Comparing Measure of Academic Progress (MAP) and Piers-Harris 2 Scores of Students with Emotional and Behavioral Disorders

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Abstract

In this quantitative, archival study, academic achievement and self-concept scores were compared for middle-school students with EBD based on whether the students had been placed into a self-contained learning environment (SCLE) or a mainstreamed least restrictive environment (MLRE). Academic achievement scores and self-concept scores for 2007 were compared between the two groups (n = 70 for each group), with 2005 scores used as a baseline. The findings of the study demonstrated that when students with EBDs are given an opportunity with highly skilled professional staff members trained in both mental health therapy and special education, improvements are possible. In addition, this study enhanced both the broken-glass and Social, Academic, and Cognitive (SAC) theories by demonstrating the potential of integrating academic skills with emotional and behavioral support. Additional research is needed to investigate more intensive and innovative strategies designed to help students with EBDs succeed academically and socially.

Comparing Measure of Academic Progress (MAP) and Piers-Harris 2 Scores of Students with Emotional and Behavioral Disorders

Students with an emotional and behavioral disorder (EBD) are at risk for negative outcomes in academic, social, and behavioral domains (Clark, 2007; Hagner et al., 2008). These behavioral patterns also have long-term effects. Many individuals with an EBD have difficulties adjusting to life, and these difficulties become adult mental health issues (Epstein, Atkins, Cullinan, Kutash, & Weaver, 2008). Most research in the area of EBD has involved measuring and analyzing students with EBD in learning environments not taught by qualified personnel (Prather-Jones, 2011). Issues that affect academic achievement and self-concept in the learning environment of students with EBD include learning problems, unfair educational placement, differences in diagnosis requirements, the presence of unqualified professionals, inadequate educational placement procedures, and behavioral limitations that are uncontrollable (Boreson, 2006; Collaborative for Academic, Social, and Emotional Learning 2007; Rutherford, Quinn, & Mathur, 2007). Students with an EBD present challenges in various learning environments. More than 52% of students with an EBD have dropped out of high school during the first 2 years (National Center for Special Education Research, 2007; National Longitudinal Transition, 2007). For this study, both the broken-glass and Social, Academic, and Cognitive (SAC) theories were used for the EBD students that were educated in the SCLE and the MLRE.

Broken Glass and Social, Academic and Cognitive Theories

The broken-glass theory was first developed by Chisolm for students with an EBD that were educated in the SCLE. The theoretical foundation of the broken-glass theory is a synthesis of ideas from several theorists, as well as of research from the Collaborative for Academic, Social, and Emotional Learning (2007) and the William Glasser Institute (2007). The broken- glass

theory focuses on allowing the teacher to solve problems concerning dysfunctional emotions, behaviors, and cognitions through a goal-oriented, systematic procedure that focuses on the present and takes away from academic instructional time (Chisolm, 2008). The broken- glass theory is a long term-plan/program and is based on reality therapy, which is a form of therapy that enables an individual to examine what he or she really wants, accept who he or she is, and accepts responsibility for his or her own actions (William Glasser Institute, 2007).

Chisolm's Social, Academic, and Cognitive (SAC) theory was developed as an extension of the broken-glass theory. Chisolm's Social, Academic, and Cognitive theory of Students with an Emotional and Behavioral Disorder addresses the short-term/ daily need of EBD students. This particular theory allows the teacher to develop and implement techniques to foster social, academic, and cognitive skills (Chisolm, 2013). SAC is a short-term strategy that is used to assist the student with an EBD in understanding how thoughts, emotions, and behaviors are connected and affect one another. Both of Chisolm's theories provide a learning environment with optimal academic, emotional, and behavioral support for the student with an EBD. The broken-glass theory focuses on the long-term academic, emotional and behavioral problems. The SAC provides short-term strategies/techniques in understanding and coping with specific actions, thoughts, emotions, and behaviors that are connected and affect one another; that interfere with reaching long-term goals of the broken-glass theory.

The academic, emotional, and behavioral components of Chisolm's theories are instructed by highly qualified special education teachers, who have additional training, certification or licensing in a particular mental health discipline. The academic, emotional, and behavioral components of Chisolm's theories are also theorized to work on three academic levels. The first academic level occurs when the academic, emotional and behavioral instruction is mainly led by the educator. The second academic level occurs when the academic, emotional and behavioral instruction is led by both the student and teacher. The final academic level occurs when the academic, emotional and behavioral instruction is mainly led by the student.

The essential teaching technique used by the teacher is called, "teaching and learning through the process". This process is simply, teaching and learning, correcting emotional and behavioral responses as events naturally take place for each individual child. As a group, the teacher introduces and models appropriate behaviors. The Introduction and modeling of appropriate behaviors is only completed a few times a week, this is done to introduce the concept as a group to the students. However, intense instruction is given daily and individually as the teacher regularly interacts with each individual student and notices problem behaviors, triggers, consequences, settings, events, or decisions, which are taking place that might or are causing negative or positive behavioral reactions. As a result, the teacher is teaching and learning through the process, with the student, through the natural process of the student, as behaviors take place, and replacing the negative behaviors with positive behaviors.

Significance of the Study

This study was unique in that both learning environments examined had exceptional academic, emotional, and behavioral support from highly qualified personnel. The school district in which the research occurred offered two types of learning environments (SCLE and MLRE) for middle school students with an EBD. The two special education teachers who taught the two groups

were highly qualified mental-health professionals certified in teaching students with an EBD. The special education teacher who taught the SCLE was a trained cognitive behavioral therapist, and the special education teacher who taught in the MLRE was a Licensed Master Social Worker. The special education teachers also had instructional aides who were highly qualified and trained in handling students with an EBD.

Purpose

The purpose of this study was to investigate differences in academic achievement and self-concept scores among students with an EBD based on the type of learning environment in which they were placed (SCLE vs. MLRE).

Setting

This study took place in two urban middle schools in South Carolina. The selection of the participants was based upon enrollment in the two self-contained programs for children with an EBD. Both middle schools serviced students with an EBD in Grades 6, 7, and 8. In the two schools, the same measures were used for academic achievement and self-concept, and both schools provided SCLE and MLRE learning environments for students with an EBD in 2005 and 2007.

Participants

The samples for this study consisted of archival records, rather than live participants. Archival records represented 140 students (70 per group) in Grades 6, 7, and 8 educated and associated with the EBD learning environment. Data were gathered from two middle schools located within an urban school district in South Carolina. Both middle schools were represented equally among the 140 participants.

The sample used for this study was a purposive, nonprobability sample, rather than a sample selected with a randomized selection process. Subjects in a nonprobability sample are selected on the basis of their accessibility or by the purposive personal judgment of the researcher (Vogt, 2007). A post hoc power analysis was conducted to determine the actual power of the statistical tests conducted for this study (Faul, Erdfelder, Buchner, & Lang, 2009). For a two-tailed, independent-samples *t* test, a medium effect size $d = 0.5$ was assumed, with an alpha significance level of .05 and a sample size of 140 (70 per group). The achieved power of the test was 83.6%.

In the selected school district, there were two schools with EBD programs. Students were eligible for the program if their place of residence was zoned for the middle school. The selected schools had similar demographics in terms of EBD classification and the number of students enrolled in the EBD program. In addition, the same assessments for both self-concept and academic achievement were used in both schools. Data were compared for the school year ending 2007, and 2005 data for the same students were used as baseline scores for comparison.

Materials/Instruments

The two testing instruments used for this study were the Piers-Harris 2 and the Measure of Academic Progress (MAP). The Piers-Harris 2 was a measure of self-concept, and the MAP was a measure of the academic achievement of the participants. Following is a description of each of the instruments used.

Piers-Harris 2.

The Piers-Harris Children's Self-Concept Scale is one of the most widely used measures of psychological health among children and adolescents because the scale quickly identifies youngsters who need further testing or treatment in the clinical or educational setting (Manning, 2007). The Piers-Harris 2 was designed to assess the perceptions of children or adolescents regarding how they feel about themselves and how they examine their consideration of another person's perspectives of themselves (Robinson, 2007).

The Piers-Harris 2 assesses self-concept in individuals aged 7 to 18 (Piers & Herzberg, 2002). The self-concept scale is composed of 60 items organized into six subscales: (a) physical appearance and attributes (11 items), (b) intellectual and school status (16 items), (c) happiness and satisfaction (10 items), (d) freedom from anxiety (14 items), (e) behavior adjustment (14 items), and (f) popularity (12 items). The total self-concept score are computed from 25 items related to positive self-concept, with a raw score in the range of 0 to 60 (Piers & Herzberg, 2002). Total self-concept ranges are: High (>60), Average (40 to 59), and Low (<39). The 25 items indicating positive self-concept were selected from all six subscales. Examples of positive self-concept responses are; "I am a happy person", "I am smart", and "I am a good person".

Test items on the Piers-Harris 2 are simple descriptive statements, written at a second-grade reading level and requiring yes-or-no responses (Piers & Herzberg, 2002). The yes-or-no responses include 25 positively and 35 negatively phrased items presented as first-person declarative statements (Puckett, 2008). A total score ranges from 0 to 60 and reflects overall self-concept. A low range (less than 39) indicates an individual with serious doubts about his or her own self-worth (Piers & Herzberg, 2002). An average range (40 to 50) indicates a balanced acknowledgement of both negative and positive aspects of self. A high range (60 or above) indicates a strong general self-appraisal. The *T* scores for the scale and all subscales were normed with a mean of 50 (*SD* = 10), with a normal range between 40 and 60 for the total score (Piers & Herzberg, 2002).

The basis for the reliability of the Piers-Harris 2 was a renormed test-retest for the norm groups of third, sixth, and tenth grade students. The test-retest was conducted with a nationally representative sample of 1,387 students aged 7 to 18, recruited from school districts throughout the United States. The reliability scores were .72 for third grade, .71 for sixth grade, and .72 for tenth grade (Piers & Herzberg, 2002). The internal consistency of the Piers-Harris 2 was .91 for the total score and .74 to .81 for the six subdomain scores (Piers & Herzberg, 2002).

Measure of Academic Progress (MAP).

The reliability of the MAP was based upon a test-retest and a type of parallel forms reliability. Traditionally, a span of 2 to 3 weeks has been used to separate the two test administrations. As a larger time spread of 6 to 8 weeks was used between tests for the current study, Pearson coefficients of reliability below .80 were not considered unreasonable (Northwest Evaluation Association, 2010). Pearson coefficients for test-retest reliability of the MAP ranged from .84 to .94, demonstrating the reliability of the MAP (Northwest Evaluation Association, 2010).

The MAP is a computer-based assessment system based on a Rausch Unit (RIT) scale that measures mathematics, reading, and language usage. A RIT scale is a curriculum scale based on the use of the difficulty values of individual items to estimate student achievement (Northwest Evaluation Association, 2010). The use of the RIT provides educators with better opportunities to address academic issues in a timely manner by relating the numbers on the RIT scale directly to the difficulty of items on the tests (Northwest Evaluation Association, 2010).

A RIT scale is a curriculum scale based on the use of individual item difficulty values to estimate student achievement (Northwest Evaluation Association, 2010). The RIT scale is also an equal interval scale, always showing consistent measurement (Cohen & Spenciner, 2007). For example, a student who improved from 165 to 170 shows the same amount of instructional growth as a student who improved from a 280 to 285. Because the RIT score is consistent, it accurately measures the student's growth over a period of time (Northwest Evaluation Association, 2010). RIT scores differ based upon the area of assessment.

The MAP was designed to adapt to the responses of the user as the user proceeded through the test. If a student answered a question correctly, the test presented a more challenging question. If the student missed the question, a simpler question followed (Northwest Evaluation Association, 2010). Test questions came from a growth research database built on accumulated test questions. To account for students who put forth little effort during the test, a monitoring system was built into the test to estimate the shortest potential completion time. If the student completed the test in less than the estimated time, the system would flag an error and not register the test results.

Research Questions

Research Question 1.
To what extent, if any, is there a difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD?

$H1_0$. There is no significant difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

$H1_a$. There is a significant difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

Research Question 2.
To what extent, if any, is there a difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD?

$H2_0$. There is no significant difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

$H2_a$. There is a significant difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

Results

To determine whether the total self-concept score and academic achievement score were normally distributed, P-P plots were generated. For academic achievement, distributions were strongly normal. For total self-concept, the residuals showed a minimal departure from normality, but having at least 30 participants in an independent samples *t* test makes the test robust against minor violations of normality (Pallant, 2010). Parametric statistics were therefore used to analyze both research questions. Levene's test showed that variances were equal for academic achievement scores but not for total self-concept scores. However, the results of the independent samples *t* tests for total self-concept were unchanged when equal variances were not assumed. An alpha level of .05 was set for all hypotheses tests.

Research Question Q1.

To what extent, if any, is there a difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD?

$H1_0$. There is no significant difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

$H1_a$. There is a significant difference in academic achievement, as measured with the MAP, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

Independent-samples *t* tests were performed to compute the differences in academic achievement scores based on the learning environment (MLRE vs. SCLE) for 2007. The results are reported in Table 1. Composite scores for academic achievement in 2007 were significantly different for the two groups, $t(138) = 2.65$, $p = .009$, with the MLRE group having a higher mean score. The null hypothesis $H1_0$ was rejected, and there was support for the alternative hypothesis $H1_a$. The composite mean score was also higher in 2007 for the MLRE group in mathematics, $t(138) = 1.68$, $p = .008$, and in language arts, $t(138) = 2.16$, $p = .03$. There were no significant differences in baseline scores for 2005 for any academic measures.

Table 1
Academic Test Scores, Between-Group Differences

Measure	Year	Mean difference	*t* (138)	*p*	95% CI of the difference
Mathematics	2005	3.34	1.30	.20	[-1.73, 8.42]
	2007	5.93	1.68	<.01	[1.55, 10.30]
Reading	2005	1.60	0.54	.59	[-4.21, 7.41]
	2007	3.37	1.40	.16	[-1.40, 8.14]
Language arts	2005	3.74	1.47	.14	[-1.30, 8.78]
	2007	4.91	2.16	.03	[0.41, 9.42]
Composite score	2005	8.69	1.39	.17	[-3.37, 21.04]
	2007	14.21	2.65	<.01	[3.61, 24.82]

Note. $n = 140$. CI = confidence interval.

Split-plot analyses of variance (ANOVA), also termed SPANOVAs, were performed to evaluate within-group longitudinal differences and Year x Class Type interactions for academic achievement scores. All within-group differences were significant, indicating improvement in all academic achievement scores between 2005 and 2007. Table 2 shows the within-group differences for academic achievement for the MLRE, and Table 3 shows the differences for the SCLE. The differences in composite academic scores for the Year x Class Type interaction were not significant, Wilks' Lambda = .98, F (1, 138) = 3.46, $p = .06$.

Table 2
Academic Test Scores, Within-Group Longitudinal Comparisons, Mainstream Least Restricted Environment

	M (SD)					
Measure	2005	2007	Difference	*t*(69)	*p*	95% CI of the difference
Mathematics	190.51 (16.03)	199.64 (14.07)	9.13 (8.42)	9.07	< .001	[7.12, 11.14]
Reading	186.66 (18.91)	194.40 (15.45)	7.74 (9.66)	6.70	< .001	[5.44, 10.05]

Language arts	191.50 (16.22)	199.40 (14.79)	7.90 (7.34)	9.00	< .001	[6.15, 9.65]
Composite score	568.67 (38.67)	593.44 (34.67)	24.77 (15.15)	13.68	< .001	[21.16, 28.38]

Note. $n = 70$. CI = confidence interval.

Table 3
Academic Test Scores, Within-Group Longitudinal Comparisons, Self-Contained Learning Environment

	M (SD)					
Measure	2005	2007	Difference	*t*(69)	*p*	95% CI of the difference
Mathematics	118.17 (14.30)	193.71 (12.04)	6.54 (11.07)	4.95	< .001	[3.90, 9.18]
Reading	185.06 (15.71)	191.03 (12.97)	5.97 (10.86)	4.60	< .001	[3.38, 8.56]
Language arts	187.76 (13.87)	194.49 (12.01)	6.73 (7.82)	7.20	< .001	[4.86, 8.59]
Composite score	559.99 (35.16)	579.23 (28.47)	19.24 (19.73)	8.16	< .001	[14.54, 23.95]

Note. $n = 70$. CI = confidence interval.

Research Question Q2.
To what extent, if any, is there a difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD?

$H2_0$. There is no significant difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

$H2_a$. There is a significant difference in self-concept, as measured with the Piers-Harris 2, between students with EBD educated in a SCLE and students with EBD educated in a MLRE, among middle school students with EBD.

Independent-samples *t* tests were performed to compute the differences in self-concept scores based on the learning environment (MLRE vs. SCLE) for 2007. The results are reported in

Table 4. Among middle school students with an EBD, there was no significant difference in overall mean self-concept scores between MLRE students and SCLE students, $t(138) = 0.57$, $p = .57$. The null hypothesis $H2_0$ was not rejected, and the alternative hypothesis $H2_a$ was not supported. There were no significant differences in scores for any of the self-concept subscales for 2007. The only significant difference in baseline scores for 2005 was for freedom from anxiety, $t(138) = 2.01$, $p = .046$.

Table 4
Self-Concept Scores, Between-Group Differences

Measure	Year	Mean difference	*t* (138)	*p*	95% CI of the difference
Behavioral adjustment	2005	0.41	0.31	.76	[-2.24, 3.07]
	2007	1.33	0.85	.40	[-1.76, 4.42]
Intellectual and school status	2005	0.40	0.25	.81	[-2.81, 3.61]
	2007	1.21	0.75	.45	[-1.98, 4.41]
Physical appearance and attributes	2005	-0.34	-0.17	.87	[-4.34, 3.66]
	2007	1.23	0.60	.55	[-2.81, 5.27]
Freedom from anxiety	2005	2.94	2.01	<.05	[0.47, 5.84]
	2007	2.46	1.76	.08	[-0.30, 5.22]
Popularity	2005	-0.50	-0.27	.78	[-4.12, 3.12]
	2007	0.47	0.23	.82	[-3.54, 4.48]
Happiness and satisfaction	2005	-0.23	-0.15	.88	[-3.16, 2.70]
	2007	1.04	0.68	.50	[-1.98, 4.07]
Overall score	2005	-0.67	-0.44	.66	[-3.76, 2.39]
	2007	0.77	0.57	.57	[-1.90, 3.45]

Note. $n = 140$. CI = confidence interval.

SPANOVAs were performed to evaluate within-group longitudinal differences and Year x Class Type interactions for self-concept scores. All within-group differences were significant, $p < .01$, indicating improvement in all self-concept scores between 2005 and 2007. Table 5 shows the within-group differences for self-concept for the MLRE, and Table 6 shows the differences for

the SCLE. The differences in overall self-concept scores for the Year x Class Type interaction were not significant, Wilks' Lambda = .99, F (1, 138) = 1.04, p = .31.

Table 5
Self-Concept Test Scores, Within-Group Longitudinal Comparisons, Mainstream Least Restricted Environment

	M (SD)					
Measure	2005	2007	Difference	*t* (69)	*p*	95% CI of the difference
Behavioral adjustment	42.03 (8.53)	46.61 (9.58)	4.59 (7.79)	4.92	< .001	[2.73, 6.44]
Intellectual and school status	40.11 (10.07)	44.96 (9.32)	4.84 (7.50)	5.40	< .001	[3.05, 6.63]
Physical appearance and attributes	43.10 (12.94)	49.56 (13.03)	6.46 (10.47)	5.16	< .001	[3.96, 8.95]
Freedom from anxiety	47.13 (8.42)	50.83 (8.28)	3.70 (11.36)	2.73	.008	[0.99, 6.41]
Popularity	40.49 (11.59)	46.21 (12.68)	5.73 (10.57)	4.54	< .001	[3.21, 8.25]
Happiness and satisfaction	40.46 (9.00)	45.11 (9.65)	4.66 (7.27)	5.36	< .001	[2.92, 6.39]
Overall score	41.04 (9.78)	49.37 (8.77)	8.33 (9.16)	7.61	< .001	[6.14, 10.51]

Note. n = 70. CI = confidence interval.

Table 6
Self-Concept Test Scores, Within-Group Longitudinal Comparisons, Self-Contained Learning Environment

	M (SD)					
Measure	2005	2007	Difference	*t* (69)	*p*	95% CI of the difference

Behavioral adjustment	41.61 (7.34)	45.29 (8.93)	3.67 (8.17)	3.76	< .001	[1.72, 5.62]
Intellectual and school status	39.71 (9.12)	43.74 (9.78)	4.03 (8.80)	3.83	< .001	[1.93, 6.13]
Physical appearance and attributes	43.44 (10.91)	48.33 (11.05)	4.89 (10.30)	3.97	< .001	[2.43, 7.34]
Freedom from anxiety	44.19 (8.90)	48.37 (8.23)	4.19 (11.41)	3.07	.003	[1.46, 6.91]
Popularity	40.99 (10.05)	45.74 (11.24)	4.76 (9.79)	4.07	< .001	[2.42, 7.09]
Happiness and satisfaction	40.69 (8.53)	44.07 (8.41)	3.39 (8.20)	3.45	.001	[1.43, 5.34]
Overall score	41.73 (8.56)	48.60 (7.15)	6.87 (7.64)	7.53	< .001	[5.05, 8.69]

Note. $n = 70$. CI = confidence interval.

Discussions

This quantitative study was an investigation of academic achievement and self-concept scores for two groups of students with an EBD based on the type of learning environment in which they were placed (SCLE vs. MLRE). The academic, emotional, and behavioral supports in these environments had been designed to exceed by far the basic federal requirements for teaching students with EBDs (Prather-Jones, 2011; South Carolina Department of Education, 2007). In this section, the findings of the study are evaluated.

Academic achievement.

The findings of this study showed that when group main effects were examined, the composite academic score for 2007 was significantly higher for the MLRE group than for the SCLE group, $p = .009$. When examined in terms of the separate components (mathematics, reading, and language arts), scores for mathematics and language arts were significantly higher in 2007 for the MLRE group as well. No baseline between-group differences were significant. Within-group analyses showed that all academic scores improved between 2005 and 2007 for both groups, $p < .001$. These findings were in contrast to previous literature, according to which there is a lack of improvement in academic achievement for this population (Mattison, 2011).

The MLRE group generally consisted of students with less severe emotional and behavioral problems compared to the SCLE group (Kaufman et al., 2008). Thus, one interpretation of the findings is that students in the MLRE group may have focused more on academic issues than the other students did, and academic scores may have been higher as a result. In previous research,

findings regarding academic achievement and self-concept among students with an EBD have been mixed (Wiley, Siperstein, Forness, & Brigham, 2010). Students in both MLREs and SCLEs have demonstrated broad academic and social deficits (Gage et al., 2010). Overall, these individuals have unstable and inconsistent academic and social outcomes (Rutherford et al., 2007). A cross-sectional study of kindergarten through 12th grade students with an EBD (Nelson, 2004) showed that achievement deficits were higher and more pronounced among adolescents than among the younger children.

Studies of students with an EBD have consistently shown little to no improvement over time in academic functioning (Wiley et al., 2010). Students with an EBD did not improve in academic skills over the course of an academic year, regardless of the type of learning environment (Mattison, 2011). In some cases, the students fell farther behind in the academic, social, and behavioral domains (Trout et al., 2008). However, in this study, within-group longitudinal improvements were found for all academic scores.

Although prior research is consistent regarding a lack of improvement for students with an EBD, the nature and extent of the problem has varied among different studies (Lane et al., 2008). In terms of academic achievement, findings differ regarding whether deficits in different subject areas remain stable or worsen over time. Over a 7-year period, the percentage of students in this population reading below grade level increased, whereas the percentage performing below grade level in mathematics remained constant (Mattison, 2011). A cross-sectional study of students with an EBD in kindergarten through 12th grade (Nelson et al., 2004) demonstrated no significant growth in reading or written language over time, and deficits in mathematics increased. A meta-analysis of academic achievement among students with an EBD (Reid et al., 2004) showed no differences by age in any subject area, suggesting that academic deficits remained stable over time.

The wide variability in academic progress among students with severe deficits in academic achievement may be related to the contextual differences in the types of learning environments in which students with an EBD are educated (Carr-George et al., 2009; Wiley et al., 2010). In national longitudinal studies, environments for students with an EBD in particular have been found to be significantly under resourced (Wiley et al., 2010). Data from two nationally representative samples showed that students with an EBD spent less time in general education classrooms, were likely to have teachers who felt unprepared to work with them, and were unlikely to receive needed academic or mental health supports (Carr-George et al., 2010). In contrast to previous research, the environment examined in this study was marked by an unusually high level of professional expertise. These differences in quality may explain both the longitudinal improvements for both groups and the between-group differences, neither of which were found in other studies.

Self-concept.

There were no significant between-group differences in self-concept scores except for the baseline difference in freedom from anxiety, $p = .046$. However, self-concept did improve between 2005 and 2007 for all aspects studied, $p < .01$. This finding was in contrast to other studies (Parker, 2010; Rutherford et al., 2007) that showed no improvement of self-concept over time for students with EBD. The finding of within-group longitudinal differences has

contributed to the broken glass theory. The results showed that a special-needs program marked by an unusually high level of expertise was able to create improvement in the self-concept of adolescents with an EBD.

According to theories of self-concept, attributes of self-concept include control; acceptance; responsibility; and an understanding of self in terms of social characteristics or abilities, physical appearance, body image, and inner thinking (Bandura, 1997; Bandura et al., 2001; Hadley et al., 2008). In the current study, there was not a significant difference in self-concept scores between the two groups (SCLE vs. MLRE). Because many students with an EBD lack social competence and display erratic behaviors, some researchers (e.g., Parker, 2010) have assumed that members of this population perform better socially and have higher levels of self-concept in more restrictive learning environments. However, the findings of the current study confirm the notion, suggested by other researchers (Webber & Plotts, 2008), that many students with EBD do not engage in enough positive social interaction with peers to improve positive perceptions of the self.

Overall self-concept scores for both the MLRE and SCLE groups in this study were in the low-average range for the instrument used (Piers & Herzberg, 2012). Scores in the average range usually represent a balanced self-evaluation, with acknowledgement of both positive and negative aspects of the self (Piers & Herzberg, 2009). A low-average range indicates that on the balance, the self-evaluation of the participants was negative (Piers & Herzberg, 2009).

Students with an EBD typically exhibit lower levels of self-concept than the norm (Montague et al., 2007; Wiley et al., 2010). Students with an EBD would be predicted to have low levels of self-concept. These students typically perceive neutral social interactions as being hostile or negative (Robinson, 2007). A study of self-concept trajectories of students with an EBD (Wei et al., 2012) showed lower levels of social self-concept and self-image compared to students with other disabilities (Wei et al., 2012).

Contribution to Knowledge

The comparison of data from students with an EBD from two different settings in this study was a contribution to knowledge. Researchers have primarily compared students with an EBD to nondisabled peers (Rutherford et al., 2007; Vannest et al., 2009). Thus, standards for success are based upon the achievements of students without disabilities (Rutherford et al., 2007). Limited attention has been given to comparing students with an EBD with other students from this population in different learning environments to determine the best environment for success (Kaufman et al., 2008).

In comparisons of students with an EBD with other peers with disabilities, the educators in the learning environments were not prepared to handle the various emotional and behavioral needs of this population (Prather-Jones, 2011). In contrast, the academic, emotional, and behavioral support from highly qualified personnel for the students in this study was exceptional in the field of special education. The school district in which the research occurred offered two types of learning environments for middle school students with an EBD. The two special education teachers who taught the two groups were highly qualified mental-health professionals certified in

teaching students with an EBD. The special education teacher who taught the SCLE was a trained cognitive behavioral therapist, and the special education teacher who taught in the MLRE was a Licensed Master Social Worker. The special education teachers also had instructional aides who were highly qualified and trained in handling students with an EBD. Thus, both programs were staffed by highly qualified personnel equipped to handle the erratic and negative behaviors of this population. This high level of expertise may be the most appropriate interpretation of the differences between these findings and the findings of previous studies. In contrast to findings from previous research, all mean scores improved within a 2-year time span.

The findings of this study are a contribution to both the broken-glass and Social, Academic, and Cognitive theories. According to the theories, they provide a learning environment with optimal academic, emotional, and behavioral support for the student with an EBD; where the teacher can develop and implement techniques to foster cognitive-behavioral skills (Chisolm, 2008). These skills are needed to manage the learning environment and various emotional and behavioral issues more effectively so as to focus on the academic task at hand. By fostering these skills, highly expert professionals may have been responsible for ensuring that students improved both in academic achievement and in self-concept. Teachers were able to assist and work with the EBD students to develop cognitive-behavioral skills that focused on social, emotional, and behavioral strategies. These strategies may have assisted the students in being able to cope with stressful or negative situations by employing short-term strategies to stop and focus on their reactions to a situation. By stopping and focusing, the student can gain a better understanding of how thoughts, emotions, and behaviors are connected and affect one another. Students with an EBD may have been more able to manage their own actions in different learning environments, leading to more favorable academic outcomes.

The results of this study showed that after 2 years in positive learning environments, the students in the MLRE had scores that were significantly higher for academic achievement, compared to the students in the SCLE. Researchers and educators remain ambivalent regarding the inclusion of this population in general education classrooms, and opposition is firm in some cases (Hallahan et al., 2011; Rutherford et al., 2007). Some empirical research has shown that inclusive classrooms exacerbate the issues with different learning styles and various emotional and behavioral problems of these children (Prather-Jones, 2011; Rutherford et al., 2007). Writers who have been hesitant to support inclusive classrooms have argued that academic goals for this population should parallel the goals set for nondisabled peers (Hallahan et al., 2011) and that students with EBDs can learn appropriate social interaction and academic learning from peers in the inclusive classrooms (Prather-Jones, 2011). The findings in this study support the benefits of both inclusive and self-contained classrooms under the conditions of a highly expert staff and learning environment. However, maybe training for future special education teachers of students with EBD, would benefits from some type of mental health training.

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