

ABSTRACT

EVANS, RUTH DAVIS YACHÁN. Effects of Reciprocal Peer Tutoring on Academic Achievement and Social Interaction of Elementary Students with Emotional-Behavioral Disorders. (Under the direction of Dr. Douglas Cullinan.)

The purpose of the present study was to determine the effectiveness of an author-developed treatment, *Teaching Ourselves Positive Skills* (TOPS), to increase academic scores and positive tutoring behavior of elementary students with EBD. The multi-component intervention combined best-practice strategies for reciprocal peer tutoring, direct instruction, token economy, self- and peer-management, and planning for generalization. The ten-week study was implemented in a 4th-5th-grade classroom in a public separate school for elementary students with EBD. Six students participated in the program, although data were collected for two students only, those who met established criteria of documented academic and social behavior deficits and IQ scores above 70. They were 10- and 11-year old African American boys who were completing schoolwork at the 1st - 2nd-grade level and were having substantial difficulty with peer relationships. A multiple probe across academic behaviors design was used to determine the effectiveness of TOPS in increasing scores in math and spelling. Accuracy with which the target dyad performed the intervention and interscorer reliability of academic probes were recorded. Student and teacher acceptability surveys were completed after training and at the conclusion of the intervention.

A concurrent study examined whether positive tutoring behavior taught and reinforced during morning sessions of TOPS generalized to a second less structured setting during afternoon sessions.

Academic scores increased from baseline to treatment phases for both students, although limited data points and divergent baseline trends suggest cautious interpretation of results. Single replications across addition facts and two sets of spelling words indicate a tentative relationship between TOPS and scores for both students. The dyad adhered to tutoring protocol with 85% accuracy overall. Interscorer reliability of academic probes was 100%.

Positive tutoring behavior in the generalized setting increased substantially after students received explicit instruction in the second setting. Students and teachers found TOPS fun, easy, and beneficial for improving academics and peer interactions. Limitations and implications for future research and practice are discussed.

**EFFECTS OF RECIPROCAL PEER TUTORING ON
ACADEMIC ACHIEVEMENT AND SOCIAL INTERACTION OF
ELEMENTARY STUDENTS WITH EMOTIONAL-BEHAVIORAL DISORDERS**

by

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BIOGRAPHY

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CHAPTER 1 – INTRODUCTION

Academic Failure and Relationship Problems

In order for students to be identified with Emotional Disturbance (ED), they must exhibit at least one of the five characteristics stated in the federal definition of the Individuals with Disabilities Education Act (IDEA; U.S. Department of Education, 1998; see Table 1). Numerous studies have suggested that students with emotional and behavioral disorders (EBD) have co-occurring deficits in two or more problem areas described in IDEA (Bussing, Zima, Belin, & Forness, 1998; Cullinan & Epstein, 2001; Forness, Kavale, & Lopez, 1993). Whereas merits of the present definition continue to be debated (Council for Children with Behavioral Disorders, 1987; Forness & Knitzer, 1992; Nelson, Rutherford, Center, & Walker, 1991), it is generally accepted that two salient and debilitating characteristics of students with EBD are academic failure and relationship problems (Cullinan, 2002; Kauffman, 2001; O'Shaughnessy, Lane, Gresham, & Beebe-Frankenberger, 2002; Walker, Colvin, & Ramsey, 1995).

Empirical research has documented quantitative differences between elementary-age students with EBD, the target group in this study, and their nondisabled peers in both of these domains. Youngsters with EBD have demonstrated considerably more deficits in basic academics (Bower, 1968; Cullinan, Schloss, & Epstein, 1987; Ellen, 1989) and essential classroom survival skills including work habits, following academic directions, and attention to task (Cullinan, Evans, Epstein, & Ryser, 2003; Gresham, Elliot, & Black, 1987; Merrell, Johnson,

Merz, & Ring, 1992). They also experienced substantially more relationship problems, including lack of cooperation with peers (Gresham et al., 1987), inability to get along with others (Cullinan et al., 2003), and rejection from nondisabled peers (Sabornie, 1987). In addition to acting-out behaviors commonly associated with these students, or perhaps because of them, youngsters with EBD frequently fail at academic tasks and social relationships (Forness et al., 1993; Gresham, Lane, & Lambros, 2000; Lane, 1999; Hinshaw, 1992a).

Targeting Both Deficit Areas

Problems with Current Practice

Lack of Effective Remediation Programs

Researchers (Hinshaw, 1992a; Lane, 1999; Peacock Hill Working Group, 1991; Steinberg & Knitzer, 1992; Sutherland & Wehby, 2001) have suggested implementing school-based interventions that positively affect both academic failure and relationship problems of students with EBD. Unfortunately, there is a shortage of empirically sound and effective remediation programs that target both deficits demonstrated by these students (Gunter & Denny, 1998; Ruhl & Berlinghoff, 1992).

Poor Academic Climate

The documented discrepancy between recommended best teaching practices and the reality of how teachers and students with EBD interact with each other in the classroom is also problematic and troubling (Gunter, Denning, Jack, Shores, & Nelson, 1993; Sutherland & Wehby, 2001; Wehby, Lane, & Falk, 2003; Wehby, Symons, Canale, & Go, 1998). Even though strategies such as increased opportunity to respond (Sutherland, Alder, & Gunter, 2003) and behavior-specific

teacher praise (Sutherland, Wehby, & Copeland, 2000) are associated with improved academics and behavior, teachers may prefer to use a “curriculum of control” (Steinberg & Knitzer, 1992, p. 148) to manage student disruption or noncompliance.

Lack of Generalization

Across academic and social skills. The reciprocal relationship between academic and social deficits is fairly well established (Coie & Krehbiel, 1984; Hinshaw, 1992b; Lane, Wehby, Menzies, Gregg, Doukas, & Munton, 2002; Sutherland et al., 2003). Research suggests, however, that interventions that improve one deficit do not assure simultaneous amelioration of the other (Coie & Krehbiel, 1984; Lane, 1999; Miller, Gunter, Venn, Hummel, & Wiley, 2003; Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003).

Across setting. Another problem is lack of generalization across setting. Even when best practice strategies are used to teach academic and prosocial skills, the effects may not be transferred from one academic environment to another (Ayllon & Roberts, 1974; Quay, Glavin, Annesley, & Werry, 1972; Quinn, Kavale, Mathur, Rutherford, & Forness, 1999; Scott & Nelson, 1998; Scruggs & Mastropieri, 2001).

Classwide Peer Tutoring

One well-established research-based intervention that reinforces both basic academic achievement and positive social interaction is reciprocal peer tutoring (RPT). The premier example of this strategy, ClassWide Peer Tutoring (CWPT; Greenwood, Delquadri, & Carta, 1997), was developed and has been used

successfully for over 20 years at the Juniper Gardens Children's Project in Kansas City, Kansas. It was originally designed to offer at-risk and disadvantaged elementary-age students in general education classrooms more opportunities to learn and practice basic academic skills using a systematic and engaging set of instructional components that combine reciprocal peer tutoring and group reinforcement in a game-like format (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986; Greenwood, 2001).

Since its inception, CWPT and other variations of reciprocal peer-mediated instruction (e.g., Classwide Student Tutoring Teams, Harper, Mallette, Maheady, & Brennan, 1993; Peer-Assisted Learning Strategies, Fuchs, Mathes, & Fuchs, 1996) have been shown to be effective in general and special education classrooms for improving academic achievement of students with diverse backgrounds and needs, including those with attention deficit hyperactivity disorder (ADHD; DuPaul, Ervin, Hook, & McGoey, 1998), learning disabilities (LD; Fuchs, Fuchs, & Burish, 2000; Harper et al., 1993; Mathes & Fuchs, 1993), moderate mental disabilities (Schloss, Kobza, & Alper, 1997), and limited English proficiency (Greenwood, Arreaga-Mayer, Utley, Gavin, & Terry, 2001). Also, studies have shown that students with high incidence disabilities have improved school survival skills (Locke & Fuchs, 1995; Spencer, Scruggs, & Mastropieri, 2003) and social interactions (Kohler & Greenwood, 1990; Maheady & Sainato, 1985) while using variations of RPT. Additionally, students and teachers who participated in peer-tutoring programs have expressed satisfaction with the technique (Bell, Young, Blair, & Nelson, 1990) and preference for it over methods of conventional instruction (Spencer et al., 2003).

Rationale for the Study

Although RPT has repeatedly demonstrated its effectiveness with students at-risk for school failure and those with high incidence disabilities, there have been only a few research studies (Falk & Wehby, 2001; Locke & Fuchs, 1995; Wehby et al., 2003) employing this treatment with elementary-age students with EBD. One reason for this paucity may be that in order for this type of program to be effective, students must demonstrate specific behavioral skills required of tutors and tutees, such as giving and taking directions and giving and receiving appropriate positive and corrective feedback. Because of performance or skill deficits, these behaviors may be the very ones missing from the social repertoires of young students with EBD. For this reason or others, teachers may decide against using this intervention, even though successful implementation of it may ameliorate both prevalent and difficult-to-treat characteristics, academic failure and relationship problems.

Purpose of the Study

The purpose of this exploratory investigation was to determine the effectiveness of an author-developed RPT intervention, Teaching Ourselves Positive Skills (TOPS; see Appendices C and D), to increase academic achievement and positive peer tutoring behaviors. This multi-component treatment combined salient elements of reciprocal tutoring with academic and behavioral strategies designed for elementary students with EBD taught in small classroom settings (i.e., separate classroom, separate school). Features that distinguish TOPS from earlier versions of RPT include explicit instruction in tutor and tutee behaviors; procedural prompts, and a peer-assessment instrument. This study employed a multiple probe across

behaviors design to evaluate three sets of academic scores. A concurrent study examined whether positive tutoring skills taught and reinforced during TOPS generalized to a center setting.

Research Questions

This study examined (a) academic performance and (b) procedural fidelity of a student dyad during the academic intervention, referred to as *TOPS Time*, and (c) generalization of positive tutoring behavior during a second session, referred to as *Center Time*, with the following questions:

1. Will the use of TOPS result in an increase from baseline to intervention in math and spelling probe scores for target students?
2. Will target students practice the TOPS procedure across academic behaviors with at least 80% accuracy?
3. Will positive tutoring behavior taught and practiced during TOPS Time generalize to a different setting and academic activity during Center Time, and result in an increase in positive tutoring behavior and a decrease in negative tutoring behavior?

Summary

In summary, this study explored the effectiveness of an author-developed multi-component intervention based on RPT strategies used for students at-risk for school failure and those with high incidence disabilities (Greenwood et al., 1997). Classwide peer tutoring was modified to address academic and peer relationship deficits specific to elementary-age students with EBD taught in a separate setting. A multiple probe across behaviors design was used to determine if there was a

functional relationship between the intervention and the dependent variables, academic probe scores. Additionally, procedural fidelity of the intervention by target students was examined. In a concurrent investigation, positive and negative tutoring behaviors exhibited by the target dyad in another setting, Center Time, were recorded and evaluated for generalization of skills taught and practiced during TOPS Time.

Overview

Chapter 2, Review of the Literature, is divided into three sections: (a) academic and relationship problems of elementary students with EBD; (b) peer tutoring and students with EBD; and (c) implications for further research and the development of TOPS. Studies exploring academic problems and relationship problems are discussed separately, as are two types of peer tutoring, nonreciprocal and reciprocal. In the third section, the development of TOPS based on best-practice interventions is described.

Chapter 3, Method, provides information concerning participants, settings, and research design. An overview of TOPS is included in Materials and Procedures.

Results are presented in Chapter 4. Probe scores and procedural fidelity percentages are reported for target students during the academic intervention, TOPS Time. Also percentages of positive and negative tutoring behaviors in the second setting, Center Time, are reported.

Chapter 5, Discussion, summarizes the rationale and results of this study in view of documented characteristics of elementary students with EBD and empirical

research in RPT. Limitations and implications are examined and suggestions for future research are made.

Seven appendices contain documents and forms used in this study. Appendix A contains material sent to prospective teachers, including an introductory letter, an overview of TOPS, and a questionnaire. Appendix B contains consent and assent forms and letters. Appendix C contains materials used during TOPS Time, including rules, cue card, coach and player cards, teacher and peer-assessments, and group contingency posters. Appendix D contains materials used during Center Time, including cue cards and assessment checklists. Appendix E contains procedural fidelity and behavior recording forms. Appendix F contains examples of flash cards and academic probes. Appendix G contains teacher and student post-training and post-intervention social acceptability surveys.

CHAPTER 2 – REVIEW OF THE LITERATURE

Academic and Relationship Problems of Elementary Students with EBD

When discussing the problems of young students with EBD, dangerous and disturbing characteristics such as aggression, disruptiveness, and defiance are generally considered most severe and pervasive (Forness et al., 1993; Gresham et al., 2000; Grosenick, George, George, & Lewis, 1991; Hinshaw, 1992a). However, empirical studies (e.g., Cullinan et al., 2003) have found that elementary students with EBD experience deficits in each of the five characteristics of the IDEA definition of ED (see Table 1). Two characteristics of the federal definition, (a) inability to learn not explained by intellectual, sensory, or other factors, and (b) inability to build or maintain satisfactory interpersonal relationships, are of particular interest to this study, as both were targeted by the intervention.

In order to investigate the assumption that young students with EBD have substantially more difficulty with academics and interpersonal relationships than their nondisabled age-mates, 12 group research studies that compared elementary students with EBD and their nondisabled peers were examined. These studies compared elementary students' academic and social behavior in school settings by category (EBD and without EBD) and in some cases, by category and gender. See Tables 2 and 3 at the end of this section for an overview of these studies.

Reviewed articles were published in professional journals within the last 20 years (1983-2003), with one notable addition, the Bower study (1969). This review begins with the 1958 project conducted by a pioneer in the field of behavioral

disorders, Eli Bower, and one of the early efforts to describe students with behavioral difficulties and school-related problems. Next, seven studies dealing with two types of deficits, basic academics (i.e., reading, math) and school-survival skills (i.e., off-task, poor work habits), will be considered. Finally, eight studies comparing relationship problems (i.e., social skill deficits, difficulty getting along with peers) of elementary students with and without EBD will be reviewed.

-
- (i) The term means a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child's educational performance:
- (A) An inability to learn that cannot be explained by intellectual, sensory, or other factors.
 - (B) An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.
 - (C) Inappropriate types of behavior or feelings under normal circumstances.
 - (D) A general pervasive mood of unhappiness or depression.
 - (E) A tendency to develop physical symptoms or fears associated with personal or school problems.
- (ii) The term includes schizophrenia. The term does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance.
-

Table 1 Individuals with Disabilities Education Act Definition of Emotional Disturbance (ED) as an Educational Disability (U.S. Department of Education, 1998, p. II-46.)

Bower Study

At the request of the California legislature, elementary-age students with emotional and behavioral problems (n = 207) and their classmates (n = 5,793) in grades 4 – 6 throughout the state were compared on variables including academic achievement and aptitude, social adjustment, and relationships with peers as perceived by the students themselves, their teachers, and their classmates. The 207 students designated as *emotionally disturbed* had previously been identified by mental health professionals in clinic settings. At least one of these students (162 boys and 45 girls) was a member of each of the 200 classrooms chosen for study. Teachers were told the classes were selected at random and no particular instructions were given for the identified student. Teachers may or may not have been aware of clinic identification or treatment.

Bower and his team found that students identified as emotionally disturbed had average aptitude, with IQ scores ranging from 92.9 to 103.2. However, their academic performance significantly lagged behind that of their nonidentified peers in both reading and math achievement tests. Math scores of identified students were generally even lower than their reading scores. Identified students had few satisfactory social relationships and rated themselves lower in self-image than nonidentified students.

The presence of academic deficits and relationship problems reported by Bower were later conceptualized as characteristics (a) inability to learn that cannot be explained by intellectual, sensory, or other factors, and (b) inability to build or

maintain satisfactory interpersonal relationships with peers and teachers, of the federal definition of ED (see Table 1).

Academic Problems

Students with EBD who exhibit an inability to learn which cannot be explained by intellectual, sensory, or health factors (see Table 1) are unsuccessful in the educational setting even though they do not have substantial deficits in cognition, hearing, or vision or other medical impediments. They experience significant problems with academic subjects such as math, reading, or written expression and do not readily exhibit school survival skills such as staying on task, following teacher directions, or accepting feedback appropriately. The following group research studies focus on two aspects of Inability to Learn, basic academic deficits and school-related skills deficits (see Table 2).

Basic Academic Deficits

In comparing elementary students with EBD to those without EBD, several studies confirmed that students identified with EBD had more academic problems than did their nondisabled peers. Cullinan and colleagues (1987), for example, asked teachers to assess the academic performance of 6-11 year old students with the Behavior Problem Checklist (BPC; Quay & Peterson, 1975). Boys with EBD (n = 67) were perceived as achieving significantly lower than their nondisabled male peers (n = 246) in reading comprehension and math skills. No significant difference was found in reading or arithmetic teacher-ratings for girls with EBD (n = 11) and girls without EBD (n = 182).

Ellen (1989) also used a rating scale (Classroom Adjustment Rating Scale, CARS; Weissberg, Gesten, & Ginsburg, 1981) for teachers to determine academic deficits in reading comprehension and math of 3rd grade boys with EBD (n = 48) and without EBD (n = 169). Boys with EBD were found to have significantly higher rates of learning problems in both areas than boys without EBD.

In contrast, in Lopez, Forness, MacMillan, Bocian, and Gresham (1996), groups of 2nd – 4th graders with EBD (n = 48) and without EBD (n = 102) in general education classes had comparable mean standard scores in reading (with EBD: $M = 67.25$; without EBD: $M = 66.47$) and mathematics (with EBD: $M = 78.78$; without EBD: $M = 83.43$) as measured by the Wide Range Achievement Test-Revised (WRAT-R; Jastak & Wilkinson, 1984). However, students in both categories fell well below the mean of 100. Contrary to findings by Bower (1969), reading scores were even lower than math scores.

School-Related Skills Deficits

Cullinan and colleagues (2003) used the Scale for Assessing Emotional Disturbance (SAED; Epstein & Cullinan, 1998), a teacher-rated instrument based on the federal definition of ED, to compare elementary students with EBD (n = 336) and without EBD (n = 548) on the subscale, Inability to Learn, which includes items related to deficits in basic academics (reading, math, written expression) and maladaptive school-related behaviors (disinterest in school task, does not independently complete schoolwork). Subscale scores for students with EBD were significantly higher, indicating more problems, than subscale scores of students without EBD.

In an earlier study, Cullinan, Epstein, and Kauffman (1984) used individual item results of the BPC (Quay & Peterson, 1975) to compare prevalence percentages of school-related problems by category and gender for 6-to-10- year-old students with EBD (n = 186) and without EBD (n = 298). Regarding selected items that seem relevant to this domain, teachers perceived elementary students with EBD and those without EBD as significantly different in the following: distractibility (boys: with EBD, 80%, without EBD, 33%; girls: with EBD, 89%, without EBD, 38%); inattention (boys: with EBD, 89%, without EBD, 33%; girls: with EBD, 67%, without EBD, 16%); and dislike of school (boys: EBD, 33%, without EBD, 13%; girls: EBD, 22%, without EBD, 4%). No significant differences between boys and girls with EBD on these three items were noted.

Ellen (1989) also used teacher ratings of school-related deficits in a subscale of the CARS (Weissberg et al., 1981) called Learning Problems, to compare boys with and without EBD on items including *poorly motivated*, *poor work habits*, and *poor concentration*. Boys with EBD were rated significantly higher than boys without EBD on this measure.

In another boys only study, Gresham and colleagues (1987) used the Academic Performance subscale of the Teacher Rating of Social Skills (TROSS, 1987) to determine teacher perception of classroom skills such as *follows teacher's directions*, *produces correct work*, and *asks questions*. As with the results of the Ellen study (1989), boys with EBD (n = 23) were seen to exhibit significantly fewer of these classroom skills than boys without EBD.

Merrell and colleagues (1992) found a significant difference in mean scores between elementary students with EBD (n = 114) and those without EBD (n = 108) in school-related skills using the Scale of Social Competence and School Adjustment (SSCSA; Walker & McConnell, 1988). Students without EBD were shown to be substantially more competent in items including *good work and study habits, follows academic instructions, and attends to assigned tasks*.

Relationship Problems

The EBD characteristic, inability to build or maintain satisfactory relationships with peers and teachers (see Table 1), concerns relationship problems that may include lack of cooperation with peers, difficulty with reciprocal interactions, and inability to offer or accept positive reinforcement from others. The following research studies compared the ability of young students with and without EBD to interact well with each other (see Table 2).

Cullinan and colleagues (2003) used the SAED (Epstein & Cullinan, 1998) to determine that students with EBD and students without EBD had significant differences on subscale scores of Relationship Problems (e.g., *inability to get along with others, feelings of rejection and isolation*). Boys and girls with EBD had higher (more maladaptive) scores than boys and girls without EBD. No significant difference was found between boys and girls with EBD, however.

In another study using teacher rating scales, Cullinan and Epstein (1985) matched 8 –10-year-old students with EBD (n = 30) to students of the same age and gender without EBD (n = 30) and found that teachers using the BPC (Quay & Peterson, 1975) rated students with EBD as having significantly more difficulty with

interpersonal competence than those without EBD. When further examined by gender, boys with EBD and girls with EBD were perceived by their teachers as having more problems than boys without EBD or girls without EBD, respectively. However, there was no significant difference between boys with EBD and girls with EBD.

Merrell et al. (1992) asked teachers to use the SSCSA (Walker & McConnell, 1988) to rate 114 students with EBD and 108 without EBD in their ability to perform teacher-preferred social skills (e.g., *empathetic, uses self-restraint, socially mature*) and student-preferred social skills (e.g., *invites peers to play, interacts well with peers*). Higher scores indicated more social competence, and scores of one standard deviation or more below the mean suggested difficulty with social skills. Students with EBD were rated significantly lower than students without EBD on both subscales. For teacher-preferred skills, 80% of the students with EBD averaged one standard deviation below the mean, and for student-preferred skills, 70% of the students with EBD obtained scores one standard deviation below the mean.

A study examining boys' relationship problems was carried out by Gresham and colleagues (1987). They found that teachers rated 23 mainstreamed boys with EBD in grades 1-8 as less socially competent than 77 of their nondisabled peers, using the TROSS (Gresham & Elliot, 1985). Three subscales of the TROSS included items pertaining to peer relationships: Social Initiation (e.g., *interacts with peers, invites others to play*), Cooperation (e.g., *shares with others, cooperates with peers*), and Peer Reinforcement (e.g., *praises peers, volunteers to help peers*). Boys with

EBD were rated significantly lower than nondisabled boys on each of these subscales.

Lopez et al. (1996) used the Social Skills Rating System-Teacher (SSRS-T, 1990), the revised and renamed TROSS (Gresham et al., 1987, p. 88), for teachers to assess peer acceptance and teacher-related social skills of 2nd-4th grade students with EBD (n = 48) and without EBD (n = 102). Students with EBD were rated significantly lower than students without EBD on both measures of social skills.

Two studies (Farmer & Hollowell, 1994; Sabornie, 1987) employed sociometric measures to determine how elementary-age students felt about each other. Sabornie used the How I Feel Toward Others (HIFTO; Agard, Veldman, Kaufman, & Semel, 1978) to investigate social acceptance and rejection among 22 matched pairs of physical education students with and without EBD in grades 2, 3, 4, and 6. He found that students with EBD and their nondisabled peers rated each other similarly on items of familiarity and rejection. However, there was a statistically significant difference in each of the comparisons of acceptance (*acceptance as a friend*) and mild intolerance (*don't especially care about*) between the two categories of students. Students with EBD were substantially more accepting of their nondisabled peers than the reverse (with EBD accepted without EBD, 57%; without EBD accepted with EBD, 34%). Also, students with EBD were less tolerated by their nondisabled peers (without EBD not tolerant of with EBD, 39%; with EBD not tolerant of without EBD, 23%).

In the second sociometric study, Farmer and Hollowell (1994) used a researcher-made instrument to compare peer-assessed behavioral characteristics

for mainstreamed boys with EBD ($n = 18$) and their nondisabled peers ($n = 107$). Several items pertained to social relationships: Cooperative (*friendly, share, easy to get along with*), Popular (*classmates like to play with them*), and Leader (*in charge during games, students look up to them and do what they say*). There were no significant differences on these three items between boys with EBD and their peers without EBD.

Summary

The results of the literature review for academic problems generally reflected the findings of the Bower study (1969) for deficits in basic academics and school-related skills; the reviewed studies indicated substantial discrepancies between students with and without EBD in both domains. Several studies revealed that boys with EBD were perceived by their teachers to have more academic problems than boys without EBD, although the same did not apply to girls with EBD when compared to girls without EBD.

As with academic problems, the results of the literature review for relationship problems reflected the findings of the Bower project (1969). All but one of the studies found that boys and girls with EBD and boys and girls without EBD differed significantly in social competence and relationships with teachers and peers. Unlike the Bower study, however, teachers found no significant difference in social deficits between genders. The contrasting perceptions of social problems may be explained by two different types of ratings used. Whereas teachers perceived boys and girls with EBD to have about the same degree of problems; in the Bower study, boys and

girls with emotional disturbance used a self-report measure to indicate differing levels of social problems.

Table 2 Academic and Relationship Problems of Elementary Students With and Without EBD

Citation	Instrument ^a (T, P, S ^b)	Grouping Variable ^c	Academic Problems (CA, SS ^d)	Relationship Problems
Bower (1969)	Achievement "Class Play" "Thinking About Yourself" Teacher-Rating Scale (T, P, S)	Category: Gender x Category:	CA, SS: EBD > W/O EBD SS: EBD M > W/O EBD M EBD: M > F	EBD > W/O EBD EBD M > W/O EBD M EBD F > W/O EBD F EBD: M < F
Cullinan & Epstein (1985)	BPC (T)	Category: Gender x Category:		EBD > W/O EBD EBD M > W/O EBD M EBD F > W/O EBD F EBD: M = F
Cullinan et al. (1984)	BPC (T)	Category: Gender x Category:	SS: EBD > W/O EBD EBD M > W/O EBD M EBD F > W/O EBD F EBD: M = F	EBD > W/O EBD EBD M > W/O EBD M EBD F > W/O EBD F EBD: M = F
Cullinan et al. (2003)	SAED (T)	Category: Gender x Category:	CA, SS: EBD > W/O EBD EBD: M = F	EBD > W/O EBD EBD M > W/O EBD M EBD F > W/O EBD F EBD: M = F

Table 2 (Continued)

Citation	Instrument ^a (T, P, S ^b)	Grouping Variable ^c	Academic Problems (CA, SS ^d)	Relationship Problems
Cullinan et al. (1987)	Depression index (BPC) (T)	Category: Gender x Category:	CA: EBD > W/O EBD EBD F = W/O EBD F EBD M > W/O EBD M	
Ellen (1989)	CARS (T)	Category: Gender:	CA, SS: EBD > W/O EBD Male Only	
Farmer & Hollowell (1994)	Researcher-made (P)	Category: Gender:	 Male Only	EBD = W/O EBD Male Only
Gresham et al. (1987)	TROSS (T)	Category: Gender:	SS: EBD > W/O EBD Male Only	EBD > W/O EBD Male Only
Lopez et al. (1996)	WRAT-R SSRS-T (T)	Category: Gender:	CA: EBD = W/O EBD Not compared	EBD > W/O EBD EBD: M = F

Table 2 (Continued)

Citation	Instrument ^a (T, P, S ^b)	Grouping Variable ^c	Academic Problems (CA, SS ^d)	Relationship Problems
Mattison, Morales, & Bauer (1992)	SSCSA (T)	Category: Gender:	 	EBD > W/O EBD Not compared
Merrell, Johnson, Merz, & Ring (1992)	SSCSA (T)	Category: Gender:	SS: EBD > W/O EBD M > F	
Sabornie (1987)	HIFTO (P)	Category: Gender:		EBD > W/O EBD Not compared

Note.

a. See Table 3 for instrument references.

b. Raters: T = Teacher; P = Peer; S = Self-report.

c. Category = With EBD or Without EBD (W/O EBD).

d. CA = content area (reading, math, written); SS = school-related or study skills

e. ">" = more problems or deficits (e.g., EBD > W/O EBD in reading = students with EBD have greater reading deficits).

Table 3 Assessment Instruments

Achievement	<u>M</u>	<u>SD</u>
Wide Range Achievement Test (WRAT); Jastak & Wilkinson, 1984.	100	15
Behavioral and Social	<u>M</u>	<u>SD</u>
Behavior Problem Checklist (BPC); Quay & Peterson, 1975.		
Classroom Adjustment Rating Scale (CARS); Weissberg, Gesten, & Ginsburg, 1981.		
How I Feel Toward Others (HIFTO); Agard, Veldman, Kaufman, & Semmel, 1978.		
Scale for Assessing Emotional Disturbance (SAED); Epstein & Cullinan, 1998.	100	15
Scale of Social Competence and School Adjustment (SSCSA); Walker & McConnell, 1988.	10	3
Social Skills Rating System-Teacher (SSRS-T); Gresham & Elliot, 1990.	100	15
Teacher Rating of Social Skills (TROSS); Gresham & Elliot, 1987.	100	15

Peer Tutoring and Students with EBD

The studies reviewed in the previous section provide empirical evidence that elementary-age students with EBD exhibit deficits in basic academics and social relationships. For at least 30 years, peer tutoring has been considered as a strategy to help overcome both of these problems. In this section, two types of tutoring research will be reviewed, nonreciprocal and reciprocal peer tutoring.

Although the focus of this research is the effect of *reciprocal* tutoring, this review will begin with a synthesis of nonreciprocal research because three-fourths of the studies (24 of 33) published in peer-reviewed journals in the last 30 years involved students with EBD and cross-age or cross-ability tutoring. First, an article (Scruggs, Mastropieri, & Richter, 1985) assimilating 17 studies of nonreciprocal peer tutoring and students with EBD, representing the extant literature on this subject published between 1972 and 1984, will be outlined. Next, seven studies dealing with nonreciprocal tutoring and students with EBD published from 1985 to the present will be synthesized (see Table 4). Finally, nine studies published between 1983 and 2004 concerning the focus of the present research, reciprocal peer tutoring and students with EBD, will be reviewed (see Table 5).

Selection Criteria and Search Procedure

Participants, Setting, and Research Design

An initial search of peer-reviewed journal articles within the last 30 years found only three studies (Falk & Wehby, 2001; Locke & Fuchs, 1995; Wehby et al., 2003) investigating reciprocal peer tutoring for elementary students with EBD. Because of this paucity, it was decided to broaden the scope and review studies

concerning either nonreciprocal or reciprocal peer tutoring and students who were school-identified with EBD or considered at risk for EBD in grades K-12. All experimental studies had to be conducted in a school setting. Only reports of single-subject or group experimental or quasi-experimental original research were included.

Independent Variables

Nonreciprocal peer tutoring. Nonreciprocal peer tutoring was defined as one cross-age or same-age student helping another with an academic task (Cohen, 1986). Within this model, student dyads may vary in levels of cognition, ability, and social skills, although at least one tutor in each study must be identified with EBD according to federal and state regulations. The tutee may have EBD, another disability, or no acknowledged exceptionality. The main qualifier for *nonreciprocal* tutoring was that only one member of the pair acted as the instructor during a tutoring session.

Reciprocal peer tutoring. Reciprocal peer tutoring was defined as two students taking turns acting as the tutor and the tutee for instruction or review of academic material (Delquadri et al., 1986). Student dyads must exchange roles during the tutoring session, both giving and receiving academic assistance. At least one member of the dyad must be identified with EBD according to federal and state regulations

Dependent Variables

Dependent variables included basic academic skills (i.e., math, reading, spelling), school survival skills (i.e., on-task, compliance), and peer relationship skills (i.e., cooperative interactions, supportive behavior).

Database Search Procedure

Two electronic databases, Educational Resources Information Center (ERIC) and PsychINFO, were searched for peer-reviewed research journal articles published from 1972 to the present. The search was conducted by combining keyword variations of (a) *emotional-behavioral disorders* (emotional disturbance, behavior disorders, emotionally handicapped); (b) *peer tutoring* (dyad teaching, dyad tutoring, peer interventions, peer mediation, peer teaching, peer tutoring); and (c) *academic instruction* (academics, mathematics, reading). A hand search was conducted on current issues of *Behavioral Disorders*, *Journal of Emotional and Behavioral Disorders*, *Journal of Special Education*, and *Remedial and Special Education*.

Additionally, an ancestral search was conducted for the following: (a) research studies identified by the database and hand search; and (b) review articles of: educational interventions for students with EBD (Coleman & Vaughn, 2000; Dunlap & Childs, 1996; Gunter & Denny, 1998; Kroesbergen & Van Luit, 2003; Mooney, Epstein, Reid, & Nelson, 2003; Ruhl & Berlinghoff, 1992); reciprocal peer tutoring for students with other high incidence disabilities (Mathes & Fuchs, 1994; Maheady et al., 2001); tutoring applications in specialized subject areas (Heron, Welsch, & Goddard, 2003); and other peer-mediated instruction and interventions (Utley, Mortweet, & Greenwood, 1997).

Nonreciprocal Peer Tutoring and Students with EBD

Early Research

Scruggs and colleagues (1985) investigated group and single-subject research studies in their effort to determine the effectiveness of peer tutoring for students with EBD. They defined tutoring as “delivery of academic instruction by another student, either older or the same age as the tutee” (p. 284). Tutor participants ranged in grade level from high school (e.g., Maher, 1984), through middle grades (e.g., Franca, 1983), to elementary classrooms (e.g., Weiner, Goldman, Lev, Toledano, & Rosner, 1974). Tutees included students at risk for academic failure (Csapo, 1976), and students with EBD (Franca, 1983) and other disabilities, including autism (Norris, 1978), learning disabilities (Balmer, 1972), and mental retardation (Maher, 1982).

Tutoring took place in educational environments throughout the continuum of service delivery, including residential (Kreutzer, 1973; Gable & Kerr, 1980; Stowitschek, Hecimovic, Stowitschek, & Shores, 1982), separate classroom (Wingert, 1981), and resource (Jenkins, Mayall, Peschka, & Jenkins, 1974) settings.

Scruggs and colleagues (1985) reported results of tutoring by the two domains of interest in the present study, academics and social behaviors. They found that in all 17 studies, tutees’ scores in basic academics, including reading (Csapo, 1976), math (Franca, 1983), spelling (Stowitschek et al., 1982), and writing (Maher, 1982), improved from baseline levels during the tutoring intervention.

Academic gains for tutors were more equivocal. For example, Csapo (1976) reported significant pre-post gains in number of words read correctly and Franca

(1983) reported a decrease in math errors; while Gable and Kerr (1980) and Kreutzer (1973) observed no substantial improvement in math or reading, respectively.

Social variables were reported in 10 studies and ranged from directly observed behaviors during tutoring (i.e., on task, disruptive events) to those less easily attributed to the intervention (e.g., self-concept, attitude toward academics, dressing neatly, discipline referrals). Examples of observed social benefits for tutors and tutees included: friendlier play (Balmer, 1972), increase in positive remarks (Csapo, 1976), and increase in on-task behavior (McHale, Olley, Marcus, & Simeonsson, 1981).

Scruggs and colleagues (1985) drew several conclusions from their review: (a) tutees invariably gained academically from being tutored; (b) tutors may gain academically if the material is appropriate for their ability and school level; (c) it is likely that both participants gain socially from the intervention; and (d) tutoring does not seem to affect global measures of social perception by students or teachers.

Current Studies

Next, group and single-subject research studies concerning the effectiveness of nonreciprocal tutoring and students with EBD from 1985 to the present will be summarized. The seven group and single-subject design studies parallel those reviewed by Scruggs and colleagues (1985) in selection of participants, settings, and variables. Results of current research also corroborated findings of the early investigation. In these studies, students selected as tutors were all school-identified with EBD, and in the majority of cases, male. Four studies were boys only;

participants with EBD were not described by gender in the remaining three studies (see Table 4).

Same-age tutors were employed in three studies (Franca, Kerr, & Reiz, 1990; Hogan & Prater, 1993; Shisler, Osguthorpe, & Eiserman, 1987), while tutors worked with students younger than themselves in the others (Blake, Wang, Cartledge, & Gardner, 2000; Cochran, Feng, & Cartledge, 1993; Scruggs, Mastropieri, Veit, & Osguthorpe, 1986; Scruggs & Osguthorpe, 1986).

In one study (Shisler et al., 1987), tutees were nondisabled elementary students. Tutees in the remaining studies were identified with disabilities including EBD (Blake et al., 2000; Cochran et al., 1993; Franca et al., 1990), LD (Hogan & Prater, 1993; Scruggs & Osguthorpe, 1986), and severe multiple disabilities (Scruggs et al., 1986).

Tutoring sessions were held in a variety of grades and educational environments, including secondary general education (Hogan & Prater, 1993) and separate school (Franca et al., 1990); middle grades separate school (Blake et al., 2000); and elementary level resource (Scruggs & Osguthorpe, 1986), separate class (Scruggs et al., 1986; Shisler et al., 1987), and separate school (Cochran et al., 1993).

Effects of tutoring on academic variables were similar to those reported in the earlier review (Scruggs et al., 1985). In four studies, tutees demonstrated gains in basic academics, including reading (Cochran et al., 1993; Scruggs & Osguthorpe, 1986), spelling (Hogan & Prater, 1993), and math (Franca et al., 1990). Two of these indicated comparable academic improvement for tutors as well (reading,

Cochran et al., 1993; math, Franca et al., 1990). Only one study (Scruggs et al., 1986) found no significant change in academic variables for tutees, although this may have been because these three participants were identified as *severely mentally handicapped* with IQ levels determined to be *not testable* (p.38). Two studies found no significant change in academic scores of tutors (Scruggs et al., 1986; Scruggs & Osguthorpe, 1986). The remaining two studies (Blake et al., 2000; Shisler et al., 1987) examined social variables only.

Overall, both tutees and tutors experienced increased prosocial behavior during intervention, including verbal support (Blake et al., 2000), cooperative statements (Cochran et al., 1993), on-task behavior (Hogan & Prater, 1993), and social interactions in gym following tutoring sessions (Franca et al., 1990). One study (Scruggs & Osguthorpe, 1986) reported improved attitude for tutees but not for tutors, and another (Shisler et al., 1987) reported improved attitude of nondisabled students toward their tutors with EBD. Franca et al. (1990) found no substantial change in attitude or self-concept by either tutors or tutees. Likewise, Scruggs et al. (1986) found no significant change on objective measures, although anecdotal remarks by tutors favored the intervention.

Summary

To summarize, research studies exploring nonreciprocal tutoring and students with EBD within the last 30 years described similar results. Students with EBD across school levels and educational environments successfully tutored cross-age or same-age students. Academic gains for tutees were consistent throughout. Tutors also demonstrated academic improvement, although not as reliably. An

increase in prosocial behaviors was observed for tutors and tutees, although changes in social perception were less easily detected.

Reciprocal Peer Tutoring and Students with EBD

The focus of the present study is reciprocal peer tutoring and its effect on academics and social interactions of elementary students with EBD taught in a separate setting. As previously stated, although there is a large body of literature supporting RPT for students at risk for school failure and those with other high incidence disabilities (e.g., Greenwood, 2001; Maheady, Harper, & Mallette, 2001; Mathes & Fuchs, 1994), only nine studies employing RPT as the independent variable to remediate academic or social deficits of students with EBD were located in the database and hand search (see Table 5). Although the extant literature on this topic was limited, these articles described key aspects of RPT related to the present study.

Scruggs and Osguthorpe (1986) used a control group pre- post-intervention design to determine if a peer tutoring program, Harrison's Structured Tutoring (Harrison, 1976), affected criterion-based or standardized reading scores and attitudes toward school for students with EBD ($n = 7$) and LD ($n = 24$). Participants in the experimental group (EBD = 4; LD = 12) were instructed in tutoring behavior including (a) sitting with the tutee, (b) giving positive feedback, and (c) correcting errors. The tutoring pairs switched roles after 15 minutes. Although each pair engaged in tutoring for 30 minutes each session, the number of sessions among pairs varied, ranging from 2 days to 5 days a week. Results indicated significant difference in criterion-based reading scores between experimental and control

groups. However, no difference between groups was noted for standardized reading or attitude toward school measures.

Classwide Peer Tutoring

Five studies employed Classwide Peer Tutoring (CWPT; Delquadri et al., 1986). The three reviewed next involved adolescents with and without disabilities in social studies classrooms. The final two (Kamps, Kravits, Rauch, Kamps, & Chung, 2000; Kamps, Kravits, Stolze, & Swaggart, 1999) will be discussed in a separate section because CWPT was used as one part of a multi-element program instead of as the sole independent variable.

Maheady, Harper, and Sacca (1988) investigated the effects of CWPT in high school resource classes of students with high incidence disabilities (i.e., EBD, LD, MD). They used a withdrawal design across two social studies classes (n = 20; 14 male) and compared baseline and CWPT weekly quiz scores. Students in Class 1 were in the 9th grade; Class 2 combined grades 10 -12. Students were not described by specific disability, nor were individual scores reported. The CWPT intervention alternated with the traditional classroom routine of independent study using handouts outlining chapter material. During the two treatment phases, reciprocal peer tutors worked together for 30 minutes a day in 15-minute tutor/tutee segments. The tutor used the same study guide presented in baseline and offered immediate feedback after each tutee response. Points were awarded and publicly posted for correct responses, correcting errors, and appropriate tutoring behaviors.

Results of scores from both classrooms suggested a functional relationship between improved marks and CWPT. For example, in Class 1, the average baseline

quiz grade was 59%. During the first intervention, the average score increased 20 percentage points. When the baseline condition was reintroduced, the mean score dropped 22 points. Finally, when CWPT was reinstated, the mean increase was 17 points over the second baseline average. During the last two weeks of the study, 70% of all students earned A's on quizzes and no one received a failing grade.

At the end of the 15-week intervention, students completed a 17-item consumer satisfaction social validity survey. They were generally pleased with the intervention and felt like peers thought they were smarter and were nicer to them after implementation. They, in turn, felt friendlier to others and 75% of them stated that they would *definitely* recommend CWPT to teachers.

Bell and colleagues (1990) replicated the Maheady et al. study (1988) and extended it by examining the use of CWPT as an intervention for inclusion of students with EBD in high school general education Ancient World Civilization class. They employed a multiple baseline across two classrooms to determine the effect of CWPT on history test scores of students with EBD and their nondisabled peers. Participants included 5 males and 1 female with EBD, and 52 classmates without disabilities. Reciprocal tutoring-pairs quizzed each other three times a week using history-fact flash cards for 10-minute segments. Both classes were tested on the material at the end of each week. Individuals with EBD made substantial gains when baseline average scores were compared to CWPT average scores. For example, one student raised his average baseline score of 32% to 74% during CWPT. Another student raised his baseline average 53 percentage points during

intervention. The pretest mean for students with EBD was 38.5, whereas the posttest mean for these 6 students was 72.

Another encouraging outcome of this intervention was that the test score gap between students with EBD and their nondisabled classmates was dramatically narrowed during intervention. For example, In Class 1, the difference between average scores was 26.8 percentage points. During CWPT, students with EBD averaged only 3.6 percentage points lower than their nondisabled peers. Changes in social interactions and other school survival skill behaviors were not measured during this study, although students expressed satisfaction with the intervention in a 4-item social validity survey.

A third study (Spencer et al., 2003) also examined the effects of CWPT in improving social studies scores of students with EBD. Spencer and colleagues employed a within subject crossover group design to compare traditional instruction methods and CWPT. Participants (70% male) attended a separate school for students with emotional and behavioral problems. They were members of three 7th grade classrooms (n = 12) and three 8th grade classrooms (n = 18) that were randomly assigned to begin with either traditional instruction or CWPT. After two weeks, teaching methods were alternated. Dependent variables included chapter pre- and post-tests, weekly quizzes, pre- and post-intervention summary statements, and percent of time-on-task for individuals (traditional) and tutoring-pairs (CWPT). Students completed a satisfaction survey at the end of the study.

Effect sizes favored CWPT over traditional methods (pre-post tests, .88; quizzes, .68; open-end, .40; on-task, .89). The majority (83%) of students expressed

their preference for CWPT over the traditional method, although concerns included not wanting to read the material repeatedly and dissatisfaction with tutoring partners.

Peabody Peer Tutoring

The next two studies employed a variation of CWPT developed at Vanderbilt University. A third study (Wehby et al., 2003) using the same intervention and another reading strategy will be reviewed in the multi-element section.

Locke and Fuchs (1995) used the Partner Reading component of Peabody – Peer Mediated Instruction (P-PMI; Fuchs, Mathes, & Fuchs, 1993) in a separate class of 5th and 6th grade boys with EBD. The purpose of this study was to improve on-task behavior and positive social interactions among classmates. Data were collected on these measures for three of the 13 boys in the class. Although a reciprocal reading strategy was used in the single subject withdrawal design, data concerning academic gains were not reported.

After a seven-day initial baseline phase of traditional reading class activities, students spent four days learning the P-PMI strategy, including one day for discussion of prosocial behaviors necessary for successful tutoring interactions (i.e., how to tactfully help a partner, how to be supportive, how make corrections positively). During intervention, tutoring-pairs received points and small prizes for following correct procedures and working together cooperatively. The first intervention phase lasted five days, and was followed by a four-day withdrawal period. Intervention 2 lasted four days.

Results for on-task behavior (i.e., *appropriate eye contact, in seat, hands to self*) and positive social interaction (i.e., *pleasant smile, verbal statement displaying*

support, agreement, or cooperation) suggested association between improvements and P-PMI. For example, the on-task behavior average for the three target students was 56% during baseline, 87% during intervention 1, 49% during withdrawal, and 88% during intervention 2. Average number of positive interactions also increased during P-PMI: baseline, 3.33; intervention 1, 18.67; withdrawal, 5.0; intervention 2, 16.33.

Social validity of the program was determined by 10 adults who watched 2-minute segments of student interactions during baseline and intervention phases. These reviewers, who were blind to the purpose of the study, observed a significant difference between on-task behavior and quality of interaction (positive or negative) exhibited during the two phases.

Another study (Falk & Wehby, 2001) explored the effectiveness of a revised version of P-PMI, Peer-Assisted Learning Strategies (PALS; Fuchs et al., 1996), for kindergarten students with behavioral problems and phonological and decoding skills deficits. This intervention, K-PALS, was used with six male students taught in a separate classroom for students with EBD. All of the boys exhibited acting out behaviors, although their special education identifications varied (1 = ED, 1 = OHI/ADHD, 4 = S/LI). A multiple baseline across tutor-pairs design was used in an 11-week intervention to determine the effectiveness of K-PALS in increasing scores on letter-sound identification, word blending (e.g., *cow* + *boy* = *cowboy*) and segmentation (number of sounds in a word). Baseline condition consisted of 20-minute sessions three times a week of teacher-led instruction in sound play (i.e., sound identity, rhyming, blending, and segmenting) and decoding lessons.

Reciprocal tutoring was introduced to student-pairs sequentially. Each pair was taught to alternate roles of tutor and tutee and practice the daily teacher-led decoding activities. Pairs were given weekly point sheets and could earn points for completing the decoding activities, following procedures correctly, and working cooperatively.

Comparison of pretest/posttest probes indicated a marked improvement in letter-sound identification and blending scores for all six boys. For example, on letter-sound probes, Sam's score increased from 0 correct before K-PALS (teacher-directed and peer-tutoring) to 14 correct after the intervention. On blending, his score jumped from 0 to 18. Improvement in segmenting was not as consistent or dramatic for most of the boys. Only one student, Tommy, demonstrated a substantial difference (pretest, 0; posttest, 15). Sam's scores were typical of the remaining five boys (pretest, 8; posttest, 7). Measures of school survival skills (i.e., on-task behaviors) and social interaction were not included in this study.

Multi-Element Studies

Wehby and colleagues (2003) used PALS (Fuchs, Fuchs, Mathes, & Simmons, 1997) and a modified phonics-based explicit instruction reading program, Open Court Reading (Adams et al., 2000) to extend previous studies (Falk & Wehby, 2001; Locke & Fuchs, 1995) examining reading and behavior deficits of elementary students with EBD. They employed both interventions simultaneously in a multiple baseline design across two K – 1st-grade classrooms in a self-contained school. Eight boys, six African American and two European American ages 7 – 10-years- old identified with severe behavior problems, participated in the study.

During the intervention phase, students received intensive small-group instruction four days each week in phonemic awareness, explicit phonics, fluency, and comprehension skills. Open Court Reading was taught 45 minutes each day. Supplemental PALS tutoring sessions were held an additional 30 minutes each day.

Results of 1-minute reading probes of nonsense words, blending, sound naming, and sight words were modest across both classrooms. Improvement from baseline to intervention was shown for all four 1st graders in blending. Three students showed improvement in nonsense words, two improved in sight word recognition, and only one student improved in sound naming. There was essentially no change from baseline to intervention for the four kindergarteners in nonsense words, blending, or sight word recognition. Two kindergartners showed some improvement in sound naming.

Percentage of time students attended and rate of inappropriate behavior (e.g., annoying comments, complaining, tattling, making fun, threatening, arguing, refusal to comply) were tracked for both groups. Four boys showed improved levels of attending by the end of the intervention. Meaningful changes in inappropriate behavior were not observed for either group.

Moderate improvements in reading skills were seen by the end of the dual-element intervention phase, although the authors reported these gains did not seem to carry over to general reading ability. They hypothesized that larger gains in reading were needed for concomitant positive changes in behavior to take place. The authors also commented on the variability of day-to-day behavior during baseline and intervention. They hypothesized that “episodic problem behaviors”

(p.235) characteristic of young students with EBD may have accounted for lack of academic or behavioral improvement.

Kamps and colleagues (Kamps et al., 2000; Kamps et al., 1999) employed a delayed control group experimental design in a two-cohort four-year prevention program for elementary students with and at risk for EBD. The purpose of these studies was to investigate the effectiveness of a multi-element universal prevention program for increasing prosocial and decreasing maladaptive behaviors of young students with or at risk for EBD. Students in both cohorts were selected on the basis of results of the Systematic Screening for Behavior Disorders (SSBD; Walker & Severson, 1992). In Cohort 1 (19 boys, 1 girl), eight students were identified with EBD and the others were designated as at-risk for EBD. The make-up of Cohort 2 was comparable, with 16 boys and 2 girls participating. Three students were identified with EBD and the remaining 15 were designated at risk for the disorder. Students in both cohorts were taught in general and special education classrooms.

Proactive strategies for supplemental instruction of basic academics (reading comprehension and spelling) included CWPT and other tutoring formats such as cross-age and adult-led tutoring. Additional components of the comprehensive program were: (a) weekly social skills training sessions targeting acceptable classroom behaviors and appropriate peer interactions; (b) classroom management interventions (e.g., token economy, response cost, contracts, self-management, school-home notes); and (c) classroom teacher training and consultation.

Direct observation and researcher-made teacher-rated behavior scales were used to measure students' school survival and social skills (compliance with teacher

requests, academic engagement, work completion, in-seat, peer interactions).

Results were positive for students who were members of highly structured classrooms where the behavioral package was strongly implemented. Such students in both cohorts increased academic engagement and compliance and decreased negative peer interactions, out of seat, and aggression. Students' academic scores were not recorded in these reports.

Because component analysis was not undertaken in these studies, no specific functional relationship between CWPT and improvement in social relationships was established. Kamps and colleagues (2000) concluded that the package intervention, including direct instruction of classroom and interpersonal skills, peer tutoring, self-management training, and highly structured classrooms, were important elements for the success of the universal prevention program.

Summary

Six empirical studies used RPT as the single intervention for students with EBD. Although only one study (Locke & Fuchs, 1995) investigated changes in social interactions among classmates, the remaining five detailed gains in reading and social studies for students with EBD in various grade levels and educational environments.

Three studies employed RPT in combination with at least one other best-practice strategy in multi-component interventions. No definitive conclusion can be made about the efficacy of RPT to remediate academics or behavior because component analyses were not performed. Generally, results were mixed across the three studies. Disappointingly, no substantial or generalizable gains were made in

reading or behavior for elementary students who received PALS and Open Court (Wehby et al., 2003). The other studies (Kamps et al., 2000; Kamps et al., 1999) concluded that the package intervention was most effective for members of highly organized and structured classrooms.

Table 4 Nonreciprocal Peer Tutoring and Students with EBD

Citation	Design	Participants	Setting	Dependent Variables		Independent Variable	Results
				Academic Behavior	Social Behavior		
Blake et al. (2000)	Multiple-baseline across subjects	African American 3 Tutors M; EBD 11-13 yr 3 Tutees M; EBD 9-10 yr	Separate School EBD 6 th -7 th gr 3 rd -4 th gr		Verbal/nonverbal Supportive behavior (VNS) Verbal/nonverbal Abusive behavior (VNA)	Peer directed social skills instruction	All increased VNS & decreased VNA. Tutors made slightly more gains.
Cochran et al. (1993)	Treatment v. Control	African American M; EBD 4 Tutors 4 Control 11yr 4 Tutees 4 Control 7 yr	Separate School EBD 5 th gr 2 nd gr	Reading Sight-words	Social skills: Teacher perception Student perception Cooperative interactions	8 wks. 32 sessions Instruction & practice Review game Testing Reinforcement: Encouraging Statements & Stickers Public Posting	All increased # sight words & academic cooperative statements. Decreased put-downs. Social Skills: Pairs rated higher than control.
Franca et al. (1990)	Multiple-baseline across tutor pairs	8 M EBD 13-16 yr	Separate School EBD	Math Fractions	Sociometric Self-concept Attitude-math Dyadic social interaction (gym)	26 days 15 min/day T-made instructions	Tutors improve math, peer rating. Tutees improve math, behavior. Improved PE interactions. Little change in attitudes.

Table 4 (Continued)

Citation	Design	Participants	Setting	Dependent Variables		Independent Variable	Results
				Academic Behavior	Social Behavior		
Hogan & Prater (1993)	Multiple-baseline across settings & reversal	Tutor M, EBD 15 yr Tutee M, LD 14 yrs	Resource General High 10 th gr 9 th gr	Spelling Vocabulary	Disruptive Off Task	7 days Tutoring 7 days Self-monitor	Tutor less disruptive; better self-monitoring. Tutee improve on-task, self-monitor, spelling & vocabulary.
Scruggs et al. (1986)	Pre-post Test Control Group	Tutors & Controls 24 EBD 3 Tutees Multiple disabilities	Separate class Elementary 3 rd -5 th gr	Standardized test scores	Absences Disciplinary referrals Behavior scales Attitude to school	DISTAR Language scripted lessons Model cooperative play	No change in objective measures. Anecdotal reports favor tutoring.
Scruggs & Osguthorpe (1986)	[Ex. 1] Pre-post Test Control Group	35 LD 12 EBD 13 tutors 14 tutees 20 control	General Resource Elementary 1 st -5 th gr	Criterion & Standard (WJ) Reading	Attitude Toward School	Sit with tutee; give positive feedback; correct errors	Reading Criterion: Gain for tutees, not tutors or control; no sig gains on WJ. Attitude: Tutees sig gain, not tutors, control.
Shisler et al. (1987)	Pre-post test Control group	Tutors 14 EBD Tutees 28 Gen Ed Control 46 Gen Ed	Separate class EBD Elementary 5 th -6 th gr		Student attitude questionnaire	Students with EBD tutor students without EBD in vocabulary & sign language	Without EBD attitude toward with EBD tutors rated higher than non-tutoring peers with EBD.

Table 5 Reciprocal Peer Tutoring and Students with EBD

Citation	Design	Participants	Setting	Dependent Variables		Independent Variable	Results
				Academic Behavior	Social Behavior		
Bell et al. (1990)	Multiple baseline across settings	6 EBD 5 M 15 yr 1 LD 52 without disabilities	General History HS	History tests		CWPT ¹ 11 wks 20 min 3 x wk Flash cards	Significant gains in test scores. Closed gap between students with & without EBD. Students & teachers satisfied with CWPT.
Falk & Wehby (2001)	Multiple baseline across tutor pairs	6 M 4 S/LI 2 EBD 5-6 yr	Separate Class K	Letter-sound Segment Blending		K-PALS ² 11 wks 20 min 3 x wk T-directed Sound play & decoding	Increase in letter-sound ID & blending for most. Little change in segmenting.
Kamps et al. (1999)	Experiment vs. Control-wait	<i>Cohort 1</i> 16 African American 4 Euro American	General & separate classes Elementary		Aggression; following teacher directions; academic engagement; peer interactions; completion of schoolwork; in-seat	CWPT ¹ , other tutoring; Social skills; Classroom management: Token economy, Response cost, Self-management, Home notes, Teacher in-service, Consulting	Positive gains for students in highly structured classes that used multiple elements: Improved prosocial skills; decrease in negative verbal, noncompliance.
Kamps et al. (2000)	Year 1: Cohort 1 = Control	19 M, 8 EBD 5-11 yr <i>Cohort 2</i> 11 African American 5 Euro Am 2 Hispanic 16 M, 3 EBD 5-9 yr					

Table 5 (Continued)

Citation	Design	Participants	Setting	Dependent Variables		Independent Variable	Results
				Academic Behavior	Social Behavior		
Locke & Fuchs (1995)	ABAB	3 M EBD 11yrs	Separate Class EBD 5 th gr		On-task Positive social Interaction	Peabody-PMI ³ 10 min x 9 days Partner-Read Teach cooperation Points & prizes	Improved on-task & positive social interaction.
Maheady et al. (1988)	ABAB	N = 20 EBD, LD, MD	Resource High 9 gr 10-12 gr	Social Studies		CWPT ¹ 15 wks 30 min 4 x wk	Improved scores; students & teachers satisfied with CWPT.
Scruggs & Osguthorpe (1986)	[Ex. 2] Pre-post test Control Group	24 LD 7 BD 8 pairs 15 control	General Resource Elementary 1st-5 th gr	Criterion & Standard (WJ) Reading	Attitude Toward School	10 wks 30 min variable days Sit with tutee; give positive feedback; correct errors	Tutor pairs gained sig on criterion; no difference on WJ. No sig gain in attitude for either tutors or control.
Spencer et al. (2003)	Within Subject Cross- Over Tutoring v. Traditional	N = 30 M = 70% EBD	Separate School EBD 7 th - 8 th	Social Studies Pre-post tests Quizzes Open-end questions	On-task	CWPT ¹ 4 wks 35 min each day no points or teams	Soc Studies ES's: Tutor >Traditional Pre-post: .88; Quiz: .68; Open-end: .40 On-task: .89 Students: 83% enjoyed; didn't like reading 2 times; Teachers: liked structure & routine.

Table 5 (Continued)

Citation	Design	Participants	Setting	Dependent Variables		Independent Variable	Results
				Academic Behavior	Social Behavior		
Wehby et al. (2003)	Multiple baseline across 2 classes	6 African American 2 Euro American All male 5 EBD, 1 LD, 1 MD, 1 SLI 7-10 yrs	Separate school EBD K – 1 st gr	Reading Nonsense Blending Sounds Sight words Segmenting	Attending Inappropriate Behavior (provoke, annoy, complain, tattle, make fun, refusal to comply)	Open Court ⁴ 45 min 4 x week phonemic awareness, phonics, comprehension PALS ⁵ 30 min 4 x week fluency & comprehension	Reading: Mixed for both groups. Nonsense, blend, sight-little or no change. Segment-modest improvement. Behavior: Attending – variable in baseline & intervention. Inappropriate – little or modest change for all.

Note.

1= ClassWide Peer Tutoring (Greenwood et al. 1997).

2 = Kindergarten Peer-Assisted Learning Strategies (Falk & Wehby, 2001).

3 = Peabody - Peer Mediated Instruction (Fuchs et al., 1993).

4 = Open Court Reading (Adams, Bereiter, Carruthers, Case, Hirshberg, McKeogh, et al., 2002).

5 = Peer Assisted Learning Strategies (Fuchs et al., 1997).

Summary of Literature Review

Academic and Social Behaviors

Examination of empirical studies comparing elementary students with EBD and without EBD on two characteristics provided a uniform description, with only a few apparent discrepancies. For academic problems, only one study (Lopez et al., 1996) found that students with EBD scored in the average range in reading, math, and written language. The rest (e.g., Cullinan et al., 1984; Ellen, 1989; Gresham et al., 1987) reported young students with EBD experienced more deficits in basic academics as well as school-related survival skills, including attention, on-task behaviors, and study habits, than young students without EBD. Likewise, most of the studies examining relationship problems reported elementary students with EBD rated themselves and were rated by teachers and peers as having significant difficulty establishing friendships, getting along with others, and practicing appropriate social skills. Only one exception (Farmer & Hollowell, 1994), a sociometric rating for boys only, indicated no significant difference in cooperation or popularity between boys with EBD and boys without EBD.

Overall, the results of the literature review concurred with Bower's (1969) findings and the federal definition of ED for the first two characteristics; that is, generally, elementary students identified as EBD had more school-related academic and relationship problems than students not identified as EBD.

Peer Tutoring

Studies examining nonreciprocal and reciprocal peer tutoring and students with EBD within the last 30 years depicted both interventions as beneficial.

Investigations using nonreciprocal peer tutoring described students with EBD across school levels and educational environments successfully tutoring cross-age or same-age students. Academic gains for tutees were consistent throughout. Tutors also demonstrated academic improvement, although not as reliably. An increase in prosocial behaviors was observed for tutors and tutees, although changes in social perception were less easily detected. Likewise, reciprocal peer tutoring was also shown to be effective in increasing academic scores, school survival skills, and social interactions for students with EBD across various classroom settings, subject areas, and grade levels.

Two studies (Locke & Fuchs, 1995; Spencer et al., 2003) documented more on-task behavior during RPT than in baseline conditions. Traditional baseline activities consisted of teacher directed round-robin oral reading or individually completed worksheets. Evidently and understandably, students were more engaged during the structured, scripted, fast-paced, and interactive programs of P-PMI and CWPT.

Only one study (Locke & Fuchs, 1995) besides the multi-element programs (Kamps et al., 2000; Kamps et al., 1999; Wehby, 2003), examined peer social interaction. Also, only the Locke and Fuchs study described a social skills training segment with scripted lessons that taught students how to offer positive corrective feedback and how it might feel to be corrected by a peer. Even though the multi-element studies examined academics and social behavior, a functional relationship was not established between the dependent variables and RPT.

Implications for Further Research and the Development of TOPS

Reciprocal peer tutoring has been recommended as a promising intervention for students with EBD (Landrum, Tankersley, & Kauffman, 2003; Sutherland & Wehby, 2001; Walker, 1995), and in a limited number of studies, has demonstrated partial remediation of academic and school survival skill deficits. However, the paucity of research left unanswered questions about the utility of this treatment for the target group in this study. Further investigation was undertaken to corroborate results and extend the intervention.

Characteristics of EBD and RPT

Elementary students with EBD taught in separate settings may require more support and reinforcement than is typically suggested or necessary in traditional RPT programs because of maladaptive behaviors characteristic of their disability (see Table 1). In addition to academic and relationship problems, elementary-age students with EBD have been described by teachers as aggressive, disruptive, and defiant (Bower, 1969; Ellen, 1989), and by peers as getting angry easily, hitting others, starting fights, and not following rules (Farmer & Hollowell, 1994). Also, when compared to students without EBD, youngsters with EBD were perceived to have more feelings of worthlessness, depression, and anxiety (Cullinan et al., 2003; Ellen, 1989). These behaviors coupled with the ones previously discussed, including poor work habits, lack of cooperation with peers, and inability to get along with others, may inhibit the success of a reciprocal peer tutoring intervention unless specific modifications and accommodations are incorporated into the program.

Consideration of CWPT

During the initial phase of the present study, components and procedures of ClassWide Peer Tutoring (Greenwood et al., 1997) were examined and considered for use with elementary students whose maladaptive emotional and behavioral characteristics were severe enough to necessitate a separate educational placement. The teacher manual, *Together We Can! ClassWide Peer Tutoring to Improve Basic Academic Skills* (Greenwood et al., 1997), as well as journal articles describing the program (e.g., Arreaga-Mayer, 1998; Delquadri et al., 1983; Delquadri et al., 1986; Fulk & King, 2001; Greenwood, 2001), were inspected with the academic and behavioral deficits of these students in mind.

The original CWPT intervention, the *Peer Tutoring Spelling Game* (PTSG; Delquadri et al., 1983), was developed to increase scores on weekly spelling tests of 3rd grade low-income inner city students. The PTSG intervention was based on three principles of instruction: (a) increased opportunity to respond and active participation by students; (b) selection of teacher-targeted academic skills; and (c) use of empirically based behavioral strategies (Delquadri et al., 1986). Techniques of Direct Instruction, including scripted questions and responses and immediate positive and corrective feedback (Stein, Carnine, & Dixon, 1998), were also incorporated. Behavioral strategies in the original study and in the current CWPT program (Greenwood et al., 1997) used a multi-component package including (a) teacher praise, (b) token reinforcement for correct academic responding and good tutoring behaviors, (c) group and individual contingencies, and (d) public posting of academic scores and team points.

Successful Behavioral Strategies for Students with EBD

The strategies employed in CWPT have also been used successfully for students with EBD to improve academics and increase prosocial behavior. Examples of these best practice interventions include: (a) teacher praise and increased opportunity to respond (e.g., Sutherland, 2000; Sutherland, Wehby, & Yoder, 2002); (b) token reinforcement of academic performance and social competence (e.g., Ayllon & Roberts, 1974; Hewett, 1974; Lane, 1999; McGinnis, Friman, & Carlyon, 1999; Musser, Bray, Kehle, & Jenson, 2001; Quay et al., 1972; Zlomke & Zlomke, 2003); (c) peer-mediated and group contingencies (e.g., Anhalt, McNeil, & Bahl, 1998; Barrish, Saunders, & Wolf, 1969; DuPaul, McGoey, & Yugar, 1997; Fixsen, Phillips, & Wolf, 1973; Fowler, 1986; Smith, Young, Nelson, & West, 1992); and (d) public posting of academic and behavioral progress (e.g., Barrish et al., 1969; Musser et al., 2001). Also, direct instruction has been used to improve academic performance, teach pro-social behaviors, and decrease disruptive behaviors of students with EBD (Alvarado, 2003; Nelson, Johnson, & Marchand-Martella, 1996; Trout, Epstein, Mickelson, Nelson, & Lewis, 2003).

Rationale for Development of TOPS

Procedural elements. Although the principles of instruction used in CWPT have been shown to be effective for students in general education and are empirically based for students with EBD as well, changes in procedural elements may be needed. Components of the intervention may not be practical for small groups or they may be too difficult or aversive for elementary students with EBD (see Table 6 for a comparison of CWPT and TOPS). For example, CWPT uses a two-team contingency, random partner matching, and weekly changes of teams and

pairs. In TOPS, a whole group contingency model is used to promote teamwork and cooperation among classmates. Also, dyads are matched according to academic level and social compatibility and remain as partners for a longer period of time.

Tutor-tutee interaction. The tutor-tutee interaction prescribed in CWPT may be problematic for students who have difficulty getting along with each other and giving or accepting directions and corrective feedback appropriately. In CWPT spelling, for example, the tutor says a word and directs the tutee to write it on the tutoring worksheet. If the tutee misspells it, the tutor corrects him and then tells him to write the corrected word three times while the tutor looks on. If the tutee complies, he receives points from the tutor. In TOPS, the tutor leads the academic drill *and* he participates with the tutee in saying, writing, and reading each word (or math problem). The tutor assigns points to the tutee for correct academic response and to himself for following correct procedure.

Additional support and reinforcement. Because of externalizing behaviors (e.g., rule-breaking, defiance, noncompliance, arguing and fighting with peers) or internalizing behaviors (e.g., feelings of worthlessness, depression, or anxiety), students with EBD may need more explicit instruction, prompting, and support in order to realize the benefits of a reciprocal tutoring program. Additionally, in order to encourage compliance and procedural fidelity, more frequent token and tangible reinforcers may be necessary.

Generalization of social behaviors. There is a plethora of programs for teaching prosocial behaviors to students with EBD (see Darch & Kame'enui, 2004; Gresham, 2002; Kerr & Nelson, 2002; Sugai & Lewis, 1996; Walker et al., 1995).

However, research has indicated that social skills training for students with EBD have produced modest effects over time and setting (Forness, Kavale, Blum, & Lloyd, 1997; Mathur & Rutherford, 1996; Quinn et al., 1999; Scruggs & Mastropieri, 2001). In order for generalization to occur, it must be planned for and programmed in the initial intervention (Kiburz, Miller, & Morrow, 1984; Lane & Beebe-Frankenberger, 2004; Nelson, Smith, Young, & Dodd, 1991; Odom, Chandler, Ostrosky, McConnell, & Reaney, 1992; Sasso, Melloy, Kavale, 1990; Stokes, 1992; Stokes & Baer, 1977).

In TOPS, there are two settings and two opportunities to practice academic and social behaviors. The first, TOPS Time, is comparable to CWPT, with scripted tutor-tutee exchanges. The second less structured setting, Center Time, was designed to incorporate salient academic and social interaction features of TOPS in a less structured environment. Mediators include (a) common social and physical stimuli (i.e., peers, flash cards), (b) naturally reinforcing contingencies (i.e., positive peer interactions), and (c) peer-assessment instruments. Also, a program of systematic sequential modification was planned for Center Time to promote generalization of prosocial tutoring behaviors across time, setting, participant, and response.

Summary

Teaching Ourselves Positive Skills was developed to treat academic and behavioral deficits of elementary students with EBD. This initial project was not a comparison of the effectiveness of CWPT and TOPS or a component analysis of either strategy. Modifications and additions to CWPT were made based on

characteristics of elementary students with EBD and interventions that were empirically sound and suggested in the literature as helpful for remediating academic and social deficits of these students (Alberto & Troutman, 2003; Colvin, Sugai, & Patching, 1993; Darch & Kame'enui, 2004; Kerr & Nelson, 2002; Reitz, 1994; Rhode, Jenson, & Reavis, 1992; Schloss & Smith, 1998; Zirpoli & Melloy, 2001).

Additionally, because of the importance of generalization of prosocial behaviors and minimal positive results documented in previous studies (e.g., Forness et al., 1997; Mathur & Rutherford, 1996; Nelson et al., 1991; Quinn et al., 1999), a program for generalization was incorporated in TOPS.

Next, Table 6 displays key components of both programs. A rationale is included for each modification or added component. The next chapter describes the materials and procedures designed for TOPS and used in this study.

Table 6 Component Comparison of CWPT and TOPS

Component	CWPT	TOPS	Rationale for TOPS
Academics	Math, Spelling, Reading, Social Studies	Initial Study: Math & Spelling	Easily adapted for various levels.
Students & Class	Whole class; grades 1-8 General or special education; Inclusion; At-risk, LD, LEP	Initial Study: Separate school, small class.	Target students with EBD & academic deficits.
Partner Match	Random paring; dyads change after one-week sessions.	Students paired according to level and goals; dyads remain together.	Students matched for academic & social needs; rapport built over several weeks.
Teams	Students are assigned to 2 teams; teams change weekly.	Whole class works together as a team.	Small class size; encourage teamwork; discourage competition.
Student Training	1-to-3 sessions, 15 min each. Teach rules & procedures, practice each skill.	3-4 sessions, 30 min each. Teach behavioral rules, tutoring skills, peer-assessment, & group meeting procedures.	More time needed to learn & practice rules, procedures, & peer-assessment.
Flash Card Content & Difficulty Level	Divide content into 10-30-item lists requiring overt response. Curriculum grade-level objectives. Lowest students should be able to cover list 2 x 10 min. Difficulty = 20-40% correct on pretest.	10 flash cards, each tutor presents 5; all pairs receive same subject, differentiated content; academic and behavioral IEP-based goals. Difficulty = $\leq 50\%$ on baseline probes.	Skill remediation of content according to needs. All cards completed in 20-min session; more time than CWPT-tutor & tutee write each response.
Schedule & Roles	New academic skill every week. 30-35 min 3-4 x week. Dyads change roles once after 10 minutes. 20 minutes tutoring, 10 minutes reporting scores, clean up, transitions.	30-35 min 3-4 x week. Tutor-pairs change roles after complete $\frac{1}{2}$ flash cards 20 minutes tutoring, 5 minutes partner asses, 5 minutes group meeting.	Changing roles contingent on expectation of task completion, not length of time.
Academic Assessment & Scoring	Day 5 15-minute Posttest on week's work; 15- minute Pretest on next week's work. Expect 70% of class to score $\geq 90\%$ on posttest.	Daily probes on 10 flash card facts track progress. Procedural checks throughout intervention to assure fidelity. Criterion = 80%.	Short probes accommodate test-taking anxiety & attention problems. Continue until criterion met; not contingent on weekly schedule.
Procedural Fidelity	If not, asses quality of peer tutoring or decrease number of problems or difficulty level.	Tutor circles each step on tutor card after completed.	Fidelity tune-ups.

Table 6 (Continued)

Component	CWPT	TOPS	Rationale for TOPS
Rules	<i>5 Good Sport Rules</i> Praise the winners for their accomplishment. Praise the effort of the losing team. Don't tease the losers. Don't cry or complain about losing. Know they will have a new chance to win on another day.	Behavioral rules Talk softly, Take turns, Stay on task, Try your best. Positive Partner Skills Coach-give clear directions; give good feedback. Player-follow directions quickly; accept feedback politely. Try to work it out before asking for teacher help.	<i>Good Sport Rules</i> need modification for EBD. There are no losers in TOPS. Students work together, not compete against each other. Clearly state rules & expectations in positive terms.
Earning Teacher-Assigned Behavioral Points	<i>Bonus Points Reminders</i> 1 to 5 points marked on pair score sheet. Tutor: Reading clearly, watching tutee write words, correcting mistakes, giving correct # points; keeping the tutee busy Tutee: Writing quickly, saying and writing word at the same time, writing answers 3 times after a mistake, putting pencil down when timer rings.	<i>How to Earn Stars card</i> 1 point per behavior marked on daily teacher cards; same list rules & expectations taught in training & reinforced in peer-assessment.	Each acknowledged behavior is worth 1 point (not variable, 1-to-5). Repetition of rules & procedures. Tutor/Tutee tasks different from CWPT; more emphasis on working together than tutor being in charge of tutee. Tutor leads & participates in saying & writing.
Group Contingency	Individual & partner points earned for academics; bonus behavior points. Team competition for social reinforcement (applause). Winning team is declared at the end of each week.	Points earned for following rules & procedures & academic success; social, activity, & token reinforcers. Interdependent whole-group & individual contingencies.	Encourage teams. Students need more frequent tangible reinforcers to encourage academic effort & appropriate behavior.
Tutor Score Sheet	2-page weekly Tutoring Point Sheet for dyad, numbered 1-804. Tutor marks through #s as tutee gives correct (2 pts) or corrected (1 pt) response.	Tutor circles each correct response on Answer Sheet & calculates a daily total.	Simplified scoring; Tutor card includes scoring tutee oral & written response; practice answers.
Practice card		Tutor writes every response with tutee.	
Tutee Answer Sheet	Tutoring Worksheet 30 small spaces for responses and, if necessary, writing 3 corrections for each.	One answer sheet has 2 columns, 5 lines, 1st tutee & 5 lines, 2 nd tutee. Tutees are required to say, write, and read each answer with the tutor.	Larger area to write answers. Tutee required to write each response 1 time - less punitive.

Table 6 (Continued)

Component	CWPT	TOPS	Rationale for TOPS
Tutor Feedback	Immediate feedback for correct (<i>Correct. 2 Points</i>) or incorrect (<i>No. Try again for 1 point</i>). Directs tutee to repeat correction 3 times.	Immediate feedback for correct or incorrect and verbal repetition of correct answer (<i>Yes! 2+3=5; No. 2+3=5</i>). No direction to try again; no points for 2nd answer. No repetition 3 times.	Immediate feedback. Tutor leads tutee in practicing correct response only. Discourages guessing, arguing, & refusals.
Asking for Help	Help card for teacher assistance.	Help card. List of steps to follow before asking for teacher help.	Encourages working out a problem before asking teacher; lists procedure for working it out.
Procedural Prompts	Not included in CWPT.	A procedural checklist for tutors details sequential steps.	DI scripted format Visual cues; Promotes treatment fidelity.
Practice Round	Not included in CWPT.	At the beginning of session, tutor leads tutee through flash cards. Before tutees are required to say, write, and read problems, review by reciting the answer-side of card.	Additional practice before testing situation.
Partner Self-Assessment	Not included in CWPT.	After each tutoring session, dyads assess their performance by completing a checklist of rules & Positive Partner Skills.	Plan for generalization Transition from teacher-mediation to peer-mediation.
Group Meetings	Not included in CWPT.	Class meets to review daily progress. Each student makes a positive statement about his partner's teamwork that day.	Emphasis on working together, group goals, verbalizing specific positive attributes of partner.
Generalization of Positive Partner Skills	Not included in CWPT.	Students practice tutoring skills in a center activity using different flash cards & abbreviated format.	Common stimuli Natural contingencies Program of sequential modification.

CHAPTER 3 – METHOD

Participants

Six teachers who worked with elementary students with severe EBD at a public separate school located in a small southeastern city were invited to take part in this study. During the first week of the 2003-2004 school year, they each received a written summary of the TOPS intervention, a letter outlining procedures and general requirements of the study, and a 10-item questionnaire (see Appendix A). On September 3, I met with four teachers to explain more about the intervention and how it could be incorporated in their classrooms.

Teacher

After this meeting, one teacher volunteered to participate in the study. She was a 40-year-old European American with a master's degree in school counseling. She was certified in EBD and language arts and has taught at this school for the last four years. After she agreed to participate, we met several times during September and October 2003 to review the intervention procedure in more detail and to discuss how TOPS would be implemented as a supplement to academic instruction in her combination fourth-fifth-grade classroom. The teacher indicated through these conversations and her written responses on the Teacher Questionnaire (see Appendix A) that five of six of her students were working at least two years below grade level in language arts and math and that she would be amenable to a three-times-a-week remediation program for the whole class. She also stated that her

students had used flash cards for math drills, but they had not participated in center activities this school year.

Paraprofessional

The classroom paraprofessional, a middle age European American female, had worked at the school for 10 years. She had completed one year of college coursework. She was present during most of the TOPS sessions, although she was absent from school the week of student training. During TOPS sessions, she monitored students from her desk.

Students

Whole Class Participation

In October 2003, approval for the study was granted from the Institutional Review Board of two universities and the local county superintendent for curriculum. Afterwards, all six students were invited to participate in TOPS. They were told TOPS was a new learning game and that their participation would be helpful to see how it worked. Consent forms explaining the intervention (see Appendix B) were sent to all parents and three days in November were set aside to meet with them and provide more information about the program. Although no parents attended these sessions, all consent forms were signed and returned by mid-November. Student assent was attained from all students before the intervention began.

The six students ranged in ages from 10 years 8 months to 12 years 9 months and were all eligible for free or reduced-priced lunch. Five students were performing well below grade level. Two African American males, Jamar and Cody, were identified with autism and mental disabilities and were working at the

kindergarten level. A third student, Angie, an African American female, had a primary identification of MD and a secondary identification of EBD. She was completing 2nd –3rd grade work. Dan, an African American male identified with EBD, had behavioral and relationship problems, but was working at his age-appropriate grade level. Soon after the TOPS intervention began, he started transitioning to a separate 4th grade class in a general education school.

The remaining two students, Walt and Ron, were African American boys who were both eligible for special education by meeting federal and state criteria. Both students had a primary identification of Severe EBD and a secondary identification of EBD.

Criteria for Matching Students

The teacher formed three dyads by matching students for comparable levels of cognitive ability, academic need, social skills development, and compatibility. Two sets of students (i.e., Jamar – Cody and Walt –Ron) were well matched academically and socially. The students in the third dyad, Angie and Dan, were not on the same ability or achievement level, although they worked well together. The flash card activities were modified for each pair and the entire class participated in the reciprocal tutoring and group contingency components of the program. They all received math probes, although because of the parameters established for this study, documented academic and social deficits and IQ scores above 70, and limited resources and time, social behavior data were collected for the target dyad only.

Target Dyad

Academic and behavioral characteristics. The target students, Walt and Ron, were both in the 4th grade for a second year. According to state curriculum guides and achievement scores, they were both completing work at the 1st – 2nd grade level in mathematics and language arts.

Walt was 11 years – 2 months old when the study began. His academic ability score (full scale, 77; *Wechsler Intelligence Scale for Children – Third Edition*, WISC – III, Wechsler, 1991) was commensurate with his achievement scores (decoding 69, spelling 66, math computation 84; *Kaufman Test of Educational Achievement*, K-TEA, Kaufman & Kaufman, 1998). Scores on a teacher-rated emotional behavioral scale (*Scale for Assessing Emotional Disturbance*, SAED, Epstein & Cullinan, 1998) indicated substantial problems in inability to learn (98th percentile), interpersonal relationships (91st percentile), and unhappiness or depression (98th percentile).

Walt was described in his current Individualized Education Program (IEP) as being easily frustrated and sometimes volatile. His disruptive behavior seemed to be related to attempts to avoid schoolwork. His noncompliance ranged from quiet refusals to tantrums. His strengths were listed as responding well to one-to-one instruction, being eager to please adults, and occasionally interacting with peers without redirection.

Ron was 10 years - 8 months old when the study began. His math achievement score (75) was commensurate with his ability score (composite 76; K-BIT, Kaufman & Kaufman, 1990), although his reading score was 21 points lower (reading 55; *Diagnostic Achievement Battery – 3*; DAB-3, Newcomer, 2001).

Subscale scores on the SAED (Epstein & Cullinan, 1998) indicated substantial problems in inability to learn (98th percentile), interpersonal relationships (91st percentile), inappropriate behavior (98th percentile), and unhappiness or depression (95th percentile). He was diagnosed with ADHD and was prescribed 20 mg of Adderall XR daily.

Ron's strengths described in his current IEP included being able to verbalize class rules and his own inappropriate behaviors, working well one-to-one, and drawing. He was also described as oppositional, physically and verbally aggressive, and sometimes threatening to peers and teachers.

Participation in TOPS. Walt and Ron worked as tutoring partners consistently throughout the first five weeks of the study. Walt began transitioning to a separate classroom in a general education school during Week 6 of TOPS. He started the school day at his new school and returned to his old school (i.e., target school) at 11:30 a.m. during Weeks 6 and 7. By the end of Week 8, he spent all but one-and-a-half hours a day in his new classroom. He was present for an afternoon follow up in Week 9, but not Week 10.

Even before Walt's transition began, there were times during the study when one target student was not available for TOPS. When this happened, the remaining target student was paired with either Angie or Dan. Reasons for absence included illness and behavior problems necessitating timeout from TOPS. Ron experienced both nonseclusionary (i.e., sit-and-watch) and seclusionary (i.e., timeout room) timeout during the intervention. Walt was assigned seclusionary timeout during the afternoon of the first day of his transition and was unable to participate in TOPS.

Setting

Classroom Management

The classroom in which the study was conducted was one of six in a public separate school for elementary students with severe EBD. Behavior management strategies included posted rules (*Keep hands, feet, objects to myself; Raise our hands before we speak; Use polite language*), daily point sheets, and weekly reinforcers including field trips and Fun Friday videos. At the end of each school day, the teacher or the paraprofessional summarized students' behavioral progress and sent home these reports. Students who maintained appropriate behavior throughout the week were rewarded with a visit to the local YMCA on Thursday afternoons. Students were fined five minutes of swim time for each day they did not bring their behavior reports back with a parent's signature.

Academic Instruction

Academics were individualized for all students. Each student was assigned math and language arts written work according to his specific achievement level. Every student had a 0–20 number line taped to his desk. Spelling assignments followed a traditional weekly format: write each word 10 times; copy definitions from the dictionary; use each word in a sentence; test at the end of the week. The teacher and the paraprofessional were available to answer questions and assess students individually throughout the school day.

Physical Arrangement

The six student desks were placed in one-half of the classroom. The desks were situated so students did not face each other. During TOPS, one person in

each dyad moved his desk to face his partner's desk. The three pairs were spread apart within this area.

Two large desks, one for the teacher and one for the paraprofessional, divided the room. The portion of the classroom behind the teacher desks contained a table with three computers, a storage area, student lockers, extra chairs, and one large round table. The entrance to the 4' by 5' timeout room was beside the paraprofessional's desk.

Settings for TOPS

TOPS Time

This study took place in two settings within the classroom at two different times within the school day. TOPS Time refers to the classroom setting in which the TOPS academic intervention took place. The program was taught during an early morning period before breakfast, 8:45 – 9:15 a.m. Students arrived at school at 8:30. When they entered the room, they were instructed to sit quietly at their desks and begin copying a journal-writing prompt from the board. Examples of prompts included “During the ice storm I ...” and “I can have better behavior today by...” The schoolwide morning announcements were heard at about 8:45 every morning. During the first five weeks of the study, TOPS Time began immediately after announcements and continued until breakfast time. After Walt's transition began in week six, TOPS Time started as soon as he arrived from his new school, around 11:30 a.m.

Center Time

Center Time, the student-directed academic activity using flash cards, took place after lunch, around 12:30. The large round table in the back of the classroom was used for these sessions. It was separated from student desks by two teacher desks and a computer table. Before TOPS, the class did not have center activities, so there were no educational materials or posted rules in this area.

Materials

Overview

Procedural aspects, coach and player practice cards, partner evaluation forms, group contingency token economy, and generalization features were created to address academic and social behavior needs of elementary students with EBD. After students learned the rules and procedures of TOPS in a 4-session training phase, they spent about 20 minutes three or four mornings each week taking turns acting as tutor and tutee in an academic flash card activity. The final 10 minutes of each session was spent meeting with partners to self-assess, and meeting with the whole class to report academic and behavioral progress. Later during the day, students were tested on the flash card material. Additionally, dyads participated in a center activity based on TOPS procedure, but involving a different set of flash card facts. At the end of each week, earned academic and behavioral points were traded for activity and tangible reinforcers. Next, materials used in two settings, TOPS Time and Center Time, are described (see Appendix C and Appendix D).

TOPS Time

Partner and Teacher Forms and Folder

Each dyad shared a Partner folder. Student names, TOPS rules, and a list of Positive Partner Skills were printed on the front cover. Materials necessary for each tutoring session were inside each folder. These included: (a) Coach Practice and Score card, (b) Player Answer card, (c) Partner Checklist (self-assessment), (d) teacher Star (point) card, (e) a list of tangible reinforcers and the cost of each, and (f) 10 math or spelling flash cards (see below).

Abbreviated Partner and Teacher Forms

After five weeks of the TOPS intervention, the teacher requested a simplified version of Coach and Player practice and answer cards and student and teacher assessment and scoring forms. The original forms were modified and combined to meet this request. The Partner Checklist was discontinued and a shortened partner assessment and scoring rubric were added to the Coach card. A master form assessing behavior of each pair during TOPS replaced individual teacher Star cards.

Cue Card

A triangular prism-shaped cue card sat on each dyad's desk during TOPS Time. Each side provided visual prompts including (a) sequential list of coach procedures, (b) steps for working out a problem, and (c) request for teacher help.

Public Posting

Four posters were attached to the TOPS bulletin board: (a) How to Earn Stars, general participation rules and specific coach and player expectations; (b) Reach for the TOPS, whole group contingency record of progress; (c) TOPS Points,

daily and weekly posting of partner points; and (d) TOPS Store, list of tangible reinforcers and the cost (points) of each. Student art, photographs, and generalized positive statements were added to the display during the two-month intervention period.

Flash Cards

Pre-packaged flash cards were used for practice and tutoring rounds of TOPS. For math, the problem was displayed vertically on one side and the problem and answer were displayed vertically on the other side. Spelling flash cards displayed a color photograph of a word on one side and the written word on the other side.

Academic Probes

Math probes were generated on the computer by randomly selecting 20 addition and subtraction problems from designated fact-families (i.e., addition, 7s and 8s; subtraction, 5s and 6s). Each 1-minute probe presented either all addition problems or all subtraction problems. A digital kitchen timer was used to track 1-min probes. The spelling probes, Spell I and Spell II, consisted of two 10-word sets. Each target student was provided a piece of lined paper on which to write the words. See Appendix F for examples of addition and subtraction probes and a list of both spelling word sets.

Center Time

Cue Cards and Procedural Check

Initially, Center Time materials were minimal, consisting only of one TOPS Time cue card (see above) and the Center Time flash card set (see below). During

Week 7, two prompts were added: (a) Short Game cue card (list of coach procedure, steps for working out a problem, and a request for teacher help); and (b) Coach Check card, a procedural self-assessment form (see Appendix D).

Flash Cards

Two sets of flash cards were used during Center Time, one during TOPS Time baseline and a second during the three TOPS Time intervention phases. During TOPS Time baseline, Center Time flash cards were spelling words selected from the pre-packaged set but not included in subsequent TOPS spelling intervention. After TOPS Time intervention began, author-made flash cards were used in Center Time for a US state drill (see Procedures, *Center Time* below). On one side of each card was a cut-out of two or three adjacent Southern states with the target state outlined in black marker. On the other side was the name and abbreviation of the target state.

Procedures

Procedural elements and selected events during the study are listed according to experimental phase in Table 7 at the end of this section.

Pre-Baseline

During Fall 2003, I visited the target classroom nine times. The teacher and I discussed TOPS procedure and the pairing of students by academic and social strengths and needs. During a meeting in December she mentioned that Dan was scheduled to begin his transition to a new school in late January. She also stated that the multidisciplinary team was considering a change in setting for Walt, but a plan and timeline for his transition had not been established.

Also, during pre-baseline, academic areas were selected for flash card activities during TOPS Time and Center Time based on student achievement level (basic math facts) and age- and grade-appropriate instruction (US states). Additionally, these classroom visits provided an opportunity for the students to become familiar with me. On each occasion, we talked individually and as a group.

Baseline

TOPS Time

Before TOPS training began, students participated in a journal writing activity every morning between 8:30 and 9:00 (see *Setting*). The expectation for all students was to copy the prompt from the board before breakfast. The teacher reported there was frequent resistance to completing this assignment in a timely manner. Students continued to work on the journal-write after breakfast. They were assigned individualized math and language arts worksheets after they finished the writing activity.

Academic Probes

Beginning January 9, 2004, I spent 1-2 hours in the classroom three afternoons a week (Tuesday, Wednesday, and Friday). Each session began around 12:30. First, I administered timed math probes to the whole group. All probes lasted 1 minute, although the testing content and number of problems were student-specific (e.g., Jamar and Cody received ten 1s-2s addition problems). The target students, Walt and Ron, received 20-item addition and subtraction probes. The spelling probes for both target boys consisted of two 10-word sets (see Appendix F).

Center Time Academic Activity

The teacher's planning period was from 12:30 to 1:00. Before she left the classroom, she assigned individual worksheets to all students. Some days she allowed students to sit together. Each student had different work, so there was no occasion to work cooperatively or share answers.

During this independent practice, student pairs participated in the Center Time academic activity. I called dyads to the round table in the back of the classroom, the designated Center Time area, in sequential order according to their morning behavior. Each dyad was presented with an easy flash card activity. During baseline, the classroom teacher selected known skills for each pair of students (see Table 7). Students were reminded to follow classroom rules as they sat next to each other at the table. Then they were given 10 cards and cursory instructions for the flash card task (e.g., "Show the picture side of the card and say, 'What is the first sound in this word?' ").

Fun Friday

During baseline, students who maintained good behavior throughout the week were allowed to watch a video on Friday afternoon. Those who were not eligible to participate were given additional worksheets to complete at their desks.

Training

Learning How To Play TOPS

Three 30-minute early morning sessions were planned to introduce and teach TOPS. A fourth session was necessary in order to teach students all the components of the intervention. During these sessions, students learned the rules

and procedures of TOPS. Math-fact flash cards of a known level (i.e., very basic addition facts) were used to demonstrate how to (a) take turns as Coach and Player, (b) fill in answer cards, and (c) record correct answers. Students were taught to follow procedure by reading the Coach cue card and practicing each sequential step. They were instructed how to assess their progress and complete the Partner Checklist. They were also shown how to make positive statements about their partners' behavior in the group meeting that concluded the TOPS session. As each TOPS procedure was introduced, the teacher and I modeled it. Afterwards, student dyads practiced each step. Additional instruction and practice were provided as needed. See Appendix C for Coach and Player cards and Appendix E for outline and fidelity checklist of objectives and materials for each Training Day.

Academic Probes

During training days, the procedure for administering academic probes was identical to the baseline condition. See the description above for details.

Center Time Academic Activity

During training days, the procedure for Center Time academic activities was identical to the baseline condition. See the description above for details.

TOPS Time

Set-up

TOPS was implemented three or four mornings a week. After baseline and training, each TOPS session began with a quick review of rules and procedures. Students sat with their partners and received their TOPS folder. Students took turns from day to day being the Coach in the first round. The designated 1st Coach took

the following items from the folder and placed them on the desk: (a) blue Coach Practice and Score card, (b) yellow Player Answer Card, (c) procedural cue card, (d) teacher Star card, and (e) 10 math or spelling flash cards. The 1st Coach wrote his name on line marked “1st Coach” on the blue Coach card, and folded it along the dotted line down the center. The 1st Player wrote his name on the line marked “1st Player” on the yellow Player card and folded it along the dotted line down the center.

Practice Round

This warm-up led by the 1st Coach gave both students an opportunity to practice math or spelling facts before answers were recorded. The Coach held up each flash card, one at a time, so the answer was visible to both and said, “Let’s say these together.” Both students then read each of the 10 problems and answers. This review lasted no longer than 1 minute.

Partner Round

The tutoring activity was called *Partner Round*. The 1st Coach held up the first flash card so the Player could not see the answer and asked, “What is $2 + 3$? ” or “Spell *phone*.” If the Player’s oral response was correct on the first attempt, the Coach said, “Yes! $2 + 3 = 5$. Two points. Let’s say it.” They both repeated the fact. The Coach circled the 2 in the column labeled “1st Player Correct 1st Try” on the Coach Practice and Score Card (see Appendix C). If the Player gave an incorrect answer, the Coach said, “No. $2 + 3 = 5$.”

Next, the Coach said, “Let’s write it.” Both students then wrote the problem and its answer on Line 1 of their respective cards (i.e., blue Coach card and yellow Player card). Finally, the 1st Coach said, “Let’s read it.” He pointed to each number

(or letter for spelling) as they both repeated the fact (or letters in a word) one last time. After each sequence, the Coach gave positive feedback by saying, “Great job!” or another phrase expressing good effort. These steps (i.e., Say, Write, Read, Great Job!) were written on the Coach card in sequential order. He circled each one after he performed each task.

This sequence was repeated for each of five flash cards. Students then switched roles and exchanged cards (i.e., the second Coach took the blue card and wrote his name on the line marked “2nd Coach”). The new Coach reversed the cue card so he could see the sequence of directions. He then repeated the same procedure for flash cards 6 -10.

Typically during the tutoring sessions, I monitored the target dyad and the teacher helped Jamar and Cody. On most days the third dyad, Dan and Angie, worked without teacher assistance. All students were given social reinforcement and stickers were added to teacher Star cards for specific observed positive partner behaviors.

Partner Assessment

After the flash card portion of TOPS, partners assessed themselves by reviewing and rating their performance in following general TOPS rules and specific Coach and Player behaviors. They marked the 10-item Partner Checklist (see Appendix C) with 2 (*Yes*), 1 (*Some of the time*), or 0 (*No*) for each behavior. Scores ranged from 0 to 20, with higher scores indicating more positive assessment. To reinforce honesty, bonus points were awarded to student partners whose peer-

assessment closely matched adult assessment as reflected on the teacher Star card.

Next, Partner Checklist points were added to teacher Star points and academic and procedural points earned during the Partner Round. Dyads were assisted in calculating an overall total for the session.

Group Meeting

The last 5 minutes were spent reporting points, making positive statements, reviewing group performance, and setting goals for the next session. Each student made a brief specific statement about a positive aspect of his partner's performance (e.g., "Today I liked the way Walt gave me good feedback."). Partners announced their total score for the session. All partner points were added for a group total. The high-scoring partners colored in the daily total on the interdependent group contingency chart, Reach for the TOPS (Appendix C). It was decided at the beginning of each week the number of points necessary for the class to have a TOPS party.

Center Time

Academic Probes

During TOPS Time intervention days, the procedure for administering academic probes was identical to baseline and training day conditions. Each afternoon session began with a 1-minute math probe according to individual levels and the type of problems practiced in the morning session of TOPS. Spelling probes were given to the target dyad only. During intervention, students received two points toward the TOPS store for every correct answer on the probes.

US States Lesson

On the afternoon of February 3, 2004, the first day of TOPS Time addition intervention, I taught a 20-minute whole group direct instruction lesson on states in the union. Subsequent Center Time flash cards and other activities (e.g., Jamar and Cody worked with a US map puzzle) dealt with identifying and locating US states.

Center Time Academic Activities

The Center Time academic activity procedure during intervention phases (i.e., Addition, Spell I, Spell II) was identical to baseline and training day conditions. Students were called to the back table, given 10 cards, and instructed to practice the academic activity. They were allowed to use a US map to answer flash card questions, which varied each week (e.g., find the state, name the state; see Table 7). A TOPS Time cue card was on the table, although students were not instructed to use it or Player or Coach written answer cards. I sat on the opposite side of the table, but did not interact with the dyad unless asked a question or unless negative behaviors escalated to an unacceptable level. I avoided eye contact with the students and surreptitiously recorded their positive and negative tutoring behaviors on a form in my lap (see Appendix E, Center Time Recording Form).

TOPS Fun Friday

When students earned enough academic and behavioral points to meet the conditions of the group contingency, a TOPS party was held. Students were polled during pre-baseline for preferences for edible and tangible reinforcers; and accordingly, a TOPS store was stocked with small toys including motorcycles, stuffed animals, beads, colored markers, little books, and soap bubbles. Fun Friday

edibles included pizza, ice cream, and gummy worms. During three Fun Fridays, students participated in art activities with a positive partner skills theme.

Table 7 Chronology of TOPS

Date	Phase & Days	Academic Probes	Center Flash Cards	Selected Events
Sept 3, 11, 19, 22 Oct 14 Nov 12-14, 24, Dec 2	Pre-Baseline	Visited classroom to discuss intervention and observe students. Discussed academic and social levels with teacher. Decided on math and spelling probes and paired students according to ability and compatibility.		
Week 1 Jan 9, 13, 14, 15, 16	Baseline Days 1-5	Addition 7s – 8 s Subtraction 5s – 6s Spell I, II	Center 1 st & last sounds Walt & Ron Days 4 & 5	Students frustrated with timed math probes, but willing to participate. Day 1- Ron to TO ¹ , not TOPS-related. Center - Walt-Ron taunted each other when either missed an answer.
Week 2 Jan 20, 21, 22, 23	Training Days 6-9	Easy Add 2s – 3s Probes continue	Center Blends Walt & Ron Day 6	Day 6- Student Verbal Assent Days 6 - 8 Training- very slow. Day 9 – Fun Fri. Decorate TOPS hats. Ron didn't get the red hat - to TO ¹ , removed from class by officer.
Week 3 Jan 29, 30	Training Days 10-11	Probes continue	No Center	Ice Storm – no school M-W. Day 11 - Finished training. Fun Fri. - Reach for the TOPS group contingency pizza party. Pre-intervention survey for students & teachers.

Table 7 (Continued)

Date	Phase & Days	Academic Probes	Center Flash Cards	Selected Events
Week 4 Feb 3, 4, 5, 6	TOPS Addition Days 12-16	Addition Spell I, II Subtraction	Center Find states on US map Walt & Dan Day 12	Day 12- First day of TOPS Add; Center - US states direct instruction lesson. Ron to TO ¹ after not FD ² during states' activity. Day 15-Fri-Walt & Ron unsettled; refused to follow TOPS protocol; Fun Fri.-TOPS party & store in afternoon. Extend Add to Tues, 2/10.
Week 5 Feb 10, 11, 12, 13	TOPS Spell I Days 17-19	Addition Spell I, II Subtraction	Center ID States Use US map Walt & Ron Days 16, 18, 19 Teach TOPS Short Game	Good 3 days-consistent schedule & performance. Teacher reports Ron encouraged Cody in cafeteria with positive statement & thumbs up. Walt helped Jamar at YMCA. Day 18 Center –Walt & Ron continue to argue. When redirected, Walt said: "I didn't think we were using those rules." Day 19-Explicit instruction in TOPS for Center Time; Short Game rules. Fun Fri.- TOPS store & party. Ron offered to buy Angie toy from store. Walt gave his toy to Cody, chose another for himself.
Week 6 Feb 17,18	TOPS Spell II Days 20-21	No Probes	No Center	Change to TOPS abbreviated forms. Day 20-Walt to new school in a.m. Walt & Ron in TO ¹ in p.m. Officer called. Teacher led TOPS 2/18 No probes given. No school 2/19 & 2/20.

Table 7 (Continued)

Date	Phase & Days	Academic Probes	Center Flash Cards	Selected Events
Week 7 Feb 25, 26, 27	TOPS Spell II Days 22-24	Addition Spell I, II	Center ID States TOPS Short Game Walt & Dan Day 23	Field trip 2/24 – no TOPS. Ron absent Day 22; Day 23 slept at desk in a.m.; in TO ¹ during TOPS p.m. (unrelated). Center - Walt & Dan; 0% negative behavior after reviewing Short Game. Day 24-Good TOPS session. First time Walt & Ron partner since Day 19; 100% procedural fidelity. Fun Fri., but para says no TOPS store for Ron or Walt because of noncompliance & physical aggression Day 23 after TOPS.
Week 8 March 5	Follow Up Day 25	Spell I, II	Center ID States TOPS Short Game Walt & Angie	No Walt Mar 2-4; Ron absent Mar 2- 3; Mar 4 - sleeping on floor. March 5- Fun Fri.-TOPS store-spend points earned last week. Closure activity. Ron can't participate-hasn't finished work; misbehavior escalates; TO ¹ out of room; behavior continued; restrained; officer called. No probes-Ron. Post TOPS survey-teachers & Walt, Angie, Dan.
Week 9 March 10	Follow Up Day 26	Subtraction	Center ID States TOPS Short Game Walt & Dan	March 8-10 Ron did not participate in a.m. TOPS. Walt at new school. March 10 Center - Walt & Dan used coach check forms. TOPS store - Walt, Dan, & Cody.

Table 7 (Continued)

Date	Phase & Days	Academic Probes	Center Flash Cards	Selected Events
Week 10 March 18	Follow Up Day 27	Addition	No Center	Teacher did not use TOPS this week. Walt & Dan at new schools. TOPS store in afternoon for Cody & Jamar. Ron had to wait until next week because of misbehavior. Ron Add probe.
Week 11 March 26	Check-In			Teacher did not use TOPS this week. Afternoon check-in. All watching TV except: Ron in TO¹ & Angie head down at center table. Walt reported progress at new school & commented: "I been missin' you and those TOPS parties."
<i>Note.</i> 1. TO = Seclusionary Timeout; 2. FD = Follow Teacher Direction.				

Dependent Variables

Dependent variables included measures of academic performance and social behavior in two settings. Academic probe scores were recorded in afternoon sessions before Center Time. Positive and negative tutoring behaviors were recorded during Center Time academic activities.

Academic Probe Scores

The classroom teacher chose addition, subtraction, and spelling for remediation with TOPS. Because the target dyad had similar math and spelling objectives and were working at the same grade level, they received the same math and spelling probes: sevens and eights for addition, fives and sixes for subtraction, and four- and five-letter words for spelling (see Appendix F). Probes were given for the target academic behavior (i.e., TOPS intervention) every Center Time day. The other academic behaviors were probed intermittently.

Math Probes

After reviewing baseline and the first days of addition probes for the target students, it was decided that the number of problems on subsequent tests would differ for the two students according to their achievement on earlier probes. Beginning with Day 16, Ron's addition probes consisted of 25 problems each and Walt's addition probes consisted of the first 15 of these 25 problems. Subtraction probes remained at 20 problems for both students because of relatively similar subtraction probe scores.

Spelling Probes

The spelling probes for the target students contained 10 words each from two flash card sets (i.e., Spell I and Spell II). I called out the words with no longer than 30 seconds latency between each one.

Center Time Social Behavior

During the afternoon Center Time flash card academic activity, positive and negative tutoring behaviors were recorded for target students according to (a) Coach behavior, (b) Player behavior, (c) Partner behavior and (d) overall Center Time social behavior. Absence of either positive or negative tutoring behavior was recorded as *not observed*. Also, the frequency of student redirection was recorded for each session (see Appendix E).

Positive Tutoring Behavior

Positive tutoring behavior consisted of appropriate comments and actions exhibited by the coach and the player during the Center Time academic activity. These behaviors were listed several times throughout TOPS (see Appendix C) and were taught, practiced, and reinforced in the morning TOPS Time sessions. They included:

Positive Coach Behavior

- ❑ Give clear directions.
 - Verbal - Ask the question.
 - Action - Show the card.
- ❑ Give good feedback.
 - Positive – “Good Job!”
 - Corrective – Say “no” and say the correct answer.

Positive Player Behavior

- ❑ Answer quickly.
- ❑ Accept feedback politely.

Positive Partner Behavior

- ❑ Try to work it out before asking for teacher help.

Negative Tutoring Behavior

Negative tutoring behavior consisted of negative comments or actions exhibited by the coach or the player during the Center Time academic activity. They included:

Negative Coach Behavior

- ❑ Give directions using rude, bossy, or disrespectful words or voice tone.
- ❑ Give bad feedback (e.g., laugh at wrong answers, tease, or taunt).

Negative Player Behavior

- ❑ Talk back when given clear directions.
- ❑ Refuse to follow appropriately given directions.

Negative Partner Behavior

- ❑ Argue with partner.

Recording Methods and Interobserver Reliability

Academic Probe Scores

Math and spelling probes were given in written format. Addition and subtraction problems were presented in author-made 1-min tests. Students were provided lined paper on which to write spelling words. I called out each of 10 words per probe at a rate one word every 30 seconds. Number correct was calculated for every math and spelling probe (see Appendix F).

I was the primary scorer and a colleague at the university served as the second scorer for all academic probes (i.e., addition, spell I, spell II, subtraction).

Percent of inter-scorer agreement was calculated for 20% of each set of academic probes by dividing the smaller score by the larger score and multiplying the results by 100 (Alberto & Troutman, 2003). Because of the permanent-product nature of this assessment, a standard for interscorer reliability was set at 100%. Any deviation from total agreement was reexamined and, if necessary, rescored. Agreement across addition, spelling, and subtraction probes for both students was 100%.

Center Time Social Behavior

Event recording was used to track positive and negative tutoring behavior during the Center Time flash card academic activity (see Appendix E, Center Time Recording). Frequency of each behavior was calculated as a percentage of the total observed behavior (Kazdin, 1989). Also, percentages were calculated separately for Coach behavior (i.e., give good feedback) and Player behavior (i.e., accepts feedback politely) for target students and their partners.

I was the primary observer and the teacher served as the second observer for 20% of the sessions. Percent of interobserver agreement (IOA) was calculated by comparing each flash card trial by three social behavior choices (i.e., *positive*, *negative*, *not observed*) for both participants, then dividing agreements by agreements plus disagreements and multiplying the results by 100. An IOA percentage was attained for each student's positive, negative, and not observed Coach and Player behavior. Overall IOA for both students across Coach and Player behaviors was 95%.

Procedural Fidelity

Training Days Check

The teacher and I completed checklists of procedures and materials outlined by training day (see Appendix E, Training Record & Fidelity Check) immediately after each session in order to monitor treatment fidelity (Gresham, 1997). For each procedural step, we asked, “Did the trainer...” (e.g., teach and model the steps of the Practice Round), and then we circled one of three choices: *yes*, *somewhat*, or *no*. Checklists were completed independently and later assessed for reliability.

TOPS Time Partner Tutoring Check

Two forms were used to monitor the target dyad’s procedural fidelity (Gresham, 1997), Tutoring Procedural Check – Long Form and an abbreviated version, Procedural Check – Short Form (see Appendix E). The Long Form listed every Coach and Player tutoring behavior in sequential order and was used to assure the target dyad had learned and was following TOPS protocol throughout academic intervention phases. The Short Form was developed as part of the effort to simplify behavior recording after the present study ended.

Procedure was monitored during 1st Coach – 1st Player and 2nd Coach – 2nd Player rounds. The criterion level was set at 80%. Teacher prompts and redirections were recorded on the daily procedural check form. Fidelity of the target dyad was assessed 8 of 9 sessions (89%) across three intervention phases (Addition, 4 sessions; Spell I, 2 sessions; Spell II, 2 sessions). The Long Form was used during 7 sessions. The Short Form was used only once, on Day 24, the last day the target dyad worked together during TOPS Time.

Social Validity Measures

Teacher and student versions of post training and post intervention acceptability surveys, based on instruments designed by Lane and Beebe-Frankenberger (2003), were developed for this study (see Appendix G).

Teachers

Post-Training

After four TOPS training sessions, the teacher and the paraprofessional completed the Post-Training Acceptability Survey, comprised of 14 statements concerning the potential value, practicality, and acceptability of TOPS. Each statement began with, “The TOPS intervention” and was followed by either a positively or negatively stated phrase (e.g., “will fit into our daily classroom schedule”; “is too long for most of my students to stay engaged the entire session.”). The respondents circled a number from 1 to 5 for each sentence to indicate level of agreement, ranging from strong disagreement (1) to strong agreement (5).

Post-Intervention

At the end of Week 8, both adults were given the Post-Intervention Acceptability Survey. The format and rating scale were identical to the post training survey. Some statements addressed outcomes during the intervention (e.g., “The TOPS intervention helped my students improve their peer-sharing skills.”) and others asked adults to predict acceptability of TOPS for future use (e.g., “The TOPS intervention is compatible enough with our academic and social program to continue after this project ends.”).

Students

Post-Training

After completing training sessions, Walt, Ron, and Dan were given the TOPS Student Survey (see Appendix G). The target students came to the Center Time table one at a time. The instrument was explained to them, and each of the six statements was read out loud (e.g., “The rules of TOPS are easy to follow”). Students were told there was no correct answer for any of the statements and they should honestly select one of three choices (i.e., *no*, *some of it*, *yes*) according to how they felt about TOPS after the training period. Students were asked to circle a word or phrase or the corresponding face, (a) sad face, (b) no expression, or (c) smiley face respectively, after each sentence was read. Dan completed the instrument independently at his desk.

Post-Intervention

The student post-intervention survey (see Appendix G) was similar in intent to the post-intervention teacher instrument. It replicated the format and rating scale of the student post-training survey; statements 1-6 addressed outcomes (e.g., “I learned to play the TOPS game”). Statement 7 endorsed the use of TOPS in other classrooms. Two open-ended statements were added to the post survey: “One thing I did NOT like about TOPS was...” and “My favorite part of TOPS was...” Additional explanation of statements or assistance with spelling was given if requested by the students.

Research Design and Analyses

Multiple Probe Across Academic Behaviors Design

A multiple probe across behaviors design (Horner & Baer, 1978) was used to determine if there was a functional relationship between the TOPS intervention and probe scores for two students. Three academic areas, addition, subtraction, and spelling, were chosen as target behaviors based on IEP present levels of performance, standardized test scores, and teacher recommendation.

Sequence of Academic Behavior Interventions

Although there were no firm rules for deciding the sequence in which to present interventions (Repp & Lloyd, 1980), it seemed logical to separate the two math phases by the spelling phase. Also, addition and subtraction were selected from different fact-families (i.e., 7s-8s and 5s-6s, respectively) to further differentiate the two skills. Thus, the sequence of academic intervention was (a) addition, (b) spelling, and (c) subtraction. The original spelling probe contained 20 words, but after consulting with the teacher during pre-baseline, we decided to split the list in two. Subsequently, the initial spelling condition was divided into subphases, Spell I and Spell II, thus adding another replication level to the design.

Rationale for Multiple Probe Design

Multiple probe technique is a suitable alternative to continuous measurement of dependent variables throughout multiple baselines if extended baselines prove to be reactive or impractical or a strong *a priori* assumption of stability can be made (Kazdin, 1982). In the present study, extended baselines were expected to be both

reactive and impractical. Also, in light of documented reports of stable weaknesses in students' math and spelling scores, the multiple probe design was appropriate.

Phase Changes and Data Collection

Rule for phase change. Probes were given during baseline and training in order to sufficiently establish a predictable pattern for future performance of academic variables if intervention did not occur (Horner, Carr, Halle, McGee, Odom, & Wolery, 2004). Baseline data were collected for target students until (a) a relatively stable pattern was established; (b) a descending trend (i.e., opposite what was expected during intervention) was established; or (c) baseline-training mean score for the target dyad was at or below 50% (i.e., score of 10 of 20 correct math problems, and 5 of 10 correct spelling words). After at least one of these conditions was met for at least three consecutive probes, intervention began.

Comparison to CWPT pretest rule. Greenwood et al. (1997) suggested pretest scores should range from 20% to 40% correct before CWPT began. In the present study, even though target students were matched according to academic level and probes were selected by the teacher based on documented deficits, a more lenient criterion was set to allow for slight differences in achievement between students and day-to-day variability precipitated by emotional and behavioral problems.

Baseline-Training. The 50% criterion level was met for four of five addition mean scores (range, 5.5 – 10.5 correct). Considered individually, all of Walt's addition scores were well below the cut off of 10. Although Ron's mean addition score was 12.6, the last four baseline-training scores indicated a descending trend.

Baseline-training spelling scores for both boys remained stable and mean scores easily met criterion level (range, 0 – 2 words spelled correctly) See Figures 1 and 2 and Table 8.

Interventions. Intervention terminated for one target behavior and began for the next when (a) an ascending trend was established for the target behavior, or (b) at least three consecutive target behavior mean scores for Walt and Ron were maintained above the 50% cut off mark.

Schedule for data collection. In order to demonstrate experimental control of the behavior receiving intervention and to document stability of behaviors not receiving intervention (Horner et al., 2004), students were given probes for Spell I, Spell II, and Subtraction the first day of Addition intervention (Day 12; see Table 7 and Figures 1 and 2). Likewise, students were assessed on Spell II and Subtraction the day Spell I intervention began (Day 17). Baseline data were collected intermittently on additional days for Spell I, Spell II, and Subtraction to assure continuing stability before each began intervention. Probes were also used to measure maintenance of academic behaviors after treatment was terminated (Kazdin, 1982).

Baseline-Only Control

The present study took advantage of a positive feature of using single subject methodology in applied settings: the flexibility and dynamic nature inherent in the design (Johnston & Pennypacker, 1993). As stated above, this study was planned as a multiple probe design across four academic behaviors (Addition, Spell I, Spell II, Subtraction). Two main factors necessitated a change in this plan: (a) the

unpredictability of student behavior leading to extended intervention phases, and (b) the transition of one target student to another school. Because of these and other situations beyond control (see Table 7), the fourth academic dependent variable, Subtraction scores, did not receive TOPS treatment. This was an undesirable change, but the design used in the present study still met and exceeded the minimum requirement, replication across two behaviors (Kazdin, 1994).

On the positive side, Hayes (1993) and others (Johnston & Pennypacker, 1993; Kazdin, 1982) have suggested using a baseline-only condition as a control comparison. In this study, subtraction probe data, (the fourth baseline; see Figures 1 and 2) served this function. Baseline-only dependent variables have been used as comparison measures in multiple baseline designs in academic (Fueyo & Bushell, 1998) and social behavior (DeMartini-Scully, Bray, & Kehle, 2000; Musser et al., 2001) studies.

Analysis for TOPS Time Academic Behaviors

Academic behaviors were analyzed by visual inspection for target students across baseline, intervention, and maintenance phases for each of three dependent variables. Scores for Addition, Spell I, and Spell II were analyzed according to trends, changes in means across conditions, level and latency of change across conditions, and percent of nonoverlapping data points (NDP) across conditions.

Generalization of TOPS Time Social Behavior

Center Time Setting

Social behaviors exhibited during the Center Time flash card activity were examined for target students and their Center Time tutoring partners during

afternoon sessions. This investigation explored whether positive tutoring behavior taught and reinforced in TOPS Time morning sessions would transfer to nonprogrammed activities (a) in a different setting (b) presented by different students (c) using different flash cards requiring different questions and responses. The intent of this study was to examine if the behaviors taught and reinforced in TOPS Time sessions would generalize to Center Time across setting, persons, and behavior with minimal prompting.

Systematic Sequential Modification

A continuum of “extratraining manipulations... for extratraining changes” (Stokes & Baer, 1977, p.350) was presented during Center Time. Baseline and three levels of training were designed for examining the necessity of sequential modification for generalization of positive tutoring behaviors. They included (a) TOPS Time baseline, no instruction in positive tutoring behavior; (b) TOPS Only, instruction, feedback, and reinforcement during TOPS Time tutoring sessions for addition and spelling; (c) TOPS + Short Game, all elements of (b), plus explicit instruction in Center Time rules, cue card, and procedural self-check form; (d) TOPS CENTER, all elements of (b) and (c), plus Center Time rules, Center Time Partner assessment, and token reinforcement for demonstration of positive partner skills (see Appendix D).

Positive and Negative Tutoring Behaviors

Direct observation data were collected (see Appendix E) and percentages were calculated for three behavioral variables, positive tutoring behavior, negative

tutoring behavior, and neither positive nor negative tutoring behavior, called *not observed* (see Dependent Variables above).

Walt and His Tutoring Partners

Positive and negative tutoring behaviors across partners. During the study, Walt participated in 10 Center Time sessions with three classmates. When Ron was unavailable, Walt worked with Dan or Angie. A comparison of Walt's positive and negative social behavior across tutoring partners was examined to determine similarities or differences in his interactions according to different students.

Feedback and response exchange across partners. The Coach – Player exchange of feedback - and - response was examined for Walt and his three tutoring partners across phases. Three types of coach feedback were recorded: (a) good feedback, either verbal reinforcement (e.g., “good job!”) or good corrective feedback, (i.e., “no” and say the correct answer); (b) bad feedback, laughing, taunting, teasing when partner answers incorrectly; and (c) no feedback, no comment when partner answers. Three player responses were recorded: (a) accepts feedback politely (e.g., says “thanks”); (b) argues with coach (e.g., “I did not miss it!” “Yes you did!” “No I didn’t!”); and (c) no comment, making no response after receiving either good or bad feedback.

CHAPTER 4 – RESULTS

TOPS Time Academic Scores

Walt

Visual inspection of Walt's academic scores (see Table 8 and Figure 1) clearly indicates a substantial gain from baseline to intervention and maintenance phases for addition and both sets of spelling words. Subtraction scores remained stable throughout baseline probes with a mean score of 5.4 correct. The range for 7 subtraction scores was 3 -7 correct (40% variability); the range for 6 of these scores was 5 -7 correct (15% variability).

Addition

In addition, the baseline mean score was 2.6 problems correct during 1-minute probes. The intervention mean was 7.4 problems correct in 1 minute. The maintenance phase (i.e., no TOPS treatment) scores across seven days following intervention remained unchanged, with a mean of 7.7 problems correct in 1 minute. A change in level was not demonstrated between the last day of baseline (5 correct) and first day of addition intervention (5 correct), although the latency period was short. By the second day of treatment, number correct increased by 80%, from 5 to 9 correct. There were 60% NDP (3 of 5 scores) between baseline (range, 1 - 5 correct) and intervention (range, 5 - 10 correct). The overlapping data point (5 correct) was scored twice and it was the highest baseline score. There were 100% NDP between baseline scores and maintenance scores (range, 6 – 10 correct).

Spell I

In Spell I, baseline mean scores across 4 probes was 0.3 word spelled correctly. During Spell I intervention, a mean of 7.7 words were spelled correctly. Maintenance mean score was 6.5 words spelled correctly. Level of change between the last day of baseline and first day of Spell I was considerable, with scores of 0 correct and 5 correct, respectively. The score on the last day of Spell I intervention was higher by 2 words than on the first day of maintenance, 9 words correct and 7 words correct, respectively. There were only 2 maintenance scores, so a trend could not be confirmed, although the second maintenance probe was lower than the first, suggesting a descending slope. There were 100% NDP between baseline (range, 0 – 1 correct) and intervention scores (range, 5 – 9 correct) and baseline and maintenance (range, 6 – 7 correct) scores.

Spell II

Similar gains from baseline to Spell II intervention phases were evident. Baseline mean scores across 5 probes was 0.6 word spelled correctly. During Spell II, a mean of 6.6 words were spelled correctly. The one maintenance score was 7 words spelled correctly. Level of change between the last day of baseline and first day of Spell II was comparable to Spell I, with scores of 0 correct and 4 correct, respectively. The score on the last day of Spell II intervention was higher by 2 words than on the first day of maintenance, 9 words correct and 7 words correct, respectively. There were 100% NDP between baseline (range, 0 – 2 correct) and intervention (range, 4 – 8 correct) scores and baseline and maintenance (1 probe, 7 correct) scores.

Ron

Although because of behavior problems, Ron did not participate in afternoon academic probes as frequently as Walt (see Table 7), visual inspection of his academic scores (see Table 8 and Figure 2) clearly indicates he, too, made substantial gains from baseline to intervention phases for addition and spelling variables. Like Walt, Ron's subtraction scores remained stable throughout baseline probes with a mean score of 11.2 correct. The range for 6 scores was 10 - 14 correct (25% variability).

Addition

In Addition, the baseline mean score was 12.6 problems correct during 1-minute probes. The intervention mean was 19.6 problems correct in 1 minute. The maintenance phase (i.e., no TOPS treatment) scores declined slightly, with a mean of 19 problems correct in 1 minute. There was a substantial change in scores between the last day of baseline and first day of addition intervention, number correct increased by 120%, from 9 to 19 correct. There were 80% NDP (4 of 5 scores) between baseline (range, 9 - 17 correct) and intervention (range, 17 - 23 correct). There were 75% NDP (3 of 4 scores) between baseline and maintenance (range, 16 - 22 correct) scores.

Spell I

In Spell I, baseline mean scores across 4 probes was 0.3 word spelled correctly. During Spell I intervention, a mean of 8.7 words were spelled correctly. There was only one maintenance score, 8 words spelled correctly. Level of change between the last day of baseline and first day of Spell I was considerable, with

scores of 0 correct and 8 correct, respectively. There were 100% NDP between baseline (range, 0 – 1 correct) and intervention (range, 8 – 9 correct) scores and baseline and maintenance scores.

Spell II

Ron's gains from baseline to Spell II intervention phases were similar to Spell I results. Baseline mean scores across 5 probes was 0.4 word spelled correctly. During Spell II, a mean of 8 words were spelled correctly. There were no maintenance scores for Spell II. Level of change between the last day of baseline and first day of Spell II was comparable to Spell I, with scores of 0 correct and 9 correct, respectively. There were 100% NDP between baseline (range, 0 – 1 correct) and intervention (range, 7 – 9 correct) scores.

	Walt				Ron			
	Add	Spell I	Spell II	Subtract	Add	Spell I	Spell II	Subtract
Baseline	2.6	0.3	0.6	5.4	12.6	0.3	0.4	11.2
TOPS	7.4	7.7	6.6		19.6	8.7	8.0	
Maintenance	7.7	6.5	7.0		19.0	8.0	No probes	
% NDP Baseline to Intervention	60%	100%	100%		80%	100%	100%	

Table 8 Mean Scores and Percent Nonoverlapping Data Points

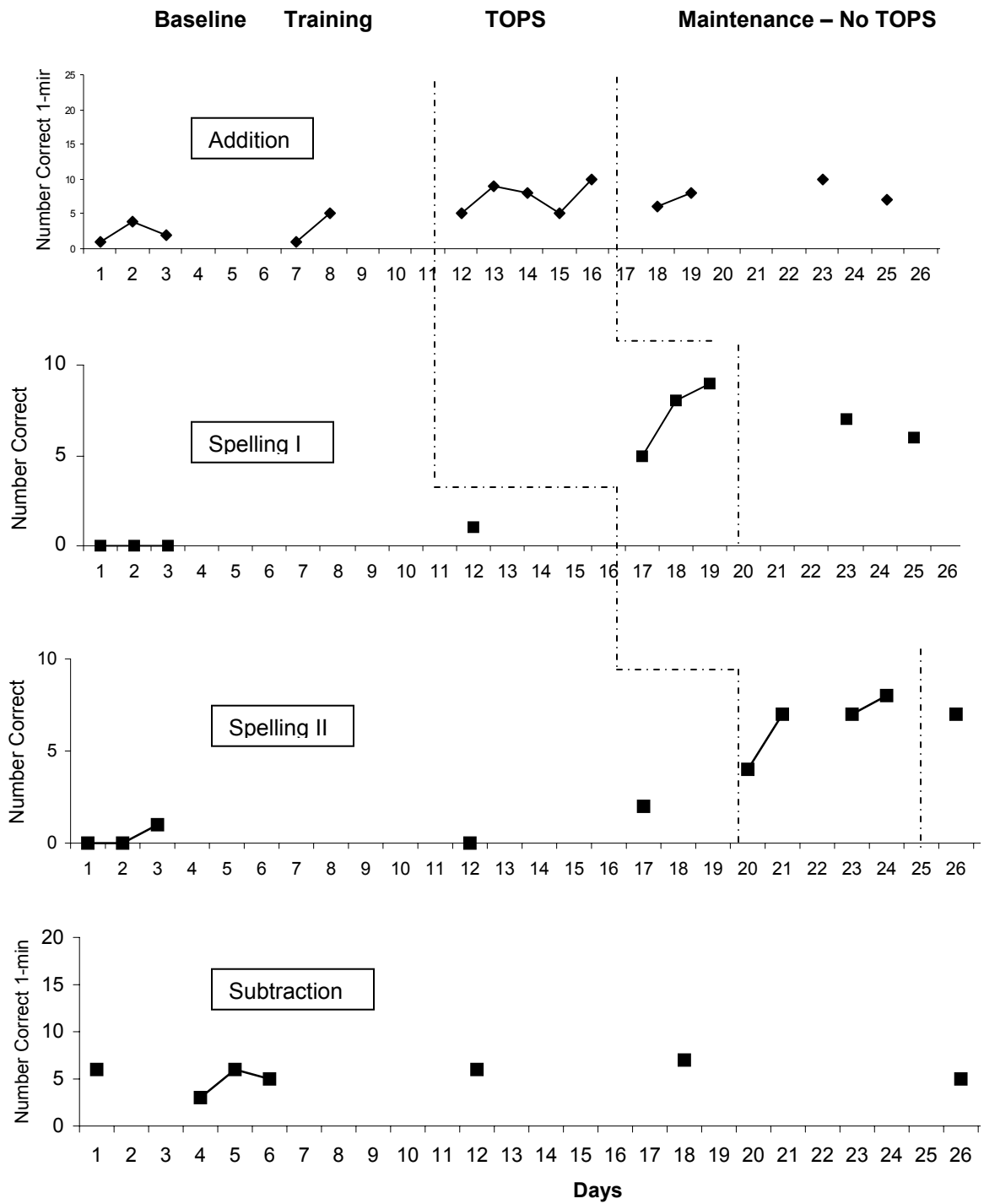


Figure 1. Walt's Academic Probe Scores.

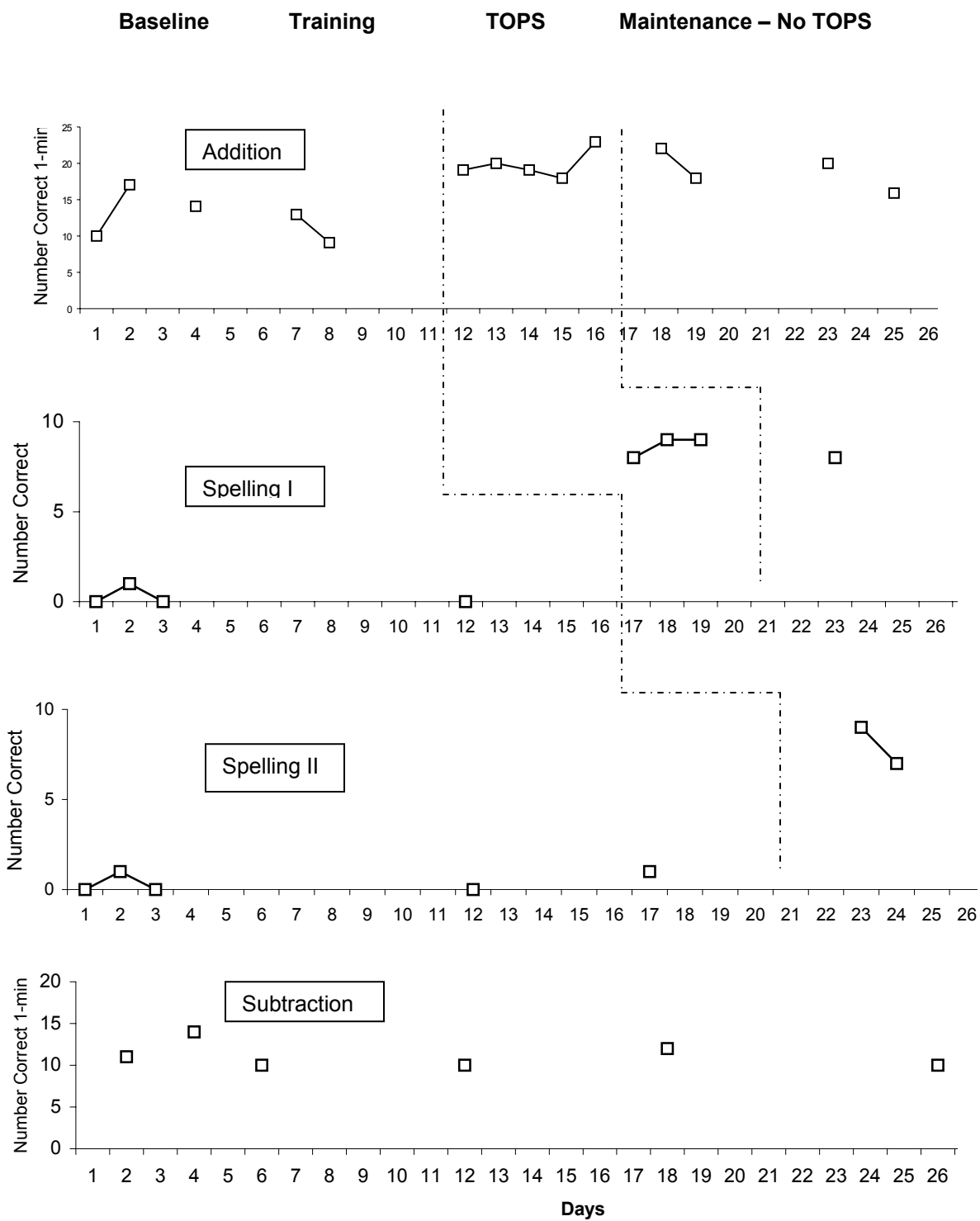


Figure 2. Ron's Academic Probe Scores.

Center Time Social Behavior

Change in Setting, Partners, and Behaviors

Center Time was held at the large round table in the back of the classroom. Walt and Ron participated as partners in Center Time six times during the study. On four additional occasions, Walt worked with other classmates, Dan (three times) and Angie (one time). Each session lasted about 10 minutes. At the beginning of each session, students were given 10 flash cards and basic instructions for the academic task. Although in TOPS Time, students were required to split the flash cards (i.e., 5 cards for each student), during every Center Time session, the 1st Coach chose to present all 10 cards. The 2nd Coach then used the same cards for the second round. See Table 7 for a description of flash card prompts used during Center Time. They varied throughout the study, but all answers were either known by the students (e.g., initial and ending sounds of 1-syllable words), or were accessible with additional cues (e.g., labeled US map for naming states).

Systematic Sequential Modification

The purpose of the Center Time activity was to determine if positive tutoring skills taught and practiced during TOPS Time would generalize to a different setting, different peer partners, and different flash card activities. Three levels of training were available for teaching transfer of positive behavior (see Table 9). During the intervention, behaviors were compared across Level 1 (baseline), Level 2 (TOPS Only), and Level 3 (TOPS + Short Game). The study concluded before elements of Level 4 (TOPS CENTER) were employed. Results of positive and negative tutoring behavior for Walt, Ron, and the other are reported next.

Table 9 Generalization Continuum for Positive Tutoring Behaviors

Level of Training for Generalization	TOPS Time Features - Plan for Generalization	Extratrainng for Changes in Center Time			Center Time Features
		<u>None</u>	<u>Some</u>	<u>All</u>	
1. Baseline		X			Instructions for flash card task No social prompt
2. TOPS Only	<u>Sufficient Exemplars</u> TOPS Rules Partner Skills Different peers Different behaviors <u>Natural contingencies</u> Social interaction Peer praise <u>Common stimuli</u> Flash cards Partners Procedural prompt <u>Peer-management</u> Coach card Partner checklist	X			Peer academic task Flash Cards TOPS Time Procedural prompt
3. TOPS + Short Game	Same as TOPS Only		X		Explicit verbal instructions Short Game cue card Coach check card
4. TOPS CENTER	Same as TOPS Only			X	Explicit verbal instructions Short Game cue card Same flash cards as TOPS Partner checklist Token economy

Positive and Negative Tutoring Behaviors

Table 10 displays Walt and his partners' coach and player behaviors during Center Time across three levels, Baseline, TOPS Only (i.e., addition and spelling TOPS Time), and TOPS + Short Game (i.e., explicit instruction in Center Time rules). Coach and Player behaviors were recorded as positive (+; e.g., gives clear directions, gives good feedback), negative (-; e.g., laughs at mistakes, argues about feedback), or not observed (0; neither positive nor negative behavior was exhibited; see Appendix E, Center Time Recording Form). Each behavior is presented as a percentage of total behavior observed. In the table, Walt's Coach behavior is displayed first for each session, although he and his daily partner took turns being 1st Coach.

Positive partner behavior was recorded if the dyad worked out a problem using the procedure taught during TOPS Time training. No incidents of *working it out* were recorded during 10 Center Time sessions.

Figure 3 presents mean percentage of positive and negative tutoring behaviors observed for Walt and Ron over six Center Time sessions across baseline, TOPS Only, and TOPS + Short Game levels. A percentage was also calculated for incidents of neither positive nor negative behavior, called *not observed*. Overall social behavior percentage was attained for students individually by averaging Coach and Player positive, negative, and *not observed* behaviors for each session (see Table 10). Figure 4 presents overall social behavior for Walt and Ron across three levels, baseline, TOPS Only, and TOPS + Short Game Rules.

Baseline

Walt and Ron participated together in Center Time academic activities on Days 4, 5, and 6. They were given flash cards and instructed to practice a skill, such as saying initial word sounds.

Walt. Across three sessions, Walt exhibited positive behavior 50% and negative behavior 9% of the time. Neither positive nor negative behavior was exhibited 41% of the time.

Ron. Ron exhibited positive behavior 43% and negative behavior 16% of the time. Neither positive nor negative behavior was exhibited 41% of the time.

TOPS Only

Walt and Ron participated together in the TOPS Only phase on Days 16 and 18. During this phase, TOPS Time rules and positive partner skills were not mentioned, although a TOPS cue card was sitting on the round table in view of both students.

Walt. Over two sessions, Walt's positive and negative behaviors increased from baseline: positive, 50% to 58%; and negative, 9% to 16%. Percentage of behavior not observed decreased, from 41% in baseline to 26% in TOPS Only.

Ron. Ron's positive behavior increased substantially from baseline, from 44% to 57%, while his negative behavior decreased slightly, from 18% to 14%. Percentage of behavior not observed decreased, from 41% in baseline to 29% in TOPS Only.

TOPS + Short Game

TOPS + Short Game began on Day 19. Students were given explicit instructions in Short Game rules, an abbreviated version of TOPS Time rules for the same positive partner skills (see Appendix D). Day 19 was the last day Walt and Ron were partners in the Center Time activity.

Walt. Walt's positive behavior increased substantially from TOPS Only, 58%, to TOPS+ Short Game, 90%. His negative behavior decreased from 16% to 10%.

Ron. Ron's positive behavior increased from TOPS Only, 57%, to TOPS+ Short Game, 85%. His negative behavior decreased from 14% to 8%. Percentage of behavior not observed decreased, from 29% in TOPS Only to 7% in TOPS+ Short Game.

Table 10 Coach and Player Center Time Behaviors

Phase	Day	N Cards Observed	<u>Walt</u> Role	% +	% -	% 0	<u>Partner</u> Role	% +	% -	% 0	Work It Out
Baseline	4	10	Coach	47	3	50	<u>Ron</u> Player	55	5	40	0
		10	Player	50	0	50	Coach	34	0	66	
	5	10	Coach	40	13	47	<u>Ron</u> Player	50	25	25	0
		10	Player	55	10	35	Coach	36	17	47	
	6	5	Coach	55	12	33	<u>Ron</u> Player	40	30	30	0
		0	Player	--	--	--	Coach	--	--	--	
TOPS Only	12	7	Coach	52	0	48	<u>Dan</u> Player	50	0	50	0
		10	Player	50	0	50	Coach	37	0	63	
	16	4	Coach	67	0	33	<u>Ron</u> Player	63	12	25	0
		5	Player	50	10	40	Coach	60	0	40	
	18	5	Coach	67	13	20	<u>Ron</u> Player	40	30	30	0
		5	Player	50	40	10	Coach	67	13	20	
TOPS + Short Game	19	7	Coach	90	10	0	<u>Ron</u> Player	79	7	14	0
		5	Player	90	10	0	Coach	90	10	0	
	23	7	Coach	100	0	0	<u>Dan</u> Player	100	0	0	0
		10	Player	40	60	0	Coach	63	0	37	
	25	10	Coach	66	17	17	<u>Angie</u> Player	55	15	30	0
		4	Player	75	25	0	Coach	88	12	0	
	26	9	Coach	70	4	26	<u>Dan</u> Player	83	0	17	0
		7	Player	93	7	0	Coach	76	14	14	

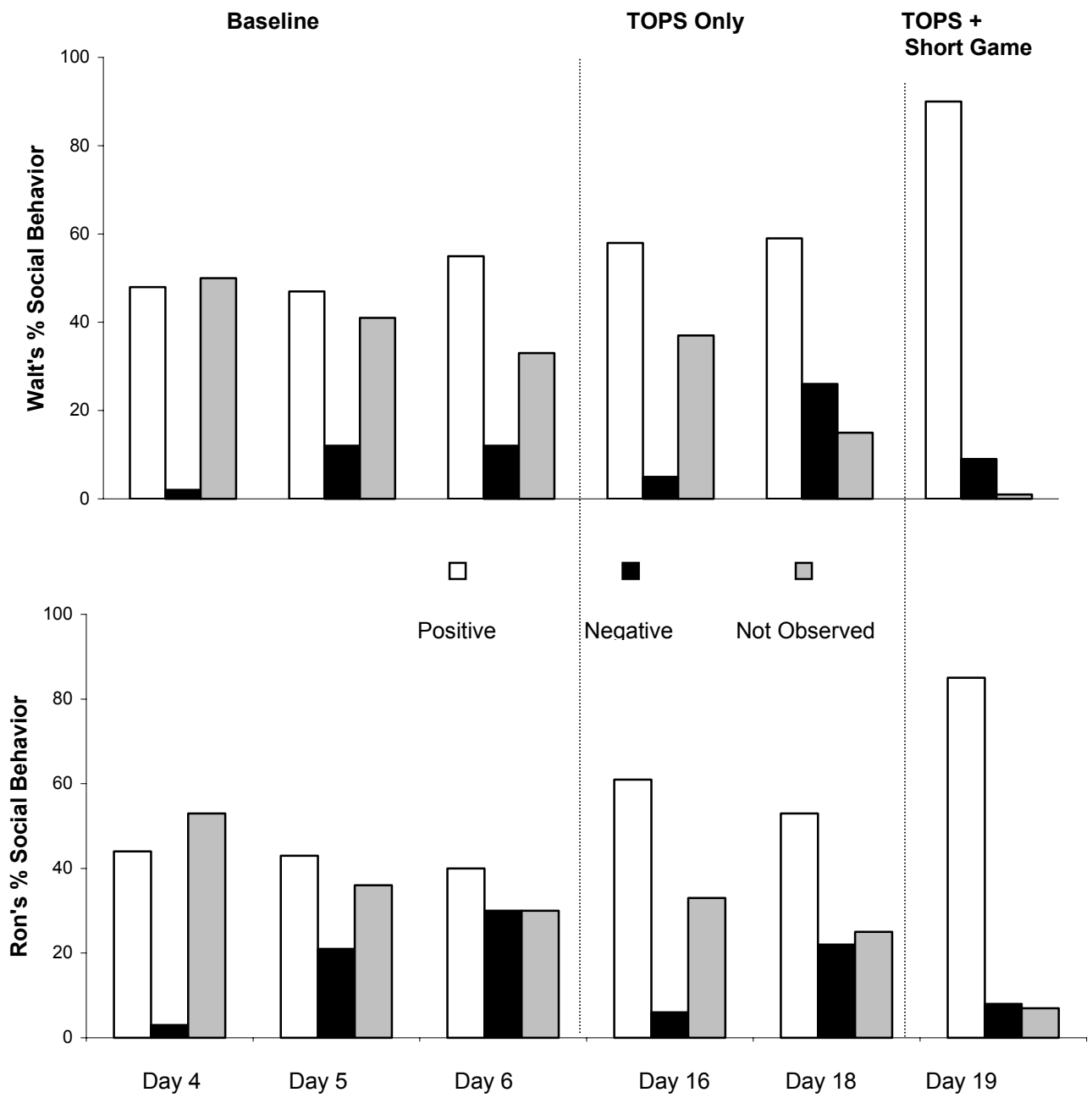


Figure 3. Walt and Ron's Center Time Social Behavior.

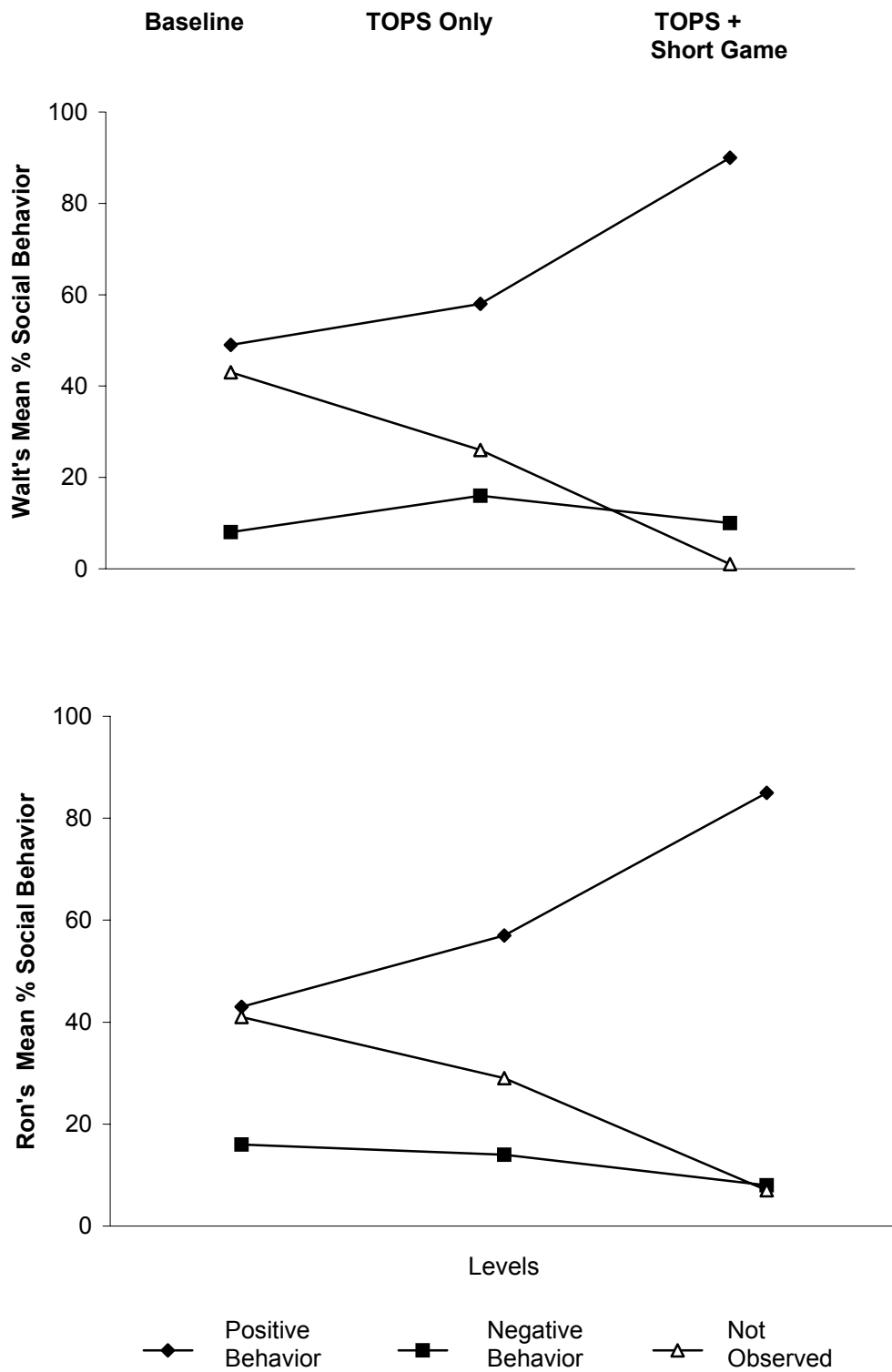


Figure 4. Walt and Ron's Overall Social Behavior Across Levels.

Walt and His Tutoring Partners

Positive and Negative Tutoring Behaviors Across Partners

When Ron was unavailable for Center Time, Walt worked with either Dan or Angie. Figure 5 illustrates variations in Walt's overall positive and negative social behavior (i.e., coach and player) across three tutoring partners and three Center Time levels. Walt and Ron worked together at least one time in each of the three levels (i.e., baseline, TOPS Only, TOPS + Short Game). Walt and Dan worked together at least one time in the last two levels, and Walt and Angie worked together only one time, during the last level.

Walt's positive behavior increased across partners and levels: with Ron, 60% (baseline, TOPS Only, TOPS + Short Game); with Dan, 68% (TOPS Only and TOPS + Short Game); and with Angie, 70% (TOPS + Short Game). Walt's negative behavior exhibited a different pattern: with Ron and Dan, 11% and 12%, respectively; with Angie, 21%. Walt's overall social behavior increased across partners and levels: with Ron, 71%, with Dan, 80%, and with Angie, 91%.

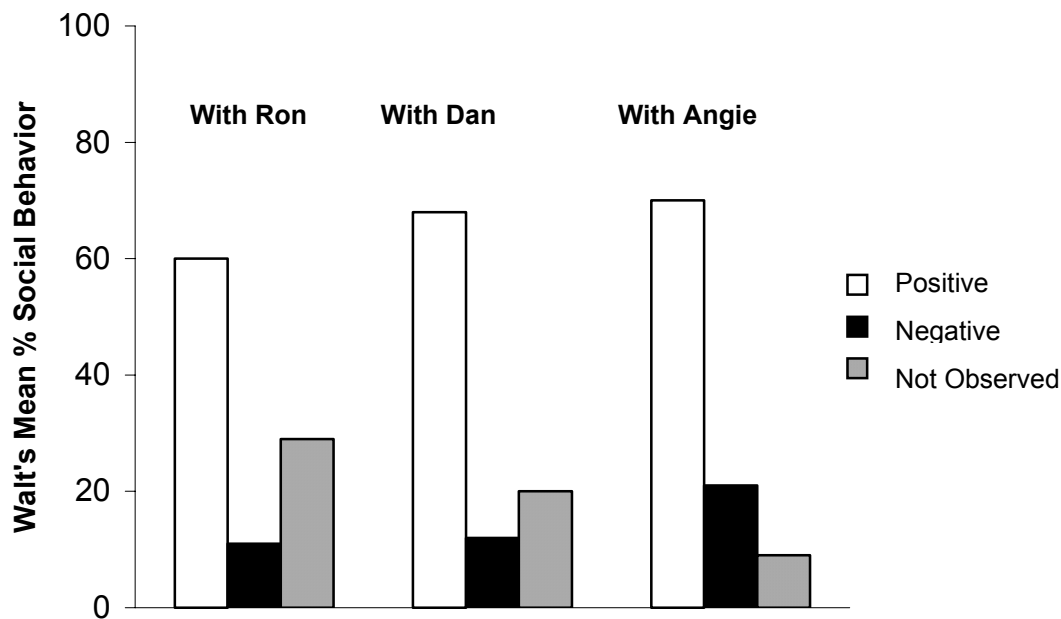


Figure 5. Walt's Positive and Negative Social Behavior Across Tutoring Partners.

Coach Feedback, Player Response, and Redirection

During Center Time, target students were redirected most often during the giving- and- accepting- feedback interaction. Table 11 illustrates the verbal exchange between Coach feedback and Player response for Walt and three partners. When Walt gave good feedback, his partners either accepted it politely or made no comment. Not surprisingly, when Walt made rude or teasing remarks, his partners argued or complained. The students were not redirected unless teasing or arguing escalated to an unacceptable level. There was at least one redirection for 60% of the sessions.

Walt and Ron. Walt and Ron were redirected 5 of 6 days (range, 1 – 6). On Day 18, during TOPS Only level, they were redirected six times. After this session, they received explicit instruction in the TOPS Short Game rules (see Appendix D), adapted from TOPS Time skills (see Appendix C). On Day 19, overall social behavior improved substantially for both students (Walt positive behavior, 58% to 90%; Ron positive behavior, 57% to 85%; see Table 10). Also, Walt's good feedback increased from 20% on Day 18 to 72% on Day 19. Likewise, Ron's positive response increased from 0% on Day 18 to 72% on Day 19.

Walt and Dan. Walt and Dan worked together four days during Center Time. Even though they received no redirection during their tutoring sessions, positive social behaviors increased from Day 12, TOPS Only, to Day 23, TOPS + Short Game, for both boys (Walt, 51% to 70%; Dan, 43% to 82%; see Table 10). Walt's good feedback increased from 0% on Day 12 to 100% on Day 23. No response was recorded for Dan either day.

Walt and Angie. On Day 26, Walt and Angie worked together. Because this was the only time they were partners in Center Time, a comparison between levels could not be made. However, overall positive social behaviors were exhibited by Walt 70% of the time and by Angie 71% of the time (see Table 10). During the session, Walt gave Angie good feedback 40% of the time. On five occasions, he teased her when she responded incorrectly. She responded negatively to three of Walt's negative remarks.

Table 11 Walt's Coach Feedback and Three Players' Response during Center Time

Phase	Day	Partner	% Walt's Coach Feedback			% Player Response			Redirections & Comment
			+ ¹	- ²	0 ³	+ ⁴	- ⁵	0 ⁶	
Baseline	4	Ron	0	10	80	10	10	80	3 – Reminders to give directions & feedback.
	5	Ron	10	40	50	0	50	50	5 – Redirected arguing.
	6	Ron	20	40	40	0	40	60	0 – Walt laughed when Ron missed; called out “you’re wrong!”
TOPS Only	12	Dan	0	0	100	0	0	100	0 – No feedback from Walt; no problems interacting.
	16	Ron	50	0	50	50	25	25	1 – Reminder to give feedback.
	18	Ron	20	40	40	0	40	60	6 – Dyad argued throughout. Didn’t try to work it out. Talked after about using TOPS rules.
TOPS + Short Game	19	Ron	72	28	0	72	14	14	1 – Walt laughed at Ron’s mistakes; improved positive feedback; TOPS Short Game rules.
	23	Dan	100	0	0	0	0	100	0 – Walt gave positive feedback every time; Dan did not respond.
	25	Angie	40	50	10	10	30	60	1 – Walt teased Angie when she missed; she ignored first 2 times, then argued.
	26	Dan	50	10	40	70	0	30	0 – Used Short Game cue card and self-check.

Note. 1 = Good feedback; 2 = Bad feedback; 3 = No feedback; 4 = Accepts politely; 5 = Argues; 6 = No comment.

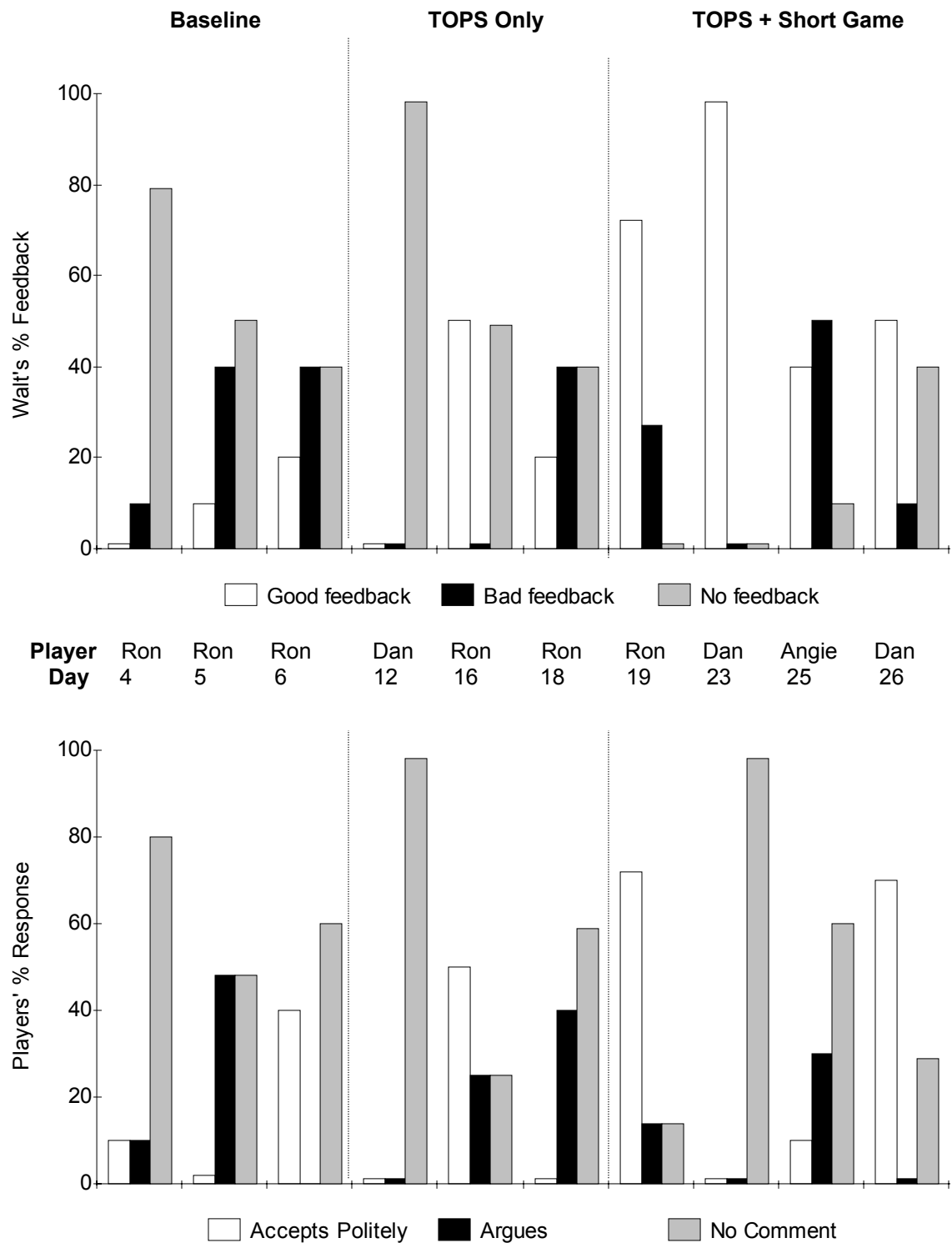


Figure 6. Walt's Feedback and Players' Response during Center Time.

Procedural Fidelity

Training Checks

Training of the multi-component intervention was scheduled for three 30-minute sessions, although a fourth session was necessary to finish the explanation and practice of all the elements. Teaching steps followed the sequential order designed prior to the study (see Appendix E, Training Record & Fidelity Check). After each session, the author and the teacher rated each step as completed, somewhat completed, or not completed (*yes, somewhat, no*). Total agreement between the two raters was 91%.

Day 1 included 11 training items. Nine were completed during the first session (82%). The explanation of coach and player and the distribution of TOPS folders were postponed until the next day. On Day 2, nine scheduled items were completed (100%), as well as the two items held over from the previous day. Training Day 3 was taught across two days. At the end of Day 4, all 11 items were completed.

During training, two items were marked as *somewhat completed*, because it was unclear at the time whether students needed more direct instruction and guided practice to fully understand (a) TOPS rules and (b) teacher point cards. However, as the next section suggests, target students followed rules and procedures well enough throughout the intervention to demonstrate knowledge of these components.

Tutoring Checks

Target students were monitored for procedural fidelity four times during Addition, and twice each during Spell I and Spell II intervention sessions. The overall

mean for accurately following TOPS protocol during eight sessions was 85% (range, 57% to 100%; see Table 12). Students exceeded the 80% criterion level on five occasions (range, 90% to 100%). On three occasions, Day 15, Day 19, and Day 20, they fell below this mark, with fidelity ratings of 70%, 74%, and 57%, respectively. Day 20 was the first day of Walt's transition to his new school. He was unwilling to participate in TOPS when he returned to his old classroom. Despite Walt's refusals, Ron followed coach and player protocol during 81% of the TOPS session.

Target students were prompted or redirected at least one time during seven of the eight intervention sessions (see Table 11). Redirections included reminders to give clear directions (e.g., Days 13, 14, 19) and positive feedback (e.g., Days 18, 19).

Table 12 Procedural Fidelity Across Academic Interventions

Phase	Day	N Cards Observed	<u>Walt</u>	% Follow Procedure	<u>Ron</u>	% Follow Procedure	Mean % Procedural Fidelity	Reminders, Redirections, & Comments
Add	13	4	Coach	98	Player	100	95	1 - Walt -new positive words.
		4	Player	100	Coach	80		4 – Ron remind-give clear direction.
	14	4	Coach	83	Player	100	90	3 – Walt remind-give clear direction.
		4	Player	90	Coach	85		1- Ron remind-read problem.
	15	3	Coach	47	Player	50	70	9 – Friday; silly off task. Ron wrote faster than Walt; argued.
		4	Player	98	Coach	85		0 – no problems Ron coach.
	16	3	Coach	100	Player	100	97	0 - Excellent session.
		3	Player	87	Coach	100		2 – Walt did not answer quickly; Ron remind- to read.
Spell I	18	3	Coach	100	Player	100	100	4 – Walt remind-give positive feedback.
		3	Player	100	Coach	100		2 – Ron remind give positive feedback.
	19	3	Coach	81	Player	88	74	4 – Friday; Walt remind- say each direction.
		4	Player	67	Coach	58		4 – Ron remind-give positive feedback.
Spell II	20	3	Coach	33	Player	81	57	6 – First day of Walt's transition; unsettled; refused to participate.
	24	Short Form	Coach	100	Player	100	100	0 - Last day of TOPS for dyad. Followed all procedures.

Social Validity

Teachers

Post-Training. The teacher and the paraprofessional completed the 14-item Post-Training Acceptability Survey (see Appendix G) after students received TOPS training. They rated each statement about the potential value and practicality of the intervention for their classroom on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). They shared the same opinion on only two items. Both marked 2 (*disagree*) for “TOPS is easy enough for most of my student to learn without teacher guidance,” and both marked 3 (*neutral*) for “TOPS skills of sharing and giving positive feedback will be practiced by my students in other less structured settings.”

The teacher either agreed (3 items) or strongly agreed (6 items) with statements expressing practicality (e.g., “TOPS will fit into our daily schedule”), compatibility (e.g., “TOPS rules are compatible with our classroom behavior management system”), and potential value (e.g., “TOPS will help my students improve their academic skills”). She marked 3 (*neutral*) for four statements, including “TOPS will help my students learn important test-taking strategies.”

The paraprofessional had a much less positive view of the intervention. She either disagreed (7 items) or was neutral (7 items) concerning each statement.

Post-Intervention. During week 8, the teacher and the paraprofessional completed the Post-Intervention Survey (see Appendix G). They again rated 14 statements about TOPS using the same scale, 1-5. They shared the same opinion on seven items, both marking 4s or 5s (*agree* or *strongly agree*) for statements including: “TOPS fit into our daily classroom schedule,” “TOPS helped my students

improve skills in math, spelling, and US states,” and “TOPS is compatible enough with our academic and social program to continue after this project ends.” They both strongly disagreed with one of the negatively- worded statements, “TOPS procedure was too long for most of my students to stay engaged the entire session.”

The adults were asked to write comments on the back of the form about matters not addressed in the survey. The teacher wrote examples of target students interacting more appropriately with peers during unstructured times (e.g., lunch, YMCA). The paraprofessional described the drill and practice feature of TOPS as helpful with retention of academic skills.

Students

Post-Training. After they participated in TOPS training, target students, Walt and Ron, and their classmate, Dan, completed the 6-item Student Survey by marking each statement with *yes*, *some*, or *no* (see Appendix G). The three boys agreed that TOPS rules were easy to follow, although only Ron and Dan marked a definitive *yes* for “I know about how to play the TOPS game,” and “I can do all the steps of TOPS with my partner.” Walt marked *some of it* for both of these statements.

Walt and Dan agreed that they liked “sharing the points I earn with my partner,” although Ron was less certain, marking *some of the time* for this statement. Ron and Dan thought TOPS would help them learn academic and social skills and Walt thought the intervention would help *some of the time*.

Post-Intervention. Walt, Dan, and Angie completed the post-intervention survey during an afternoon session in Week 8 (see Appendix G). Ron completed the

survey during a follow-up session in Week 10. All students agreed that they had learned how to play TOPS, the rules were easy, they liked sharing points, and TOPS helped them learn math, spelling, and US states. They also agreed that TOPS helped them “get along with my classmates better” and “other classrooms should use TOPS to practice positive partner skills.”

Students were also asked to complete two open-ended statements. Responses to “One thing I did NOT like” included: “math test” (Walt); “doing it early in the morning” (Dan); and “when you did not come on Monday” (Angie). Ron left this statement blank, verbally stating he liked everything about TOPS. Responses to “My favorite part of TOPS” included: “store”(Walt); “coach practice” (Ron); “the store and the snack” (Angie); and “writing down the problem” (Dan). Dan verbally explained he liked writing each word or math problem on the coach and player cards.

CHAPTER 5 – DISCUSSION

There were three main goals of the present study: (a) to develop and implement an intervention that targeted academic and peer interaction deficits of elementary students with EBD; (b) to investigate whether its use was functionally related to academic scores of a student dyad; and (c) to investigate whether positive behaviors taught and practiced during academic sessions would generalize to a different setting. Questions concerning the efficacy of the intervention were also addressed. These included students' performance, acceptability, and usefulness of the intervention to bring about meaningful changes in academic and social behavior.

The rationale for designing TOPS was predicated on the premise that young students with EBD lack sufficient skills in academics and peer relationships and need instruction and practice in both. Some researchers (e.g., Sugai & Lewis, 1996) have suggested that acquisition of social skills is a prerequisite for academic skills. Hewett's Madison School Plan (1974) and Wood's Developmental Therapy (1975; 2001) illustrate behavioral and psychoeducational perspectives of this approach. Others (e.g., Ayllon & Roberts, 1974) have suggested that treating academic deficits primarily may also decrease problematic behaviors. The present intervention was designed to expedite the process of improving social skills and academics by explicitly teaching both simultaneously rather than targeting one or the other.

The present study was intended to extend existing RPT research. Most published studies using CWPT or PALS with students with EBD focused either on academics (e.g., Bell et al., 1990; Falk & Wehby, 2001) or behavior (Locke & Fuchs,

1995), but not both. An exception was the Wehby and colleagues (2003) investigation of the effects of a reading program and PALS on reading acquisition and inappropriate behavior. Their research was particularly applicable to the present study because of similarities in experimental design, dependent variables, student characteristics, and outcomes. Some of the same problems described by Wehby and colleagues were encountered in this study, including day-to-day variations in academic and social performance, divergent skill levels and conflicting baseline trends of students within dyads, and modest treatment effects.

Results of TOPS Time academic behavior and procedural fidelity and Center Time social behavior are discussed below. Next, limitations of both academic and social behavior investigations are presented. Finally, lessons learned from the development and implementation of TOPS and implications for future research and practice are discussed.

TOPS TIME – Academic Behavior

Very few data points were used in the multiple probe across academic behaviors study. Visual inspection of these data for two students across four behaviors and analysis of trends, mean scores, and level changes tentatively suggest a connection between TOPS and academic scores for both students. Flaws in the study, discussed in the limitations section below, compromise definitive conclusions about the overall experimental effect of TOPS; however, single replications of the AB design for each student (Ron, Addition and Spell I; Walt, Spell I and Spell II) indicate a potential relationship between intervention and academic gains.

Ron's scores increased sequentially across Addition, Spell I, and Spell II only after TOPS was introduced to each behavior individually. His baseline Addition probes showed a descending trend. The last day of baseline he scored 9 correct; whereas, the first day of TOPS Addition, he scored 19 correct. On the same day, Day 12, baseline scores for Spell I (0 correct) and Spell II (0 correct) remained stable. On Day 17, the first day of TOPS Spell I, Ron's Spell I score was 8 correct and his baseline Spell II score was 1 correct. Data for TOPS Spell II are inconclusive because Ron only participated in two Spell II probes, although both scores were substantially higher than baseline levels (9 correct and 7 correct).

Addition scores for Walt did not show the same level of improvement from baseline to intervention. Instead, his addition scores indicated a very gradual ascending trend, which may have been related to reactivity to the 1-minute probe. During initial baseline days, Walt was observed working a few problems and then putting his pencil down before the timer rang. As the study progressed, he was observed working problems, pencil-to-paper, for the entire probe session. Thus the increase in addition scores may have been a function of his increasing familiarity and adeptness with the 1-minute testing format rather than an effect of TOPS.

Walt's probe scores for Spell I and Spell II may be a better indication of a possible relationship between independent and dependent variables. Baseline scores for both were stable and each showed an ascending trend only after Walt received TOPS training in the respective behaviors. For example, on Day 17, the first day of TOPS Spell I, Walt's Spell I score was 5 correct and his baseline Spell II score was 2 correct. Spell I scores increased across 3 days, the minimum number

required to establish a trend. Spell II intervention lasted 4 days and, again, his scores showed an ascending trend.

The intervention phase of the fourth dependent variable, Subtraction, was not implemented because Walt was not available for TOPS Time morning sessions by Day 27 of the study, and Ron was unable or unwilling to work with another partner. A replication of the fourth variable would have strengthened the argument for experimental control of TOPS for both boys. However, lack of substantial change in either students' subtraction scores across four weeks of intervention targeting the other three dependent variables provides some measure of corroboration that change in scores was produced by TOPS and only TOPS.

Limitations concerning student pairing and attrition are discussed below. It was clear that this problem affected academic practice and testing for both boys and weakened the experimental design of this study, as more data points would have been desirable. That gains in addition and spelling scores were evidenced after only a few TOPS sessions may be a potential strength of the intervention. The short duration of each phase offers some promise of steady growth with consistent and longer treatment phases.

Procedural Fidelity

Another encouraging outcome of the academic study was the demonstration of procedural fidelity by target students. In order to make judgments about the effectiveness of TOPS, it was essential that the boys implemented the treatment as it was designed, therefore an 80% criterion was established at the beginning of the study, and eight sessions across three academic behaviors and four weeks of

intervention were monitored. Overall procedural fidelity for both boys was 85%. During five of eight sessions, procedural fidelity was 90% or higher.

Variations in attention, behavior, and procedural fidelity during TOPS Time morning sessions may have contributed to variations in academic probe scores during afternoon sessions. For example, on Day 13, the second day of TOPS Addition, overall procedural fidelity was 95% and mean addition score was 14.5, or 2.5 points higher than the day before. On Day 15, however, overall procedural fidelity dropped to 70% and addition mean score decreased to 11. On Day 16, overall procedural fidelity was 97% and addition mean score increased to 16.5. Anecdotal reports of Day 15 indicated both boys were off-task and argumentative during the morning TOPS session, while on Day 16 no behavioral problems were reported.

It is tempting to assume that there could be a relationship between day-to-day variability in social behavior, procedural fidelity, and academic scores as reported in the present study and in Wehby et al. (2003). More research over a longer period of time is needed to demonstrate a connection between high or low intervention fidelity and increasing or decreasing scores.

Center Time – Generalization of Social Behavior

A concurrent investigation took place during afternoon Center Time sessions to examine the effectiveness of the generalization component of TOPS. Three levels of generalization training were compared by observing tutoring behavior during Center Time to determine if positive skills taught and reinforced during TOPS Time would also be observed in the second setting. An experimental design was not used

to evaluate changes in tutoring behavior across training conditions; therefore, the following discussion of the relationship between generalization procedure and change in social behavior in Center Time, outside the TOPS training setting, is speculative.

The plan for generalization included a stepwise presentation, from *none* to *all*, of elements intended to encourage the same type of positive tutoring behavior reinforced in morning TOPS Time sessions. Common physical and social stimuli (e.g., flash cards, cue cards, peer tutors) were programmed on a continuum in order to investigate the amount of training necessary for positive behaviors to generalize to afternoon Center Time sessions. If generalization was observed, one or more of these elements may have acted as a functional mediator to occasion the desired behavior in the second setting.

In order to observe the tutoring pair during Center Time, I sat across from them at a large round table. My presence in the testing area restricted the ability to attribute outcomes to a specific generalization feature. If positive tutoring behavior generalized, it would be difficult to discern which mediator, including my presence at the table, was responsible. Results of baseline and TOPS Only social behavior indicated that my presence did not occasion positive interactions, and in fact, my lack of redirection during Center Time, unlike my active intervening during TOPS Time, may have acted as a discriminative stimulus for negative behavior. In other words, “no redirection” may have signaled tacit permission for misbehavior and negative social interactions. Of course it would have been preferable to observe and

record tutoring behavior in the second setting without my presence confounding the results.

Despite this constraint, there seemed to be an association between the pattern of tutoring behavior exhibited by Walt and Ron and level of generalization training. Both boys exhibited more positive behavior and fewer incidents of *no response* as more overt training was introduced. Their overall negative behavior, however, remained about the same across three levels of generalization. This may indicate that while students learned to give more directions and follow them more consistently, they needed further direct instruction and reinforcement to substantially reduce negative social interactions, particularly during the coach feedback - player response exchange.

Even though there was a gradual increase in positive behavior, anecdotal notes suggested that Walt and Ron did not make a connection between behavioral expectations of morning and afternoon tutoring sessions until it was explicitly stated that they were playing the same game in both settings. Afterwards, the boys seemed to be more amenable to using the same rules in the afternoon that were highly reinforced in the morning.

A social interaction that warranted further consideration in both settings was the *how to work it out* procedure. Students did not try to resolve disagreements during tutoring sessions, even though *how to work it out* had been taught and practiced during training days. The cue card listing steps for this intervention was clearly visible during morning TOPS Time sessions and during afternoon sessions in TOPS Only and TOPS + Short Game. The students did not use the card to prompt a

solution to conflicts in either setting. This skills deficit leads to implications for further training.

Walt interacted with three peers during Center Time sessions with minor variations in patterns of social behavior across partners. There were interesting differences in level and type of behavior according to the gender of his partner. Positive and negative interactions were fairly consistent with Ron and Dan. With Angie, however, he exhibited slightly more positive behavior and more negative behavior. In other words, he interacted with her more (fewer incidents of *not observed*) than with either of the boys. Also, with Angie, Walt's negative interactions were characterized as silly and teasing, while his negative interactions with Ron were characterized as taunting and argumentative.

After Dan and Walt's transitions were completed, Ron and Angie were to be partners during TOPS Time and Center Time. Unfortunately the flexibility to work with different students exhibited by Walt was not evidenced by either Ron or Angie. Both students seemed to experience a decline in appropriate behavior after the transitions of their original partners. Daily attempts to pair Ron and Angie during the last two weeks of the study were complicated by repeated absences, early morning timeouts, and ultimately, a physical fight precipitated by Angie stealing an object from Ron's desk. Finding alternative partners for either student was especially difficult because of the small class size and diverse levels of cognitive ability of the remaining students.

Social Validity

Adaptability

A prerequisite for the present study was that TOPS be used for all students in the classroom. Its design, like CWPT and PALS, included whole group activities and contingencies as part of the social and academic skill building intervention package. However, unlike CWPT and PALS implemented in general education classrooms, there was little flexibility in student matching in the separate setting. Initially, three dyads were formed according to ability, academics, and compatibility of the six students in the class, and academic material was adapted for the skill level of each dyad. However, the small class size was problematic when students were absent or unavailable for TOPS. As mentioned above, finding a suitable replacement partner for Ron proved difficult after Walt's transition.

This situation exemplifies the conundrum of implementing RPT in a separate setting. The intervention seems well suited to treat academic and social skills deficits because it incorporates empirically based features that address both problems. In order for students to benefit from the strategy, however, they must be matched for academic level *and* social compatibility. Suggestions for addressing the matching criteria are discussed below.

Acceptability

On a more positive note, consumers of TOPS, teachers and students, were generally pleased with the usability, practicality, and value of the intervention to improve academics and peer relationship skills. Students were positive about their ability to perform procedural aspects of TOPS, their willingness to participate with a

peer, and their perception of gains in academics and social skills. They reported liking the token system, sharing points, and working on academic skills.

The classroom teacher endorsed the use of TOPS for improving academics and behavior. She agreed that the intervention was compatible enough with academic instruction, classroom management system, and daily schedule to continue implementation after the study ended. She organized folders with TOPS forms and flash cards of different levels for student dyads to use as center activities in preparation for withdrawal of day-to-day researcher involvement. Although we planned for this transition, TOPS was not used during a two-week period following the last intervention day, perhaps because of the student matching problem described above.

Overall Usefulness

A primary goal in developing TOPS was to create an intervention that teachers and their elementary students with EBD found quick, easy, and enjoyable to use. Procedural prompts, student cards, self-assessment, and scoring forms were designed so that elementary students could participate in all aspects of the strategy with minimal teacher assistance. In the present study, students with MD and autism required teacher assistance in following tutoring procedure and scoring, but the remaining students implemented the academic strategy efficiently, within the 20-minute timeframe, and effectively, with at least 85% procedural fidelity.

One way to judge the value of the intervention is to compare teacher and student time and effort in implementing the intervention with overall improvement in academic skills. In the present study, addition and spelling scores increased from

baseline to intervention. A criterion for success was not established beforehand, however, because scores were so low during baseline, any increase would be noteworthy. For example, during Addition baseline, Walt scored an average of 2.6 problems correct in 1 minute. His mean score during intervention and maintenance was 7.5 correct, substantially higher, but still well below expectations for a 4th grade student.

It seems reasonable to assume that in order to cause changes great enough for these students to begin to close the educational gap with and approach academic levels of their age mates, longer and more intensive treatment programs will be necessary. Wehby and colleagues (2003) also reached this conclusion after reporting modest gains for young students with EBD who received direct instruction in phonological awareness skills 45 minutes a day, 4 times a week and accompanying PALS practice 30 minutes a day, 4 times a week.

Limitations of the Study

Several limitations in the design and implementation of the study may have impacted outcomes of the investigation. Interpretation of results was constrained by a confluence of problems during the course of the study. Some methodological concerns were expected and a priori rules were established accordingly; others were not sufficiently anticipated and were addressed in situ. Major limitations included:

1. Lack of direct instruction in math and spelling before implementing TOPS.
2. Divergent Addition baseline levels and trends for student dyad.
3. Attrition precipitated by either day-to-day behavior problems or overall improvement in behavior, resulting in;

4. Lack of sufficient data points across academic variables.
5. Insufficient training of specific social behaviors.

Lack of Direct Instruction in Math and Spelling

Like CWPT and PALS, TOPS was designed as a supplemental program to offer more opportunities to practice academic skills taught during teacher-led instruction. (See Falk & Wehby, 2001 for an example of direct instruction of phonological skills prior to PALS.) During the present study, however, students did not receive explicit instruction in math or spelling strategies during in-class time before the implementation of TOPS. Probe scores may have increased at a different rate and reached a different level had TOPS been used as a supplementary program as originally designed.

Also, because typical classroom academics did not include group lessons, informal peer mediation, or center activities, baseline measures of social behavior between dyads were established during the researcher-developed center activity. Different levels of positive and negative behavior may have been observed had I not been seated at the table with the target students.

Baseline Levels and Trends

Addition baseline levels and trends differed for Walt and Ron. The variation in baseline scores was anticipated (see Falk & Wehby, 2001, and Wehby et al., 2003 for examples of divergent levels of reading scores of students within one dyad), even though the dyad was well matched according to present level of academic performance. Ron's baseline mean score was 10 points higher than Walt's in Addition, although Spell I and Spell II baseline scores were essentially the same.

Addition baseline trends were also different for the two boys (see Wehby et al., 2003 for examples of discrepant baseline trends between students within a dyad), although no trend was apparent for either student in the other three academic behaviors.

In anticipation of divergent levels and trends for students in the same dyad, several guidelines for determining appropriateness of flash card material and readiness for phase change were pre-established. One, the 50% cutoff rule (three consecutive baseline mean scores at or below 50%), was similar to the criterion method for selecting appropriate content for CWPT (Greenwood et al., 1997). This approach had limited usefulness in determining phase change because it indicated academic level only and not trend or predictability of continuing scores.

Therefore, in order to decide when to begin the first intervention, Addition baseline data were analyzed (a) as mean scores for both boys and (b) as individual scores for each boy separately. The latter comparison required scores in baseline and subsequent phases to be presented independently rather than as aggregated data points.

The mean of Ron and Walt's baseline scores showed a descending trend. Four of five mean scores fell below the 50% cutoff, suggesting appropriateness of material and readiness for phase change. Further, Ron's addition baseline scores across five days also showed a descending trend.

A quarter intersect calculation was needed to determine the trend of Walt's baseline addition scores. This calculation showed an ascending trend. This leg of Walt's data should be disregarded for further consideration of experimental control

because intervention began despite the ascending trend. Baseline probes should have continued until either (a) a flat trend or (b) a descending trend was evident.

The decision to implement the first intervention was made based on visual inspection of data points for all dependent variables and practical and ethical concerns. They included (a) the eagerness of all six students and both adults for the “game” to begin, especially the opportunity to earn tangible prizes, (b) unexpected and extended days spent during training, and (c) Ron’s limited participation in afternoon sessions because of behavior problems. Walt’s transition plan was not known until two weeks later, so it was not instrumental in this decision.

Multiple Probe Design and Limited Data Points

A disadvantage of multiple probe design across behaviors was the extended time required to execute enough replications to establish experimental control. With this potential problem in mind, it was decided a priori that the first intervention would end and the second intervention would begin immediately after a trend was established for the first dependent variable. This procedure was also followed for the second and third dependent variables. Thus, a minimum number of data points for Walt (5 for Addition, 3 for Spell I, and 4 for Spell II) and Ron (5 for Addition, 3 for Spell I) were used to establish ascending trends in each intervention phase. Unfortunately, Ron only participated in 2 Spell II probes; therefore that replication was not acceptable for consideration of experimental control.

Original applications of multiple probe. Horner and Baer (1978) described two types of application for multiple probe design. The first was used for the acquisition of a behavior taught in sequence, for example, a 10-step procedure for learning to

use crutches. All behaviors in the sequence were probed on Day 1. Subsequently, consecutive “true baseline” measures (p. 192) were given only after the preceding step in the sequence had been acquired. In other words, there was no logical reason to test baseline measures for Step 6 until Steps 1 – 5 had been learned. This application of consecutive baseline measures immediately before intervention did not apply to the present study because its academic behaviors were not sequential.

Baseline probes in the present study were employed according to the second application described by Horner and Baer (1978). In this case, intermittent rather than consecutive probes were recommended as alternatives to extended baselines if such measures were thought to be reactive or impractical and an assumption of stability could be made. In order to assume stability of Baselines 2 and 3, I followed the procedure for multiple baseline suggested by Schloss and Smith (1998): Three consecutive Spell I and Spell II probes were given on Days 1 – 3. Stability of both spelling probe scores for both boys was established before Addition intervention began. Also, to assure no change in baseline levels of untreated behaviors, probes were given on the first day of successive interventions.

Comparison with multiple probe design example. In an example of multiple probe (Heller, Allgood, Ware, Arnold, & Castelle, 1996) provided by Alberto and Troutman (2003, p. 202) “true baseline” was used to establish zero incidents of behavior before intervention began for each of 4 students. It provided clear evidence of experimental control with minimal data points in each intervention phase (Leg 1, 4 data points; Legs 2 – 4, 3 data points in) across 4 students.

A weakness in the execution of multiple probe design in the present study was lack of three consecutive baseline probes immediately after an ascending trend was established in the preceding behavior and immediately prior to beginning each of the spelling interventions. The a priori rule to begin treatment immediately after a trend had been established for the first behavior was not consistent with the requirements of this design. According to the plan established beforehand, baseline spelling probes were given on the first three days of the study. Thereafter, one additional baseline probe was given before Spell I intervention, and two additional baseline probes were given before Spelling II intervention. This flaw in execution compromises the assumption of stability for both spelling variables. Although both boys' spelling scores were stable on Days 1 – 3, and remained low on Day 12 and Day 17, it cannot be assumed these scores were an accurate prediction of continued performance without intervention. Ideally, Spell I baseline probes should have been given on Days 17-19, after the ascending trend in Addition had been established. If these spelling scores were sufficiently stable, then intervention should have begun on Day 20. The same pattern should have been followed for Spell II.

The present study used minimal data points in intervention phases to establish ascending trends. Insufficient data were collected for both students across four behaviors, despite anticipating some of the problems. Only two viable demonstrations of AB design were established for each student, Walt – Spell I and Spell II, and Ron – Addition and Spell I. Tentative conclusions about the potential of TOPS to affect academic scores are based on these replications.

Insufficient Social Skills Training

Although students followed protocol with adequate accuracy in tightly scripted TOPS academic sessions, they did not receive sufficient training to resolve arguments in less structured Center Time sessions. More direct instruction, examples, and practice should have been incorporated in training days and during TOPS Time tutoring sessions in order for students to learn to use the *how to work it out* strategy.

Implications for Future Research and Practice

Results and limitations of the present study suggest considerations for future research and practice in three areas: (a) development and implementation of TOPS, (b) treatment of academic behaviors, and (c) generalization of positive social behaviors. Revisions and further study should be guided by lessons learned including:

1. Teachers were not readily willing to participate in the study.
2. Elementary students with EBD implemented TOPS with adequate procedural fidelity after initial fairly rigorous training.
3. Confounding variables in the academic study included:
 - a. Variations in students' prior knowledge and skill acquisition,
 - b. Timed math tests,
 - c. Day-to-day changes in social behavior, and
 - d. Attrition.
4. Positive tutoring behaviors did not generalize in a second setting until after explicit instruction.

Collaboration with Teachers

The first problem I encountered during the initial phase of the present study was finding a teacher to agree to participate. Although six teachers were approached, and four attended an introductory session, only one volunteered. No reasons were given for nonparticipation, although it was speculated that teachers may have resisted (a) an unknown program and an unknown researcher intruding in daily classroom routine; (b) commitment to twice-a-day activities over at least a two month period; and (c) a strategy that required peer interaction, which could potentially lead to additional behavioral problems within the classroom. Also, teachers may have perceived TOPS to be too time-consuming or too complex, or they may have been opposed to some of its features such as class meetings or the use of tangible reinforcers.

In the future, measures should be taken to emphasize the potential advantages and importance of participating in a project that may concurrently increase students' academic and social skills. Teachers should be assured that they would receive adequate training and support as collaborators during all stages of the intervention, including the post-experimental phase. Researchers could offer additional incentives by creating tutoring materials from classroom curricula, tracking students' scores, checking for procedural fidelity and remediating when necessary, and troubleshooting logistical and other problems. Baker, Gersten, Dimino, and Griffiths (2004) found some of these variables were instrumental in the sustained use of PALS by a group of elementary teachers over a five-year period.

Student Implementation

Although some elements of TOPS were planned to be teacher-led (e.g., token reinforcement system, group meetings), others, including academic practice, feedback, and self-assessment, were designed to be implemented by students. After initial training, elementary students in the present study accurately demonstrated their ability to practice peer-tutoring interactions. The criterion for acceptable procedural fidelity was set at 85%, although careful comparison of procedural fidelity and academic scores may lead to a more appropriate cutoff level. In the future, teachers may monitor students frequently during an initial training period to assure acquisition of tutoring procedure. Afterwards, intermittent monitoring and retraining specific procedural errors may be sufficient for continued fidelity.

Academic Behaviors

The results and limitations of the academic investigation led to several suggestions for future research and practice, including the following.

Investigate the effect of TOPS on only one academic subject at a time over an extended period. Although math and spelling probes were chosen to be comparable, no method of determining this was established. One obvious difference between the two was test-taking procedure. Improvement in math scores may have been confounded by the timed test rather than lack of strength of the intervention. Students should be taught to tolerate timed tests by repeated practice and reinforcement before they are used to measure the power of an intervention.

Use alternatives to multiple probe across behaviors design. For example, a multiple baseline across classrooms using three or more classrooms and one

academic behavior such as spelling, could explore the relationship between TOPS and spelling scores for three or more sets of students. A changing condition design could compare the effect of TOPS with another supplemental program, such as CWPT or PALS. Also, this design could investigate salient features of TOPS (or other RPT strategies), such as use of flash cards only with no token reinforcement compared with use of flash cards and token reinforcement.

Design and execute future studies to better control for expected day-to-day changes in social behavior and attrition. More participants and more opportunities to engage in the intervention may remedy both of the above problems. Daily probes over a longer intervention period (months, not weeks) may better capture average growth, given frequent variability of behavior and participation. However, weekly probes may fit more naturally with typical classroom instruction and testing, and be less aversive and more socially acceptable to students and teachers (see Falk & Wehby, 2001; Wehby et al., 2003).

Social Behaviors

Initial investigation of social behaviors tentatively suggests that positive tutoring interactions introduced in one setting can be transferred to another if generalization skills are explicitly taught and reinforced. Extra instruction, guided practice, and reinforcement may be necessary for social interactions that are unfamiliar or particularly resistant to change. In the present study, *how to work it out* and the coach feedback – player response exchange were examples of social behaviors that should have been targeted for more direct instruction.

Social compatibility of peer tutors was a major consideration in the original matching process used in the present study. Although it was important for initial instruction and practice, training for generalization across peers may be essential to the effectiveness of the academic portion of TOPS, especially in separate classrooms with few students. Classmates should practice positive partner skills with a variety of peers, including those of the opposite sex. When students are paired for compatibility practice rather than academic deficits, flash card topics should be age-appropriate and applicable to all students in the class. Alternatively, a non-academic but appealing skill, such as matching football teams with mascots or hometowns, could be used.

Social Validity of Research Study

The social validity of researcher time and effort compared to the very small experimental effect should be questioned. Other ways to address the problems of academic and social deficits should be considered for future studies. Rather than design and implement a new intervention, time might be better spent replicating well-established treatments for academic and social problems. Perhaps student scores would improve more rapidly and more dramatically if methods of teacher-led direct instruction of math and spelling are used. Likewise, social skills might improve more with direct instruction in specific relationship skills, rather than with peer tutoring programs. The limited success of this study and other studies using RPT with elementary students with EBD may indicate that it is not the most expeditious method of treating academic and social problems. Researchers may find other more effective ways to produce an effect comparable to the time and energy expended.

Conclusion

The purpose of this study was to develop and implement an intervention that effectively and simultaneously improved co-occurring characteristics of academic and social problems of elementary students with EBD. The intervention was based on CWPT (Greenwood et al., 1997) and best-practice comprehensive programming for young students with EBD. Substantial modifications to CWPT were made in order to accommodate the behavioral challenges as well as learning problems of students with EBD. These modifications included simplification of the procedure, increasing reinforcement, teaching specific skills necessary for effective peer tutoring, and planning for generalization of these skills in other settings.

Although conclusions about the strength of TOPS to affect academics and social interactions are equivocal at this point, certain aspects of the study seem promising. The intervention was accepted and eventually praised by the teacher and her students. On most days, it was implemented with fairly high levels of procedural integrity. Despite constraints, a limited number of academic scores for two students increased over the course of the study. Preliminary investigation of the plan for generalization produced potentially helpful results for future experimental exploration.

Further development and implementation of TOPS may be guided by a model designed and used by the Fuchs (1998) to integrate new educational programs into classroom settings. They suggested a three-stage research-to-practice process: (a) pilot research, (b) formal evaluation, and (c) scaling up. The present study replicated initial features of Stage 1, pilot research, which they described as: "Identifying an

important problem, piggybacking on existing research to develop a prototype that addresses the problem, and testing and revising it with a small group of teachers and their students” (p.129). According to this model, the next step in the development of TOPS should be to refine procedural and methodological features, then implement it again with another set of teachers and their students.

The goal of this initial study was to design and execute an intervention that targeted academic and social interaction deficits. The overall value of TOPS will depend on its ability to consistently and substantially improve both of these pervasive problems of elementary students with EBD.

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APPENDICES

APPENDIX A

INFORMATION PACKET FOR PROSPECTIVE TEACHERS

August 4, 2003

Dear Teachers,

I would like to invite you to participate in a pilot study for an intervention designed to help students with emotional and behavioral disorders (EBD) improve academic and social skills. *Teaching Ourselves Positive Skills* (TOPS) is based on the well-researched and very successful program, ClassWide Peer Tutoring (CWPT) developed over 20 years ago at the University of Kansas. TOPS uses the basic CWPT concept, but makes changes to address specific social skills deficits of students with EBD.

This package intervention employs tried-and-true techniques, including direct instruction, positive reinforcement, and self-management strategies. Additionally, it integrates a generalization feature. Students are given the opportunity to practice reciprocal tutoring in a peer-directed center activity. Please read the enclosed handout to find out more about CWPT and TOPS.

I am very hopeful that TOPS will be shown to be a fun, easy, and effective strategy for students and teachers. Its components are based on empirical research and my own experiences teaching students with EBD for 8 years. Over the summer, I revised the original iteration of TOPS after receiving insightful feedback from professors and teachers in North Carolina and Massachusetts.

It is now time to go from research to practice and give it a try with real students and teachers.

I would like to implement TOPS in your classroom this fall as part of the pilot program to investigate if what we think is a really good strategy actually works to improve academic scores and interpersonal relationships. Here is some preliminary information about how this study will work:

- It will be a multiple-baseline-across-students design. We will introduce TOPS sequentially to student-pairs in order to see if there is a relationship between academic scores and social interactions and the intervention.
- We have chosen math computation as the target academic skill and self-correcting flash cards as the medium of instruction. In the peer-tutoring sessions, your students will practice basic facts (e.g., addition, subtraction, multiplication), depending on their age and stage.
- Each TOPS' session will last no longer than 30 minutes: Peer-tutoring for 15-20 minutes; and group meeting (self-assessment, scoring, reporting, positive statements) for 10 minutes. TOPS will be implemented 3 times a week.
- A 10-minute center activity will parallel the TOPS' intervention.

I will be visiting your school to offer more information about TOPS and answer questions about the project. Thank you in advance for your time and interest. I hope you can use the do-dads included in this packet. If you received one of the items listed below, be sure to see me for a special TOPS' gift:

Purple Moon Eraser

Yellow Sun Stamp

Green Moon Stamp

Sincerely,

Chan Evans, M.Ed.
Assistant Professor

Enclosures

Teacher Questionnaire

Thank you for answering a few questions about your classroom and previous experience with peer tutoring. Your responses will help us implement TOPS in classrooms and provide the greatest amount of academic and social benefit with the least amount of disruption to students and their daily school routines.

Before completing this page, please read the brief description of TOPS included in this packet. Thanks in advance for taking the time to consider participating in this project and returning this questionnaire to me in the stamped self-addressed envelope.

1. Are at least 2 students in your classroom working below grade level in math computation? Y N
How many students are working...

at grade level? _____ at least 1 year below? _____ at least 2 years below? _____

2. Do at least 2 students in your classroom also need more help with interpersonal and reciprocal relationships with peers? Y N

3. From what you know about this project so far would you prefer it as ...

_____ a whole-class intervention.

_____ 1 or 2 student-pairs receive intervention as a pull-out in another setting.

_____ all students participate in TOPS, but introduce it to pairs sequentially.

4. Did you use any type of academic peer tutoring last year? Y N

If Yes: Did you consider this strategy helpful? Y N

For which subjects? _____ How often? _____

5. How long are your educational blocks? _____

- 6A. Do you teach math everyday? Y N

B. At what time? _____

- C. Do you assign a math independent practice time everyday? Y N

- D. Do your students use flash cards to help learn basic math facts? Y N

- E. Do you assign math homework? How often? _____ Y N

- 7A. Do you use math center activities? Y N

- 7B. Do you have a specific center time? When? _____ Y N

- 8A. Do you use a token reinforcement system? Y N

- 8B. Do you use a level system? Y N

9. Do you teach daily social skills lessons? Y N

10. Do you use daily class meetings as part of your behavior management system? Y N

Please use the back to add any information that you think might be helpful in implementing this project.

Teacher _____

Grade _____

TEACHING OURSELVES POSITIVE SKILLS (TOPS)

Teaching Ourselves Positive Skills (TOPS) is a program designed to instruct elementary students with academic and social skills deficits how to work with classmates in a reciprocal game-like learning activity. It combines elements of classwide peer tutoring, direct instruction, positive reinforcement, and social skills training in a package intervention that helps students learn to work together for academic and social success.

Brief Background of ClassWide Peer Tutoring

TOPS, a reciprocal peer-tutoring program for students who need explicit instruction and practice in academic and social skills, is a variation of the research-based intervention used successfully for over 20 years at the Juniper Gardens Children's Project in Kansas City, Kansas, *ClassWide Peer Tutoring* (CWPT; Greenwood, Delquadri, & Carta, 1997). CWPT was originally designed to offer at-risk and disadvantaged elementary-age students in general education classrooms more opportunities to learn and practice basic academic skills using a systematic and engaging set of instructional components that combine reciprocal peer tutoring and group reinforcement in a game-like format. Features of CWPT include:

- ❑ Whole class participates in systematic practice of basic academic skills.
- ❑ Student pairs work together for one-week sessions.
- ❑ Pairs take turns acting as tutor and tutee within each session.
- ❑ Tutors give immediate feedback to tutees.
- ❑ Tutees correct wrong answers and repeat corrected responses.
- ❑ Progress is monitored with frequent evaluations.
- ❑ Tutor-pairs earn points for effort and correct answers.
- ❑ Class is divided into 2 teams that compete for social reinforcement.
- ❑ Individual, partner, and team points are posted.
- ❑ Winning team is declared at the end of each week.

Since its inception, CWPT and variations of peer-mediated instruction and interventions (e.g., PALS, Fuchs, Mathes, & Fuchs, 1996) have been shown to be effective in general and special education classrooms in improving academic achievement of students with diverse backgrounds and needs, including those with Learning Disabilities, Mental Disabilities, and Limited English Proficiency. Studies have demonstrated that social interactions and school survival skills (i.e., on-task behaviors) have improved while using peer-tutoring activities. Also, students and teachers in numerous peer-tutoring programs have expressed satisfaction with the technique (e.g., Bell, Young, Blair, & Nelson, 1990; Spencer, Scruggs, & Mastropieri, 2003).

Overview of TOPS

Although reciprocal peer tutoring has repeatedly demonstrated its efficacy with at-risk students and those with high incidence disabilities, there have been only a few research studies (e.g., Falk & Wehby, 2001; Locke & Fuchs, 1995) using these techniques with young students with emotional and behavioral disorders (EBD). Because many students with EBD have academic and school survival skill deficits, they too might benefit from a reciprocal peer-tutoring format.

Teachers of students with EBD may hesitate to introduce an academic program based on tutoring-pairs working together, as these students typically have difficulty getting along with each other in social and academic settings. Because of performance or skill deficits, classmates with EBD may not exhibit the following prerequisite reciprocal behaviors:

- ❑ Giving and taking directions from each other;
- ❑ Offering and accepting positive or corrective feedback from classmates;
- ❑ Asking for and providing help to peers.

In other words, the skills necessary for successful peer-tutoring interactions may be the very ones missing from the social repertoires of students with EBD.

Six features of TOPS are specifically designed to improve academic and social skills of students with EBD:

- *Social Skills Instruction*: Explicit training is provided to teach the tutor & tutee social skills required to successfully participate in the learning activity.
- *Procedural Prompts*: TOPS' rules, scripted cue cards, & procedural checklists for tutors, tutees, & teachers are included as visual reminders of expectations for implementation of this strategy.
- *Frequent Monitoring & Reinforcement by Teacher & Students*: Point sheets & answer cards are simple to use & provide records of progress. Partners earn points & social reinforcement for following the rules, working together, & good effort. Academic improvement is tracked & recorded daily.
- *Daily Partner & Group Meetings*: After each tutoring session, student-partners evaluate their performance by completing a self-assessment checklist. The whole group then meets to review progress. Here each student makes a positive statement about his partner's teamwork that day.
- *Whole Group Contingency*: A whole-group contingency, rather than a two-team competition, is used. Points earned by each partner are combined for a daily total. Partners' points accumulate toward the group daily and weekly total and may be exchanged for activity or small tangible reinforcers.
- *Generalization of Positive Partner Skills*: Students are given additional opportunities to practice partner skills & assess their behavior in a Center activity that parallels the academic tutoring task.

Academic Features

Individualized instruction
 Many opportunities to respond
 Multi-modal presentation
 Immediate feedback
 Active & errorless learning
 Appropriate responses reinforced
 Mastery of basic skills
 Efficient use of time & resources
 Frequent assessment



Social Features

Requisite social skills taught & modeled
 Students participate in both roles
 Partners gain by helping each other
 Effort & mastery reinforced
 On-task behaviors rewarded
 Students learn to self-assess
 Positive statements in meetings
 Group goals shared by whole class
 Social skills generalized across settings

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Overview of TOPS – *Teaching Ourselves Positive Skills*

- I. Introductions
- II. Rationale for TOPS
 - A. Academic and behavioral deficits of students with EBD
 - B. CWPT
 - C. Unique Features of TOPS
 - 1. Social skills instruction and procedural prompts
 - 2. Frequent teacher- and self-monitoring and reinforcement
 - 3. Opportunity to practice skills in student-directed setting
- III. Will the use of TOPS
 - A. Increase academic scores from pretest to posttest and on daily probes?
 - B. Increase positive behavior in a student-directed generalized setting?
 - C. Decrease negative behavior in a student-directed generalized setting?
- IV. Choosing students with academic and behavioral deficits
 - A. Teacher Nomination
 - 1. Whole group intervention and contingency
 - 2. Whole group – introduce intervention to student pairs sequentially
 - 3. Pull-out for selected student pairs
 - B. IEP Goals and Objectives
 - C. Standardized Tests
 - 1. Walker-McConnell Scale of Social Competence & School Adjustment
 - 2. Scale for Assessing Emotional Disturbance
 - 3. Woodcock Johnson
 - D. Direct Observation
- V. Procedure
 - A. 4-Session Training – Teaching Positive Partner Skills
 - 1. What are Positive Partner Skills – TOPS Rules and Expectations
 - 2. Learning Coach and Player Skills – Define, Model, Role-Play, Feedback
 - 3. How to Evaluate Ourselves – Teacher and Partner Assessment
 - 4. How to Report Our Progress – Sharing Scores and Making Positive Statements
 - B. Playing TOPS (math example)
 - 1. Set-Up
 - 2. Practice Round
 - 3. Partner Round
 - C. Evaluation
 - 1. Teacher Point Cards
 - 2. Partner Assessment
 - 3. Group Meeting
- VI. Student-Directed Setting – Generalization of Positive Partner Skills
 - A. New flash card activity; access to TOPS rules, folders, and timer
 - B. No requirement to write responses or follow TOPS procedures
 - C. Partner-assessment checklist – earn points toward group (or partner) contingency
- VII. Individualizing TOPS for your students
 - A. Choosing student pairs
 - B. Selecting 2 or 3 academic skills' areas and number of cards per session
 - C. Deciding length of tutor sessions
 - D. Reinforcement menu for group contingency
 - E. Age-appropriate social skills examples, wording, and graphics

APPENDIX B

CONSENT AND ASSENT

**Augusta State University
INFORMED CONSENT FORM**

Dear Parents,

You are invited to allow your child to take part in a collaborative research project between his school and Augusta State University. We would like your child to participate in a new intervention that I designed to help children improve their math skills and their relationships with others. This program, called *Teaching Ourselves Positive Skills* or TOPS, is based on well-established teaching practices, including peer-tutoring and positive reinforcement, as well as my own experience teaching young students. Presently, I am an assistant professor in Special Education at Augusta State University. Before moving to Augusta last year, I spent 8 years teaching students with learning and social skills problems in Raleigh, NC.

PROCEDURES: I will be working with your child's classroom teacher 3 times a week to teach students how to use TOPS and supervise their participation in the strategy. The peer tutoring will last about ½ hour each time and extend for about 2 months. The academic subject we will work on is math, but TOPS will not take the place of daily math instruction. The extra lesson will give students more opportunities work together and practice math facts with the game-like activity.

Each student will be paired with a classmate and be taught the social skills needed to help each other learn. During TOPS, each student will get the chance to be the coach and the player. They will take turns for about 20 minutes and practice math facts they have not yet mastered with flash cards. Teachers will award points for helping each other, working hard, and playing by the rules. Students will also give themselves points for their good work. They will meet at the end of each TOPS session and talk about positive behaviors they and their partners demonstrated. The points will add up and be traded in for small treats or activity rewards throughout the program. Daily and weekly points will go toward earning a TOPS party at the end of the program.

OBSERVATION: I will observe and record how students work with their partners during each peer-tutoring session. Both positive and negative interactions will be marked. About once a week the sessions may be videotaped in order to make sure we are following the right steps for TOPS. Only those involved with the study will see the tapes and they will be destroyed at the end of the study. You may choose to allow your child to participate in TOPS and *not* be videotaped.

POTENTIAL RISKS: I don't expect any serious risks or discomfort for your child in participating in TOPS. At first, he/she may have a little trouble getting along with his/her partner, or may express negative comments or actions. The classroom teacher and I will be monitoring the tutoring-pairs at all times and we will give corrective feedback when we see a problem like this arise. Part of this program involves teaching students how to get along, so we will be prepared to offer alternative positive strategies to any negative behavior during the activity.

BENEFITS: TOPS is designed to help increase academic skills and improve relationships with classmates. Through the flashcard activity and practicing good social behavior, students can improve both their math skills and their ability to get along with others. At the end of this study, we will give you all math scores and behavior records so you can see the progress your child made during this program.

CONFIDENTIALITY: The information in written reports and videotapes will be kept strictly private. All materials will be stored securely and will be made available only to those conducting the study unless you specifically give permission in writing to do otherwise. We will not use any names or pictures of students in any oral or written reports.

COMPENSATION: There will be no monetary compensation for participation in this study. We will offer students small treats (such as stickers, markers, small toys) as reinforcers for positive efforts

and cooperation throughout the project. As a reward for working together and earning points, students will have a TOPS party the last day of the program.

FREEDOM TO WITHDRAW: The participation of your child in TOPS is completely voluntary. There will be no problem with you deciding at any time during the project that you would like your child to stop participating. Immediately after you tell his/her teacher or me that you would like to withdraw your child, he/she will be given an alternative individual assignment during the ½ hour TOPS activity. He/she will keep all reinforcers he/she earned to that point. Also, we will share with you all math scores and behavior records collected during his/her participation.

YOUR CHILD'S ASSENT: If you agree to have your child participate in TOPS, we will talk to him/her before we begin and explain the program and what will happen during TOPS sessions. We will ask each child if he/she has any questions, and after answering them, we will ask him/her to participate in TOPS. He/she has the right to withdraw from the program at any time.

CONSENT

PLEASE SIGN BOTH COPIES OF THIS LETTER DESCRIBING THE STUDY. KEEP ONE COPY FOR YOUR RECORDS AND RETURN ONE COPY TO YOUR CHILD'S CLASSROOM TEACHER.

YOUR CHILD'S NAME _____

I have read and understand the above information. I have received a copy of this form.

A. PLEASE CHECK ONE:

1. () I *give* my permission for my child to participate in the study described in this letter.
2. () I do *not* give my permission for my child to participate in the study described in this letter.

B. PLEASE CHECK ONE IF YOU CHECKED A-1 ABOVE:

1. () I give my permission for my child to be videotaped or photographed as described in this letter.
2. () I do *not* give my permission for my child to be videotaped or photographed as described in this letter.

Parent's or Guardian's Signature

Date _____

Investigator's Signature

Date _____

CONTACT

If you have questions at any time about the study or the procedures described in this letter, please contact me:

Ms. Chan Evans

Department of Clinical and Professional Studies, Augusta State University

706-667-4505 revans5@aug.edu

Research at Augusta State University is conducted under the guidance of the Oversight Committee on Human and Animal Research. Questions regarding the review process should be directed to the Chair of the committee:

Dr. McKinley Thomas

Department of Kinesiology and Health Science, Augusta State University

2500 Walton Way, Augusta, GA 30904 bthomas@aug.edu

STUDENT ASSENT

Hi (student's name). I'm going to talk to you about joining the class to participate in a learning game called TOPS. During the game, a classmate will be your partner and you will help each other learn math facts. You'll take turns being the Coach and the Player and you'll be able to earn points by helping each other, working hard, and playing by the rules. Ms. (classroom teacher) and I will mark point cards for positive behavior and you and your partner will give yourselves points, too. We'll end each game with a short meeting where you'll tell us how many points you and your partner earned. I'll be coming to your class 3 days each week for about 2 months to help you play TOPS. Each game will last about $\frac{1}{2}$ hour. You'll still have your regular math class each day, so TOPS will be an extra and fun way to learn your (____) facts. As a reward for working together and earning points, we will have a TOPS party the last day of the program. Your parent has given us permission for you to participate in this activity. If you decide you do not want to continue playing TOPS, you can let me know and Ms. (teacher) will give you different work during TOPS time. You can keep all the treats you earned while you played TOPS. Do you have any questions?

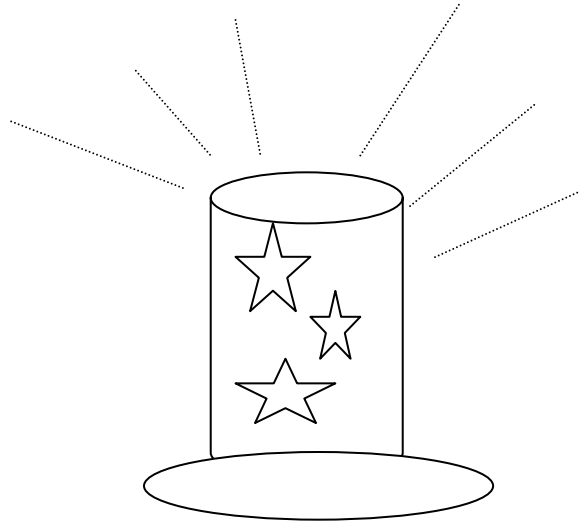
Would you like to participate with us?

APPENDIX C

MATERIALS FOR TOPS TIME

PARTNER

PARTNER



HOW TO EARN STARS

I. Follow TOPS Rules

Talk softly.
Take turns.
Stay on-task.
Try Your Best.
Work Together!

II. Practice Positive Partner Skills

COACH Skills

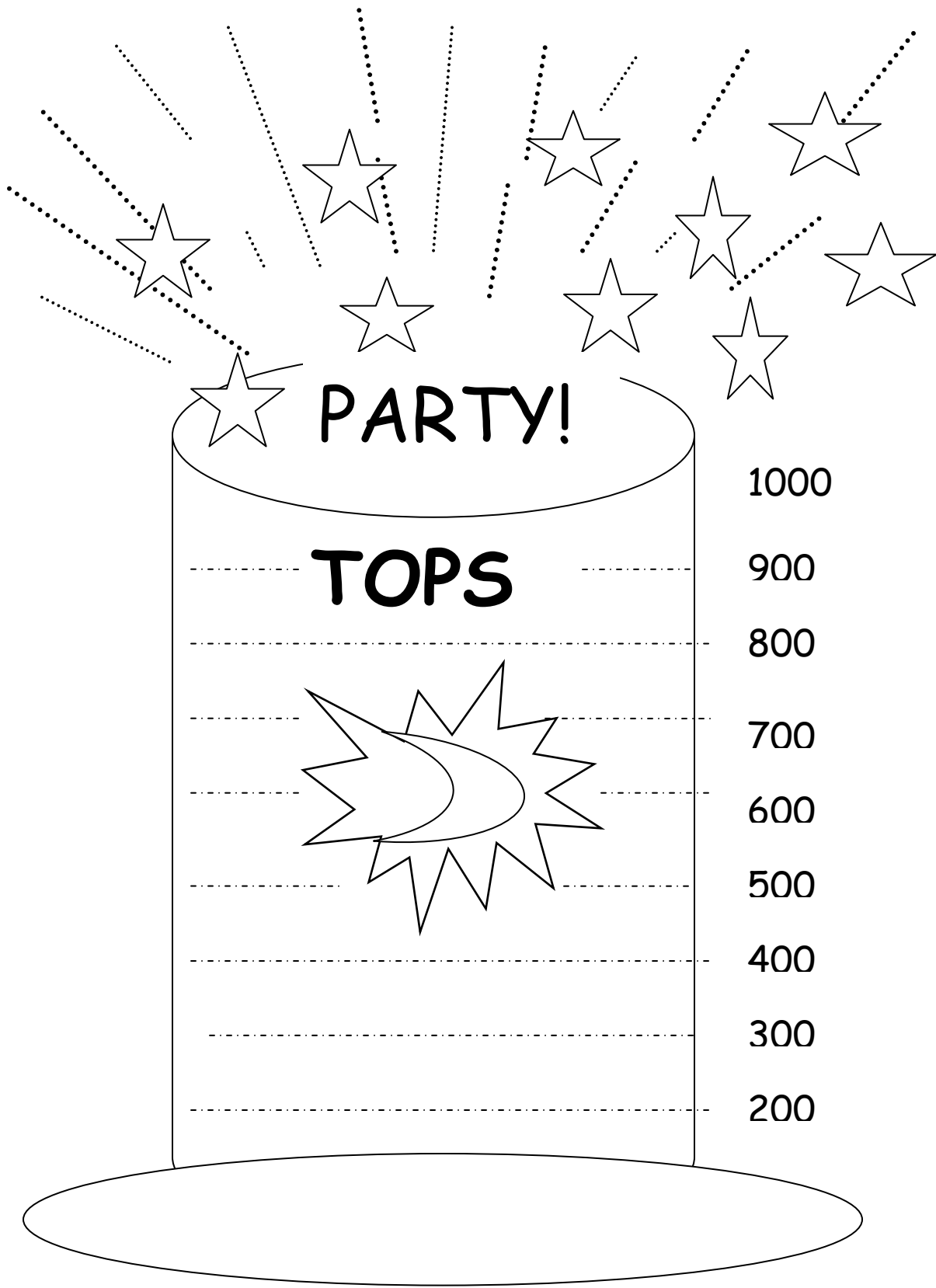
Give clear directions.
Give good feedback.

PLAYER Skills

Follow directions quickly.
Accept feedback politely.

Try to work it out before asking for Teacher help.





REACH FOR THE TOPS!

I. Practice: "Let's SAY these."

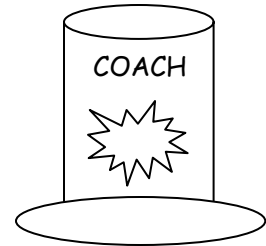
II. "What is _____?" or "Spell _____."

1. If Correct: YES! If NO: NO. and say the answer.

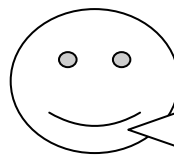
2. "Let's SAY it." 3. "Let's WRITE it."

4. "Let's READ it."

5. GREAT JOB!



I need help.



Let's work it out!

IF YOU HAVE A PROBLEM

1. Ask partner for help.
2. Listen to the answer.
3. Try to work it out.
4. Ask for teacher help.

Please HELP us.

Partners _____

Date _____



STARS for Today



TOPS Rules		Total
Talk softly		
Take turns		
Stay on-task		
Try your best		
Work together		
Positive Partner Skills		Total
Give Clear Directions		
Give Good Feedback		
Follow Directions Quickly		
Accept Feedback Politely		
Try to work it out before asking for Teacher help.		
DAILY TOTAL		



PARTNER CHECKLIST

Names _____

Date _____

DID WE FOLLOW TOPS RULES?	YES = 2	Some of the time = 1	NO= 0
Talk softly?			
Take turns?			
Stay on-task?			
Try our best?			
Work together?			

DID WE PRACTICE POSITIVE PARTNER SKILLS?	YES = 2	Some of the time = 1	NO = 0
Give clear directions?			
Follow directions quickly?			
Give good feedback?			
Accept feedback politely?			
Try to work it out before asking for help?			
TOTALS Partner CHECKLIST			
COACH and PLAYER PRACTICE Cards	+		
Teacher STAR Card	+		
TODAY'S TOTAL			

TOPS Store

Item	Points
Bear	300
Sticker Book	300
Activity Pad	300
Stencil Book	300
10 Markers	250
Mr. Bubbles	250
Little Car	300
2 Colorful Pencils	100
2 Star Erasers	100
Little game	150
Nick Stencil	100
Motorcycle	400
Race Car	400
Doll dress	400
2 Necklaces	300

Partner Points for Week _____

<u>STUDENTS</u>						
Saved POINTS						
Daily TOPS TOTAL						
Daily QUIZ TOTAL 2 pts @ correct						
WEEK TOTAL						
TOPS Store POINTS						
- <u>SPEND</u>						
Points Saved						

COACH PRACTICE and SCORE CARD

1 st Player			2 nd Player		
Correct 1 st Try 2	Circle each word as you say it.	1 st COACH Write	Correct 1 st Try 2	Circle each word as you say it.	2 nd COACH Write
YES! 2	1. Let's SAY WRITE READ GREAT JOB!		YES! 2	1. Let's SAY WRITE READ GREAT JOB!	
YES! 2	2. Let's SAY WRITE READ GREAT JOB!		YES! 2	2. Let's SAY WRITE READ GREAT JOB!	
YES! 2	3. Let's SAY WRITE READ GREAT JOB!		YES! 2	3. Let's SAY WRITE READ GREAT JOB!	
YES! 2	4. Let's SAY WRITE READ GREAT JOB!		YES! 2	4. Let's SAY WRITE READ GREAT JOB!	
YES! 2	5. Let's SAY WRITE READ GREAT JOB!		YES! 2	5. Let's SAY WRITE READ GREAT JOB!	
<u>Coach Points</u> 1 each for SAY-WRITE-READ-GREAT JOB! + 1 each for "Coach Write" (count by 5s) = 5 (x 10) = 50					
<u>Player Points</u> 2 each for "Correct 1 st Try" (count by 2s) + + 1 each for "Player Write" (count by 1s) = 3 (x 10) = 30					
COACH & PLAYER TOTAL					

PLAYER WRITE CARD

<u>1st PLAYER Write</u>		<u>2nd PLAYER Write</u>	
1.		1.	
2.		2.	
3.		3.	
4.		4.	
5.		5.	

COACH PRACTICE

YES! Let's SAY-WRITE-READ. GREAT Job!



COACH PRACTICE

YES! Let's SAY-WRITE-READ. GREAT Job!

1 st Player Correct 1 st Try (YES! 2)	1 st COACH Write	Partner Checklist 2 / 1 / 0 Did we...	2 nd Player Correct 1 st Try (YES! 2)	2 nd COACH Write
YES! 2	1.	Talk Softly? __	YES! 2	1.
YES! 2	2.	Take Turns? __	YES! 2	2.
YES! 2	3.	Try Our Best? __	YES! 2	3.
YES! 2	4.	Use Coach Skills? __	YES! 2	4.
YES! 2	5.	Use Player Skills? __	YES! 2	5.

Coach Points

1 each for SAY-WRITE-READ-GREAT Job!

+ 1 each for "Coach Write" (count by 5s) = 5 (x 10) = 50

Player Points

2 each for "Correct 1st Try" (count by 2s)

+ 1 each for "Player Write" (count by 1s) = 3 (x 10) = 30

Partner Checklist

= 10

Teacher Match Bonus

= 10

POSSIBLE POINTS = 100

Flash Card Points

Coach _____ + Player _____ = _____

Partner Checklist Points

= _____

Teacher Match Points

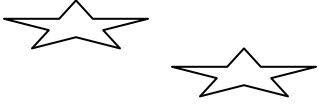
= _____

TOPS TOTAL =

APPENDIX D

MATERIALS FOR CENTER TIME

Short Game Cue Card



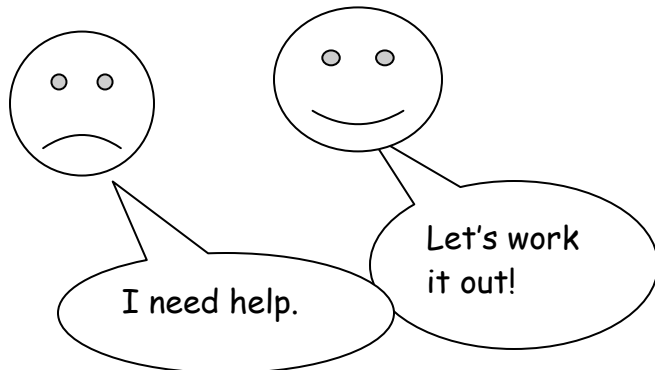
TOPS SHORT GAME

1. Show the card.
2. Ask the question.
3. If Correct: YES!
- If not: No.

and say the answer.

4. Give Positive Feedback.

GREAT JOB!



IF YOU HAVE A PROBLEM

1. Ask partner for help.
2. Listen to the answer.
3. Try to work it out.
4. Ask for teacher help.

Please HELP us.

Coach Check

Make a mark each time you do these.

1. Show and Ask	
2. If correct, "YES!" If not, "No" and Help your partner.	
3. Positive Feedback	

Coach Check

Make a mark each time you do these.

1. Show and Ask	
2. If correct, "YES!" If not, "No" and Help your partner.	
3. Positive Feedback	



CENTER PARTNER CHECKLIST

Names _____

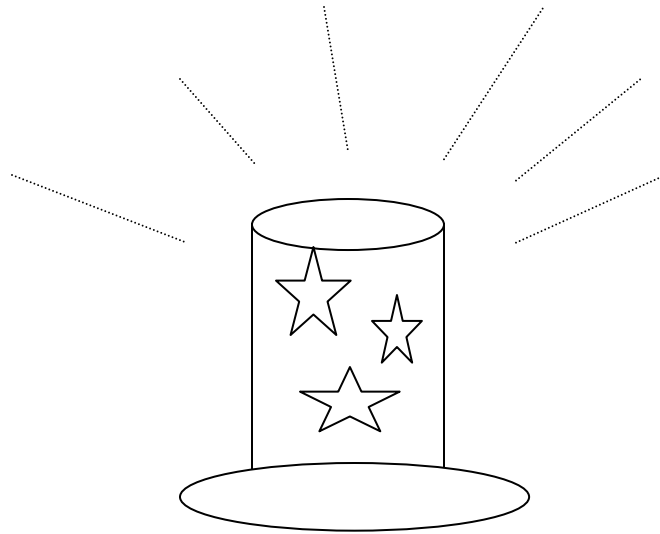
Date _____

DID WE FOLLOW TOPS RULES?	YES = 2	Some of the time = 1	NO = 0
Talk softly?			
Take turn			
Stay on-task?			
Try our best?			
Work together?			

DID WE PRACTICE POSITIVE PARTNER SKILLS?	YES = 2	Some of the time = 1	NO = 0
Give clear directions?			
Follow directions quickly?			
Give good feedback?			
Accept feedback politely?			
Try to work it out before asking for help?			
CENTER PARTNER CHECKLIST TOTAL			

Partner

Partner



TOPS CENTER

I. Follow TOPS Rules

Talk softly.

Take turns.

Stay on-task.

Try Your Best.

Work Together!

II. Practice Positive Partner Skills

COACH Skills

Give clear directions.

Give good feedback.

PLAYER Skills

Follow directions quickly.

Accept feedback politely.

Try to work it out before asking for Teacher help.



APPENDIX E

PROCEDURAL FIDELITY AND BEHAVIOR RECORDING FORMS

Training Record & Procedural Fidelity Check

Day 1 Date _____ Time _____ Checker _____

WHO	WHEN	WHAT	HOW	Material	Did the trainer..?
Trainer & Teacher All Students	5 min	Overview	Explain each term & give examples Teaching - Ourselves - Positive Skills	Teaching Ourselves Positive Skills	Explain TOPS & each word? Y Sm N
Whole-group activity; dyads sit next to each other, facing the front of the class for explanation; face each other for peer-tutor activities.	10 min	TOPS RULES	Tutor/Tutee – Coach-Player Game/Prizes- If you follow the rules, you will win prizes for partners and for the whole class. State, explain, model, & student practice each rule.	How To Earn Stars I.TOPS RULES	Explain Coach/Player Y Sm N Explain & Model TOPS RULES? Poster Y Sm N
Trainer & Teacher explain each component. Students participate by giving examples, modeling with teacher, then practicing each step with partner. Teachers monitor each training phase, giving specific praise, marking cards for correct responses. Correct procedural or behavioral errors immediately with corrective feedback.	5min	Earning Teacher Points		Stars for Today	Describe Teacher Point Card? Y Sm N
	10 min	Assigning Pairs	Teacher announces pairs; hands out 1 folder to each pair. Students take turns coloring & writing their names. Teacher circulates, praises, & marks points.	TOPS STORE	AssignPairs? Y Sm N Show Prizes? Y Sm N How many Stars for each prize? - Poster Y Sm N
	1 min	Closure/ Transition	Quick review & preview. Praise. Collect folders.	Partner Points For Week Partner Folder	Distribute folders? Y Sm N Wkly Partner Pts.-Poster Y Sm N Ask for Assent Y Sm N Review Rules Y Sm N

Notes:

Day 2 Date _____ Time _____ Checker _____

WHO	WHEN	WHAT	HOW	Materials	Did the trainer...?
Trainer & Teacher	10 min	Set-up & Review	Teacher directs students to move together for TOPS. When settled and quiet, teacher hands out TOPS' folders. Review Rules, & how to earn stars. Students place (teacher) STAR cards on desk.	Partner Folder How to Earn Stars-cover	Review TOPS & Rules? Y Sm N
All Students				STARS for Today	Review Point cards? Y Sm N
Teacher circulates, praises appropriate behaviors, corrects errors, and marks Star cards.	20min	Positive Partner Skills	How to practice Positive Partner Skills. Explain & Examples of 4 skills Roles of Coach/Player: Directions, Feedback,	II. Practice Positive Partner Skills Cue Card Please Help	Explain/Examples Coach/Player Y Sm N Explain & Model Positive Partner Skills? Y Sm N Nonexamples Y Sm N
			Demonstrate procedure for working it out; Help card	If You Have a Problem Poster	<u>Explain & Model?</u> Ask – Listen – Try to work it out. Y Sm N
	2 min	Close/Transition	Quick review & preview of afternoon session. Praise. Collect folders & pt. cards.		Ask for Teacher Help Y Sm N Review ? Y Sm N Preview next session? Y Sm N

Notes:

Day 3 Date _____ Time _____ Checker _____

WHO	WHEN	WHAT	HOW	Materials	Did the trainer...?
Trainer & Teacher	1 min	Set-up & Review	Teacher directs students to move together for TOPS. When settled - folders. Review. Star cards on desk.	Partner Folder Rules Positive Partner Skills STAR cards	Review TOPS, Rules, & Skills? Y Sm N Review T. pt. cards? Y Sm N
All Students	8 min	Tutor Procedure How to use cue cards, flash cards, & ask facts. ROUNDS Practice Partner Final	Teacher calls out each step as tutors/tutees read cue cards & practice Say-write-read Practice math facts Coach-Lead activity circles 2s Both-Write answers	Cue Cards Timer Pencils Blue Practice & Yellow Score Cards Cue Card Flash Cards Answer Card	Review Work It Out Y Sm N Teach & Model steps for Practice Round? Y Sm N Partner Round? Y Sm N Final Round? Y Sm N
Teacher circulates, praises appropriate behaviors, corrects errors, and marks Star cards. Encourages accuracy and speed.	5 min	Checking & giving positive & corrective feedback Self-Evaluation Add Scores	Player-follow directions, say, write, read Partners evaluate behavior, giving points for following Rules and Partner behaviors Add Coach Score card, Teacher Stars, & self-assessment for grand total.	Partner Checklist	Explain & model self-assessment checklist? Y Sm N Explain & model how to make a Positive Statement? Y Sm N
Teacher reviews today's progress of pairs and group.	5 min	Group Meet Positive Statement	Report Points Pairs make Positive Statements about partners. Quick review & preview.	Partner Points For Week	Have students enter points on Week chart? Y Sm N Review ? Y Sm N Preview next ? Y Sm N
	1 min	Close/ Transition			

Notes:

PROCEDURAL FIDELITY CHECK – LONG FORM

Time: _____ Date: _____ Rater: _____

1st COACH: _____ 1st PLAYER: _____

✓ Check = Yes; X = No; ? = Somewhat or Don't Know; T= teacher correction or intervene

Did 1 st COACH					Did 1 st PLAYER				
1. Ask the question: "What is ____?" "Spell ____."					2. Answer quickly.				
3. If correct, check & say: "YES!"					4. If don't know, say: "I don't know."				
5. If don't know, say: "OK" & say the answer. If incorrect, say: "No" & correct answer. (no arguing)					6. Accept corrective feedback politely. (No Arguing)				
7. Say: "Let's say it."									
8. Say together.					9. Say together.				
10. Say: "Let's write it."									
11. Write answer on Practice Card.					12. Write answer on Answer Card.				
13. Say: "Let's read it."									
14. Read together.					15. Read together.				
16. Say: "Great job!" (Good Work!)					17. Wait quietly for next card.				

Did 2 nd COACH					Did 2 nd PLAYER				
1. Ask the question: "What is ____?" "Spell ____."					2. Answer quickly.				
3. If correct, check & "YES!"					4. If don't know, say: "I don't know."				
5. If don't know, say: "OK" & say the answer. If incorrect, say: "No" & correct answer (No argue)					6. Accept corrective feedback politely. (No Arguing)				
7. Say: "Let's say it."									
8. Say together.					9. Say together.				
10. Say: "Let's write it."									
11. Write on Practice Card.					12. Write on Answer Card.				
13. Say: "Let's read it."									
14. Read together.					15. Read together.				
16. Say: "Great job!" (Good Work!)					17. Wait quietly for next card.				

PROCEDURAL FIDELITY CHECK – SHORT FORM

<u>Date</u>	TOPS Rules- 6 pts	Coach Skills- 2 pts	Player Skills - 2 pts	Student Match?
	Talk softly. Take turns. Try your best.	Give clear directions. Give good feedback. [Try to work it out.]	Follow directions quickly. Accept feedback politely. [Try to work it out.]	
<u>Partners</u>				
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO

NOTES:

<u>Date</u>	TOPS Rules- 6 pts	Coach Skills- 2 pts	Player Skills - 2 pts	Student Match?
	Talk softly. Take turns. Try your best.	Give clear directions. Give good feedback. [Try to work it out.]	Follow directions quickly. Accept feedback politely. [Try to work it out.]	
<u>Partners</u>				
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO
	6 5 4 3 2 1 all most some few	2 1 0 all some none	2 1 0 all some none	YES NO

NOTES:

STUDENTS _____ DATE _____
TASK _____

- [illegible]

[illegible][illegible][illegible]**Total**

0/ not observed / = %

Total

0/ not observed / = %

APPENDIX F

ACADEMIC PROBES

1-Minute Addition Probe

$$\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +6 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +10 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +8 \\ \hline \end{array}$$

Spelling Word Sets

Spell I

Black

Boots

Glove

Heart

Jeans

Mouse

Phone

Pink

Star

Watch

Spell II

Boat

Book

Coat

Globe

Rock

Ship

Shirt

Socks

Walk

Water

1-Minute Subtraction Probe

$$\begin{array}{r} 9 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ - 5 \\ \hline \end{array}$$

APPENDIX G

TEACHER AND STUDENT ACCEPTABILITY SURVEYS

TOPS Post-Training Acceptability Survey

After observing your students participate in the training sessions for TOPS, please circle the number that most closely represents your opinion about this intervention at this point.

	Strongly Disagree		Neutral		Strongly Agree
The TOPS intervention:	<u>1</u>		<u>3</u>		<u>5</u>
1. will fit into our daily classroom schedule.	1	2	3	4	5
2. procedure is too long for most of my students to stay engaged the entire session.	1	2	3	4	5
3. is easy enough for most of my students to learn to play without teacher guidance.	1	2	3	4	5
4. will help my students improve their peer - sharing skills.	1	2	3	4	5
5. rules are compatible with our classroom behavior management system.	1	2	3	4	5
6. will help my students improve their academic skills.	1	2	3	4	5
7. will help my students learn important test-taking strategies.	1	2	3	4	5
8. self-assessment partner checklist will not be a helpful way to teach generalization of self-monitoring skills.	1	2	3	4	5
9. is within my skill level to implement.	1	2	3	4	5
10. will have lasting positive academic effects on my students.	1	2	3	4	5
11. point system will be popular with my students.	1	2	3	4	5
12. skills of sharing and giving positive feedback will be practiced by my students in other less structured settings.	1	2	3	4	5
13. is compatible enough with our academic and social program to continue after this project ends.	1	2	3	4	5
14. will be acceptable to my students' parents.	1	2	3	4	5

Please use the back to add comments or opinions about matters not addressed in the survey.

Teacher

Date

TOPS Post-Intervention Acceptability Rating Survey

After observing your students participate in TOPS for 6 weeks, please circle the number that most closely represents your opinion about this intervention.

	Strongly Disagree	1	2	3	4	Strongly Agree
The TOPS intervention:		<u>1</u>		<u>3</u>		<u>5</u>
1. fit into our daily classroom schedule.		1	2	3	4	5
2. procedure was too long for most of my students to stay engaged the entire session.		1	2	3	4	5
3. was easy enough for most of my students to learn to play without teacher guidance.		1	2	3	4	5
4. helped my students improve their academic skills:						
MATH		1	2	3	4	5
SPELLING		1	2	3	4	5
US STATES		1	2	3	4	5
5. rules were compatible with our classroom behavior management system.		1	2	3	4	5
6. helped my students improve their peer - sharing skills.		1	2	3	4	5
7. helped my students learn important test-taking strategies.		1	2	3	4	5
8. self-assessment partner checklist was not a helpful way to teach generalization of self-monitoring skills.		1	2	3	4	5
9. was within my skill level to implement.		1	2	3	4	5
10. will have lasting positive academic effects on my students.		1	2	3	4	5
11. point system was popular with my students.		1	2	3	4	5
12. skills of sharing and giving positive feedback were practiced by my students in other less structured settings.		1	2	3	4	5
13. is compatible enough with our academic and social program to continue after this project ends.		1	2	3	4	5
14. will be acceptable to my students' parents.		1	2	3	4	5

Please use the back to add comments or opinions about matters not addressed in the survey.

Teacher _____ Date _____

TOPS Post-Training Student Survey

Answer each question by circling the word or face that best describes what you think about TOPS.

- | | NO | Some of it. | YES. |
|---|---|---|---|
| 1. I know about how to play the TOPS game. |  |  |  |
| 2. The rules of TOPS are easy to follow. |  |  |  |
| 3. I can do all the steps of TOPS with my partner. |  |  |  |
| 4. I like sharing the Points I earn with my partner. |  |  |  |
| 5. I think playing TOPS will help me learn math skills. |  |  |  |
| 6. I think playing TOPS will help me get along with my classmates better. |  |  |  |

TOPS Post-Intervention Student Survey

Think about playing TOPS for the last 6 weeks and remember: (1) What you did, (2) What you learned, (3) What you liked, (4) What you did not like. Circle the face and word that best describes what you now think about TOPS.

	NO	Some of it	YES
1. I learned how to play the TOPS game.			

	NO	Some of them	YES
2. The rules of TOPS were easy to follow.			

	NO	Some of them	YES
3. I did most of the steps of TOPS with my partner without teacher help.			

	NO	Some of the time	YES
4. I liked sharing points I earned with my partner.			

	NO	Some of them	YES
5. I think playing TOPS helped me learn:			
Math facts			
Spelling words			
US States			

	NO	Some of the time	YES
6. I think playing TOPS helped me get along with my classmates better.			

	NO	Some of the time	YES
7. I think other classrooms should use TOPS to practice positive skills.			

8. One thing I did NOT like was _____.

9. My favorite part of TOPS was _____.