievement scores based on their self-concepts were *higher* than their actual achievement. This finding may be interpreted in two ways. A pessimistic interpretation would focus on these sophomores as having an "inaccurate" view of themselves and, therefore, potentially making less-than-optimal decisions about educational or occupational pursuits. A more positive interpretation is that students who are identified with LD have optimistic predictions of their own abilities that will allow them to strive for continued academic progress *even though* such self-predictions might be probabilistically less valid. An important consideration regarding the results on congruence between achievement and academic self-concept is that the comparisons were between students with LD and non-LD students without any control for level of achievement. Unlike the analyses of levels of self-concept, these results may reflect differences in prediction for low-achieving versus average-achieving students rather than comparisons around LD status.

References

American Institutes for Research & Cohen, J. (2005). *AM statistical software, version 0.06.03 beta*. Washington, DC: authors.

Bear, G. G., Minke, K. M., & Manning, M. A. (2002). Self-concept of students with learning disabilities: A meta-analysis. *School Psychology Review, 31*, 405-427.

Chapman, J. W. (1988). Learning disabled children's self-concepts. *Review of Educational Research, 58*, 347-371.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.

Gans, A. M., Kenny, M. C., & Ghany, D. L. (2003). Comparing the self-concept of students with and without learning disabilities. *Journal of Learning Disabilities, 36*, 287-295.

National Center for Education Statistics (2004). *Education longitudinal study of 2002: base year data file user's manual*. Washington, DC: author.

Stone, C. A., & May, A. L. (2002). The accuracy of academic self-evaluations in adolescents with learning disabilities. *Journal of Learning Disabilities, 35*, 370-383.

Strein, W., & Signor, S. (2005). *Self-concepts of adolescents with learning disabilities: A large-scale database study*. Paper (poster session) presented at the Annual Convention of the American Psychological Association, Washington, August 20, 2005.