

RECIPROCAL PEER TUTORING AND TREATMENT INTEGRITY OF
ELEMENTARY SCHOOL STUDENTS

A Thesis

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Master of Arts

in

The Department of Psychology

by
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B.S., Louisiana State University, 2001
December 2005

Acknowledgments

I would like to thank Dr. George H. Noell for his valuable guidance and mentoring throughout the thesis process. I would also like to thank Dr. Kristin Gansle and Dr. Nathan Call for giving their time to be members of my thesis committee, and offering their knowledge to increase the quality of this thesis. I also thank my colleagues who assisted in the process either through their participation or guidance. Finally, I would like to sincerely thank Claire Esteve for her tireless dedication and support.

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Abstract

Academic concerns are the most common reason students are referred for special services in schools. This obviously leads to the necessity for schools to have secondary prevention services in place to address the needs of students who are struggling. Peer tutoring, in its various forms, has been well documented as an effective and inexpensive intervention for all academic areas. Despite the promise of peer tutoring, research evidence suggests that teachers may not consistently carry out their roles in the peer tutoring process with sufficient accuracy to ensure positive outcomes. One possible solution to this problem is to have a consultant directly monitor the intervention. The purpose of this study was to use the well established procedures of Reciprocal Peer Tutoring and Classwide Peer Tutoring to develop an effective peer tutoring process that can be implemented with an absolute minimum of teacher involvement. Students were responsible for initiating the tutoring sessions, collecting data, evaluating their performances, and administering rewards. Students' work was evaluated and monitored by the consultant rather than the teacher. The results demonstrated that the students implemented the reciprocal peer tutoring procedures with high accuracy and integrity. As a result, the students showed increases in their sight word acquisition. Limitations and future directions are discussed.

Introduction

Academic concerns are the most common reason students are referred for special services in schools (Lloyd, Kauffman, Landrum, & Roe, 1991). This creates the necessity for schools to have secondary prevention services in place to address the needs of students who are struggling. A recent investigation by Buck, Polloway, Smith-Thomas, and Cook (2003) found that all fifty American States and the District of Columbia currently utilize Pre-referral Intervention Teams (PITs), which work at the individual school level to evaluate and assist students referred for academic and behavioral problems. PITs operate from a model that typically emphasizes: (1) prevention (interventions are developed and implemented before a formal special education evaluation), (2) a problem-solving approach (team members review data concerning the referred student, develop hypothesis concerning the student's difficulties, and develop strategies to remediate those difficulties), (3) an action-research oriented approach (interventions are developed to meet the needs of the referred student, and they are evaluated for effectiveness), and (4) an intervention process that enhances the success of the student and teacher with the general education setting and curriculum (Buck, Polloway, & Smith-Thomas 2003). When implemented accurately, this intervention model assures that the referred student is provided with an appropriate and effective intervention in the least restrictive environment. However, due to the lack of federal education guidelines regarding pre-referral interventions, it is the responsibility individual state officials to design pre-referral intervention models. The lack of federal guidelines has created substantial amount variability between states concerning ownership (who is in charge of the pre-referral process), size (the number of members

needed for a PIT), the types of problems addressed by the PIT, the level of involvement of each member, terminology (the labels given to members and processes), and status (whether the pre-referral process is mandated, encouraged, or left to the discretion of the school district) (Buck et al., Carter & Sugai, 1989). This variability is extremely troublesome considering the important role intervention outcomes play in determining the future of referred students. For example, a student referred for early reading struggles may or may not be recommended for special education based on the outcome of his/her intervention.

Compounding the problem with the current pre-referral process, recent studies have identified another glaring problem with this pre-referral procedure. The results of recent studies have revealed that teachers often do not implement prescribed interventions with accuracy and integrity (Witt, Noell, LaFluer, & Mortenson, 1997; Noell, Witt, Gilbertson, Ranier, & Freeland, 1997). The lack of intervention implementation is certainly understandable due to the adverse conditions in which some teachers work (overcrowded classrooms, insufficient resources, lack of support); however, these are not acceptable reasons due to the substantive consequences the lack of implementation may carry. The findings of Noell et al. (1997) and Witt et al. (1997) highlight the need for finding additional models for intervention implementation.

One possible solution is the use of peer-mediated interventions. Peer-mediated interventions enable a student to conduct the intervention, leaving the teacher to supervise rather participate in the intervention. There are many peer-mediated academic interventions available that can be successful in increasing students' academic functioning. One of these interventions is Reciprocal Peer Tutoring (RPT). In 1984, John

Fantuzzo and his colleagues developed and tested a reciprocal peer tutoring strategy for children with academic needs (Pigott, Fantuzzo, Heggie, & Clement, 1984; Wolfe, Fantuzzo, & Wolter, 1984). In this procedure, students assembled in groups of two or more are trained to work together on a specific academic task. The students work together to prompt, monitor and evaluate each other, while working toward group goals (Fantuzzo, Polite, & Grayson, 1990). The students alternate between the roles of tutor and tutee in groups of two. In larger groups of three or four, roles of a group monitor and an evaluator are added to the procedure. Students work together in their groups to achieve established goals or rewards that are contingent upon group performance. The procedure has been effective in increasing academic performance in the areas of mathematics (Fantuzzo et al., 1990; Fantuzzo, King, & Heller, 1992; Pigott et al., 1984; Pigott, Fantuzzo, & Clement, 1986; Wolfe et al., 1984; Wolfe, Fantuzzo, & Wolfe 1986) and vocabulary (Malone & McLaughlin, 1997).

Nearly simultaneously in 1983, Charles Greenwood and colleagues developed Classwide Peer Tutoring (CWPT). CWPT incorporates similar principles as RPT (grouping of students to prompt, monitor and evaluate each other), and was initially designed to prevent future academic failure in poor and culturally diverse schools (Delquadri, Greenwood, Stretton, & Hall, 1983). Since its development, CWPT has proven to be effective in the areas of spelling, vocabulary, reading, mathematics, social studies, and science (Greenwood, Carta, & Maheady, 1991). Both RPT and CWPT studies have reported secondary gains for students in the form of increased social attractiveness among peers (Fantuzzo et al., 1986) and decreased behavior problems (Greenwood et al., 1991).

Three of the basic principles underlying RPT and CWPT interventions are increasing academic engagement, increasing the opportunity to respond, and increasing timely feedback regarding students' responses (Greenwood et al., 1991). Another important component of RPT and CWPT is the incorporation of group rewards contingent upon the performance of each group member. Both RPT and CWPT procedures are presented to students in a game format. RPT requires that the students set a goal to be reached for each session, and the students earn points for correctly responding on academic tasks. This requires each member of the group to contribute to the attainment of the goal, and ensures that no one person can be responsible for the group's success. For CWPT, groups earn points for correct responding on academic tasks, for correcting wrong responses, and tutors can earn bonus points for appropriate tutoring behavior. Again, the success of the group is contingent upon the performance of the individuals in that group. Fantuzzo and his colleagues have examined the effects of RPT with and without group contingencies (Fantuzzo et al., 1992; Fantuzzo et al., 1990). Both studies showed that conditions containing both RPT and a group-contingent reward showed greater increases in math performance than those conditions that had either a RPT condition only or a reward condition only.

Peer tutoring procedures have been demonstrated to be very effective in the area of reading with both typically developing children and those with disabilities. Fisher (2001) had twenty-two seventh grade students who were struggling with reading tutor second grade students in reading. The tutors were provided with grade appropriate reading materials for the second graders, and given a chance to practice the text and prepare questions they would ask the tutees about the readings. Twice per week the tutor

would read to the second grade tutees and ask them questions pertaining to the text. On the days tutoring did not occur, the tutors wrote in a journal about their experiences tutoring the second grade students. During the course of the tutoring program, the tutors showed increases in reading fluency (they read more quickly and without hesitation) and accuracy (made fewer mistakes). In addition, observations of the tutors' journals showed more fluent and expressive entries as the peer tutoring program progressed. Standardized tests conducted at the beginning and end of the school year showed greater gains in vocabulary and reading comprehension for those students who participated in the peer tutoring program, as compared to an equivalent control group of students who did not participate in the peer tutoring program.

Slaned and Nowack (1988) utilized peer tutoring to decrease the number of errors in oral reading rate committed by students identified as learning disabled. Six students were placed into dyads based on reading ability. The three dyads consisted of a tutor and a tutee. During the intervention the tutor would read a passage to the tutee and the tutee would follow along with a photocopy of the passage. The tutee would then read the passage back to the tutor, while the teacher recorded oral reading errors. For all three tutees in the study, oral reading errors decreased significantly as compared to baseline rates.

Mastropieri, Scruggs, Mohler, Beranek, Spencer, Boon, and Talbott (2001) examined whether students in a special education classroom who had been diagnosed with learning disabilities or mild retardation could serve as effective peer tutors for one another in reading comprehension. They also compared the tutoring groups to a control group of students who received standard whole class instruction on measures of reading

comprehension. Prior to the five-week peer tutoring intervention, twenty-four students were ranked according to reading ability. The twelve highest performing readers were paired with the twelve lowest performing readers. For each tutoring session, the tutee would read aloud from a teacher-selected book for five minutes, while the tutor followed along providing corrective feedback. After five minutes the students would switch roles and repeat the procedure. The higher performing student always began the session as the tutor. This procedure enabled the weaker reader to hear and see the passage prior to oral reading. Once the students became skilled at the tutoring procedure, the teacher introduced comprehension questions to the tutoring sessions. After each student orally read for five minutes, he/she would summarize what was just read and answer questions pertaining to the reading such as “what is the first thing you learned?” or “what is the most important thing about who or what in the text?” Prior to the peer tutoring intervention, the students in both the control group (standard classroom instruction) and in the tutoring group were assessed on measures of reading comprehension. Pre-intervention scores were low and not significantly different between the two groups. After five weeks the students were assessed again for reading comprehension. The peer tutoring group scored an average of 81.8% ($SD=13.9$) on reading comprehension measures, while the control group scored an average of 63.3% ($SD=17.2$). Follow-up interviews with both the students and the teachers showed positive opinions about the peer tutoring intervention. The authors also note that the teachers reported little off-task behavior with the tutoring groups, and only one of the student pairs had to be regrouped for better group compatibility.

Kamps, Barbetta, Leonard, and Delquadri (1994) extended the literature on using peer tutoring to increase reading performance of struggling students, who are typically developing, learning disabled, or autistic. Kamps et al. evaluated CWPT within an integrated classroom of three high functioning autistic students, six learning disabled students, and eight average students on reading fluency and reading comprehension for a three month period. The results showed a significant increase in oral reading rates and reading comprehension for all the students when compared to baseline measures.

Butler (1999) evaluated CWPT procedures with mild to moderately disabled children on the acquisition of sight words. His participants differed from most other CWPT studies in that all the students in the study were reading on approximately the same level. His results showed significant increases in sight word vocabulary for each student ($M=54.3$, Range 40-79) over an eight week period. He also showed that students who are on the same level of academic instruction could tutor one another and show favorable results. The Butler study also showed a favorable unexpected side effect. During periods of free time or study time, the students formed impromptu pairs for studying other subjects such as math and spelling. They worked together to solve problems and kept each other on task.

Despite the promise of peer tutoring, research evidence suggests that teachers may not consistently carry out their roles in the peer tutoring process with sufficient accuracy (Greenwood, Terry, Arreaga-Mayer, & Finney, 1992; Noell et al., 2000). Greenwood et al. conducted a clinical replication of CWPT to examine the level of natural treatment implementation of a CWPT for spelling. Five elementary teachers participated in this study to determine whether variations treatment strength (the number of CWPT sessions

done per week) and treatment implementation (accuracy to which the procedure was followed) would affect students' outcomes. The results showed that the teachers varied in the amount of treatment strength and implementation. As a result, the teachers who had poor treatment strength (conducted fewer than three CWPT sessions per week) and poor implementation (did not follow the procedures accurately) had students who made smaller gains in spelling accuracy.

Similarly, Noell et al. (2000) used a peer tutoring procedure to increase students' reading comprehension, while examining intervention implementation and two follow-up techniques. Five elementary school teachers participated in the study. Initially all five teachers varied in their amount of intervention implementation; however, all teachers fell to a zero level of implementation with the first two weeks of the intervention. Daily follow-up meetings with the teachers and providing the teachers with feedback regarding their performance helped to increase teacher intervention implementation.

One possible solution to the problem of treatment implementation is to have a consultant directly monitor the intervention. This process would eliminate the need for consultants to rely on consultees (teachers in this case) to deliver services to the intended target (students). One advantage to this model would be the ability to make adjustments to the intervention as needed. Regular inspection of the intervention data would allow the consultant to determine whether the intervention is appropriate and effective. This model removes the responsibility of intervention implementation from a teacher's schedule that is already inundated with numerous responsibilities. However, this type of model would place much greater demands on the consultant. The consultant would be responsible for planning the intervention, training the students to implement the intervention, actively

inspect the progress of the intervention, and making adjustments to the intervention when needed.

There is already some evidence to suggest that an independent peer tutoring procedure can be an effective intervention for students with academic needs. The five students in the Noell et al. (2000) study showed improvements in reading comprehension in spite of variable teacher implementation. Similarly, ninety percent of the students in the Greenwood et al. (1992) study showed gains in spelling accuracy. These findings suggest that peer tutoring is a robust procedure that can be effective even with variable intervention implementation. Also, there is some positive empirical evidence that students, once adequately trained, can implement peer tutoring procedures with high integrity. Dufrene, Noell, Gilbertson, and Duhon (2005) examined the treatment integrity of thirty-seven fourth grade students implementing a RPT intervention for math over thirty-two school days. Thirty-two of the students accurately implemented an average of 72.81% of daily RPT procedures ($R=44-91\%$) without additional instruction. Five of the students initially failed to implement the procedures with acceptable integrity following training; however, when those students received brief feedback regarding their performance, their implementation rates returned to acceptable levels.

Summary and Rationale

The purpose of this study was to incorporate the well established procedures of RPT and CWPT to develop an effective peer tutoring process that can be implemented with a minimum of teacher involvement. The students were responsible for initiating the tutoring sessions, collecting data, evaluating their performances, and administering

rewards based on achieving the goal for each session. A consultant monitored and evaluated the students' performance.

The procedures established were derived in part from those of Fantuzzo and colleagues and Greenwood and colleagues for reciprocal peer tutoring procedure to teach sight words to students referred for early reading problems. A basic sight word vocabulary is a list of words a reader recognizes without mediation (phonetic analysis) (Browder & Lalli, 1991). The target words for this study were obtained from the New Instant Word List compiled by Fry (1980). Half of all written English material is made up of the first one hundred words and the common variants that they form (variants are derived by adding –s or –ing to a word; Fry). The 300 New Instant Words, and their variants, make up 65% of all words in any writing sample in English (Fry). Thus it is his position that by teaching beginning readers these commonly occurring words, they are provided with a repertoire of words that would allow them to read half of the words printed in any common English writing, and provide a fast start toward developing reading fluency.

This study examined a reciprocal peer tutoring process that is appropriate for student dyads in which both members of the dyad were in need of remedial academic instruction in the area of reading. The study examined the extent to which the intervention was implemented as designed with minimal teacher involvement when the intervention was managed by an itinerant consultant. The students were trained to tutor each other based upon procedures derived from the RPT literature (Fantuzzo et al., 1984; Greenwood et al., 1983). The study examined the effectiveness of the reciprocal peer tutoring intervention on sight word acquisition. Also under investigation is the integrity

with which the intervention was implemented. Specifically, could those students who needed instruction on sight words tutor one another effectively, are there significant gains in sight word vocabulary, and will they implement the intervention at an acceptable rate with limited monitoring?

Method

Participants, Setting, and Screening

Ten elementary students, enrolled in East Baton Rouge public schools, participated in this study (Ned, Marge, Maggie, Lisa, Carl, Lenny, Peter, Lois, Meg and Chris). All ten students were in the second grade at the time of the study. Ned and Maggie were previously retained and were repeating the second grade. The students were referred by their teachers for poor sight word recognition and deficits in early reading. Once the students were determined eligible for the study, the students were grouped into dyads. Eligibility was determined by screening students' letter naming, letter sounds and sight word recognition. Those students who neither named letters nor produced correct letter sounds were excluded. Any students receiving remedial instructional services through the school, at the time of the study, were also excluded.

First, the students were assessed for letter naming fluency. Each letter of the alphabet, in both capital and lower case forms, was presented to the child on a 3" x 5" standard white index card. Each card was presented randomly to each student, and he/she was allowed three seconds to provide a correct response. After a correct response, incorrect response, or three seconds, the next letter was presented. Correct responses consisted of correctly naming the letter within three seconds. Correctly identified letters were sorted from incorrectly identified letters, and then recorded. The students received verbal praise for cooperating and attending to the task. Following the letter naming screening, students were screened for making common letter sounds. Each student was asked to make a common sound for each letter following the same general procedure as used for letter naming. All common sounds for each letter were accepted as correct.

Finally, the students were assessed on sight word recognition. Sight words obtained from the New Instant Word List (Fry, 1980), were presented to the students. Each word, printed in lower case letters, was presented on a standard 3”x 5” white index card. The students were assessed on the sight word recognition according to decreasing word frequency (Fry 1980). The students were allowed three seconds to give a correct response. After three seconds, a correct response, or an incorrect response, the next word was presented. Correctly identified words were sorted from incorrectly identified words and then recorded. This process continued until each student failed to identify a total of one-hundred sight words. The students received verbal praise for correct responding and attending to the task. A second screening was conducted with the unknown sight words. Those words that the student failed to identify correctly on both screening assessments formed the target word set for the study.

The data collected from the screening process determined eligibility for the study. Each student had to name all letters, identify a correct sound for at least 80% of the letters, and have a fund of at least 50 of the most common sight words that he/she did not know in order to participate.

Upon completion of the screening process, each student received a tangible reward for their participation and cooperation. Each student was allowed to choose a reward from a plastic “goodie” box that contained candy, pencils, stickers, small toys and hair accessories.

Training (described below) and daily tutoring session occurred in the school library for Lenny, Carl, Lisa, and Maggie and in an empty classroom for Ned, Marge, Peter, Lois, Meg and Chris. It was necessary to have a quiet environment, due to audio

tape recording that will be described later, equipped with a desk/table with room for two students. Based on the students' daily schedule and teacher approval, a time was selected for the tutoring sessions to occur each day. The tutoring sessions occurred once a day, and required 20-25 minutes to complete.

Teacher Interview and Student Pairings

After the screening and the students were determined eligible for the study, a brief interview was scheduled with the student's teacher. The interview consisted of reporting the screening findings to the teacher, establishing a time for the intervention to occur, identifying appropriate reinforcers for the students, and approving the student pairings. During one interview, Peter and Lois's teacher determined that this form of instruction was not appropriate them. She did not feel that these two students were capable of managing the intervention without direct supervision. As per her request, Peter and Lois were removed from the study, and provided an alternate, more supervised, intervention. Meg and Chris were also removed the study. Chris engaged in inappropriate behavior during the initial treatment sessions. His behavior became a disruption to other students and teachers, and as a result he and Meg were removed from the study. Meg and Chris were provided an alternate, more supervised, intervention similar to Peter and Lois.

After the teacher interview, the students were grouped into dyads. The students were grouped according to coinciding unknown sight words. Each group had a fund of fifty sight words identified as unknown for both students. The students were then introduced to one another, explained the purpose of the tutoring intervention, and explained what responsibilities they would have over the coming weeks.

Materials

An alarm clock, with daily settings functions, served as a daily prompt for the students. A standard minute timer was used to time each section of the session and to prompt movement to the next phase of the session. Two mini audiotape recorders/players were used each session. One recorder was used to record the daily session, and the other provided instruction and feedback to the students. Each recorder was a different color and clearly marked to ensure that each was used for only one purpose. Five separate tapes for each dyad were used in order to provide instruction and feedback. Each tape corresponded to a set of index cards that were used in each intervention session. The principal investigator created each audio tape recording, and each recording contained the series of events found in Table 1.

Five sets of 15 3”x 5” inch index cards, each with one sight word per side, printed in lower case letters, were used as the initial stimuli for the intervention for each group. Each card contained a sight word printed on both sides and each was individually numbered. The same 15 words were used in each of the five sets. The sets differed only in their order of arrangement. This insured that the students learned the words and not an order of presentation. The words chosen for the intervention were based on the sight word screening data. The initial set contained ten words that were not correctly identified by both of the referred students. The remaining five cards consisted of sight words that were correctly identified by both students. This is to ensure some success in responding when the intervention began. Each of the five target word sets were placed in separate plastic containers. Each container was marked with a specific color for each specific session. Along with the set of cards, the corresponding audiotapes were also in each

Table 1

Instructions for audiotape.

Instruction	Description
1. Board Setup.	Students were instructed to set up the playing board.
2. Deck Setup	Students were instructed to locate the appropriate card set for the session, and place them on the start square
3. Delay 1	Students were provided 30 seconds to locate card set
4. Timer setup	Students were instructed to set the timer for the appropriate time
5. Delay 2	Students were provided a thirty-second delay for locating the timer and setting the timer.
6. Beginning Prompt	Alerted the students that the session was about to begin
7. Delay 3	Five second delay for the students to prepare
8. Card Presentation	Tutoring student was instructed to present the first card
9. Delay 4	Three second delay to allow the tutee to respond
10. Pronunciation	A correct pronunciation of the presented word.
11. Repeat	Steps 8 through 10 were repeated until all cards in the set were presented
12. Restart	Tutoring student was instructed to return the card set to the starting position on the green square, and steps 6 through 11 are repeated until the timer sounds.

container. Each student was provided a folder that was designated only to be used for the intervention. Each folder contained word sheets that listed the students' target sight words. Each sheet was colored to match the corresponding word set, and the words were listed in the same order as presented on the corresponding instructional tape. Finally, a playing board was used in order to keep all the materials organized on the desk/table the students worked on during the session.

Dependent Measure: Definition, Measurement, and Interobserver Agreement

For both the baseline condition and the Reciprocal Peer Tutoring Condition, number of unknown sight words correctly identified by each student served as the dependent measure. All sessions were recorded which allowed for daily data collection. After each session, the experimenter listened to the tape recording for that session, and recorded all correct sight word identifications made by each student. A correct identification defined as: a correct pronunciation of the presented word made within three seconds after the word is presented. Words read correctly were scored for the first presentation of each word within the session only. Daily session sight word learning was defined as correct identification of a word on three consecutive tutoring sessions.

All audio recordings were examined by a second listener to establish Interobserver Agreement (IOA). IOA was calculated as the number of sight words both the experimenter and second observer recorded as identified correctly by the student, divided by the total possible agreements, and multiplied by 100%.

Twice per week, the principal investigator directly assessed the students' sight word recognition. The 15 index cards that the intervention began with served as the initial monitoring set. Once both students correctly identified a target word on two consecutive

direct assessments, the word was removed from the tutoring word set and replaced with another unknown sight word. All direct assessment sessions focused on the words the students were currently working on in their tutoring sessions. The tutoring audiotapes were adjusted each time word(s) were removed and new sight words were added.

Experimental Design

Design. A non-concurrent multiple baseline design was used to assess the effectiveness of the Reciprocal Peer Tutoring intervention. Comparison between the baseline condition and the treatment condition served as the basis for establishing the intervention's effectiveness.

Baseline. The baseline condition consisted of a no instruction/no treatment condition. One student (the tutor) presented the tutoring word set to the other student (the tutee) once. Each session was audio taped and the number of correctly identified unknown sight words was recorded. To assure the students implemented the procedures as designed the initial baseline sessions were supervised.

Reciprocal Peer Tutoring. Each session began with an initial presentation of the target words following the same procedures as used in baseline. The first presentation of the word list served as the daily session data.

Next, the students began the reciprocal tutoring process. The tutor presented the tutee with the word set in conjunction with a second audiotape (as described in Table 1) for a five-minute interval. The second audiotape provided the students with a model for correct word identification and permitted the tutor to provide accuracy feedback. The tutee followed along with a separate sheet of paper that contained the target sight words. The tutee circled any word he/she correctly identified. The tutoring student provided

feedback in the form of verbal praise to the tutee for correct responses. After five minutes, the students switched roles and repeated the procedure for another five-minute interval. Once the students completed both intervals, the students counted the number of circled words and wrote the number at the top of the page. This provided the students with consistent feedback on their progress.

Procedures

Once the students were grouped into dyads, the intervention was explained to them in the form of a game. The game required them to work together, and each student would take turns as the coach (tutor) and the player (tutee). If the students successfully completed the session for the day (complete all steps in the procedure), they placed a sticker on a special chart. The chart served as a monitor of the daily occurrence of the intervention. Upon completion of five sessions, the students were allowed to choose a reward from the principle investigator's reward box (small toy, candy, sticker, pens/pencils, and decorations).

Tutor Training. Student training occurred in two phases with the first being prior to baseline and the second prior to the Reciprocal Peer Tutoring condition. The pre-baseline training occurred over a period of two days, and continued until student's exhibited mastery on the target tasks. Mastery was defined as both students completing all training procedures without prompting. During pre-baseline the training sessions, the students learned to complete the tasks presented in Table 2.

Following the completion of baseline, the students began a second training using the Reciprocal Peer Tutoring procedures. Training occurred until the students met the mastery criteria. Mastery defined as completion of all training procedures by both

students without prompting. Maggie, Lisa, Lenny, and Carl required two training sessions to meet mastery, while Marge and Ned required three training sessions. RPT training incorporated a second audio tape recorder provided accuracy feedback during the treatment condition. During pre-treatment training, the students learned to incorporate the steps outlined in Table 3.

Table 2

Pre-baseline training procedure

Instruction	Description
1. Operate alarm.	Instructed students on how to operate the alarm for daily use.
2. Set up playing board	Students learned how to set up the playing board for daily tutoring sessions.
3. Recorder operation	Students learned how to operate the audio player/recorder that was used to record each session
4. Card presentation	Students learned how to present the target words

Procedural Integrity

Thirty percent of all intervention sessions were scored for the accuracy of implementation of the intervention. An integrity checklist (see Appendix A) was used to assess the extent to which the students correctly implemented the intervention procedures. Treatment integrity was measured as the number of procedures correctly completed for the session, divided by the total number of procedures for the session, and then multiplied by 100% The students were intentionally not provided feedback regarding their performance. This was done to obtain a more accurate representation of procedural integrity of an intervention that was maintained by an itinerant consultant.

Table 3

Reciprocal peer tutoring training procedure

Instruction	Description
1. Operate second audio player/recorder.	Students learned how to operate and follow along with the second audio player/recorder.
2. Timer operation	Students learned how to set the timer for the tutoring session.
3. Data recording	Students learned how to record the words that were correctly identified during tutoring.
4. Praise/feedback	Students learned how to give feedback and praise when in the role of tutor.
5. Rewards	Students learned how to self-administer rewards.

Results

Screening

Prior to inclusion, all students were screened for letter naming fluency, letter sounds, and sight word recognition. All students were able to correctly identify all letters, both capital and lower case, and produce common letter sounds for all letters. The unknown words from the sight word screening were used to make the target word set for each student.

Implementation, Sight Word Acquisition, and Interobserver Agreement

For each tutoring group, sight words acquisition was measured for each individual student and as a group. During baseline, individual acquisition was defined as a correct pronunciation of the target word within three seconds of presentation for any session. This ensured that the sight words previously determined as unknown during screening had not been acquired by the students prior to the treatment phase. For the treatment phase, individual acquisition was defined as a correct pronunciation of the target word within three seconds of presentation for three consecutive sessions. Scoring occurred only for the first presentation of the target word within the session. Also, each student was directly assessed for sight word acquisition (approximately every three days). This was to control for the possible confound of inflated sight word acquisition based on which student tutored first. Also, this measure served as the criterion to determine if a target word was learned and should be replaced by a new unknown word. When both students in each group correctly identified a target word on two consecutive direct assessments, the word was removed and replaced with a new unknown word.

Each student's daily session tape was examined by the principal investigator and a second independent observer. This was to determine daily implementation of the tutoring session and to establish Interobserver Agreement (IOA) for each student's daily session. IOA was calculated as the number of target words both the investigator and second observer recorded as identified correctly by the student, divided by the total possible agreements, and multiplied by 100%

Group one consisted of Marge and Ned. Marge and Ned independently implemented eighteen of a possible twenty sessions (90.0%). Both omitted sessions occurred during the treatment phase. Session fifteen was not implemented due to an unscheduled school event, and session nineteen was not implemented due to Ned's absence on that day. Group two consisted of Maggie and Lisa. Of the twenty possible sessions, Maggie and Lisa independently implemented eighteen of the sessions (90.0%). Both sessions omitted occurred during the treatment phase. Sessions seven and seventeen were both omitted due to Maggie's absence on those days. Group three consisted of Lenny and Carl. Of the twenty possible sessions, Lenny and Carl independently implemented eighteen of the twenty sessions. Both sessions omitted occurred during the treatment phase. Session fifteen and session sixteen were omitted due to Lenny's absence on those days.

Figure 3 displays the total number of new sight words acquired individually by each student and as a group. Figure 3 represents the non-concurrent multiple baseline design across each group of students. As figure 3 portrays, none of the six students

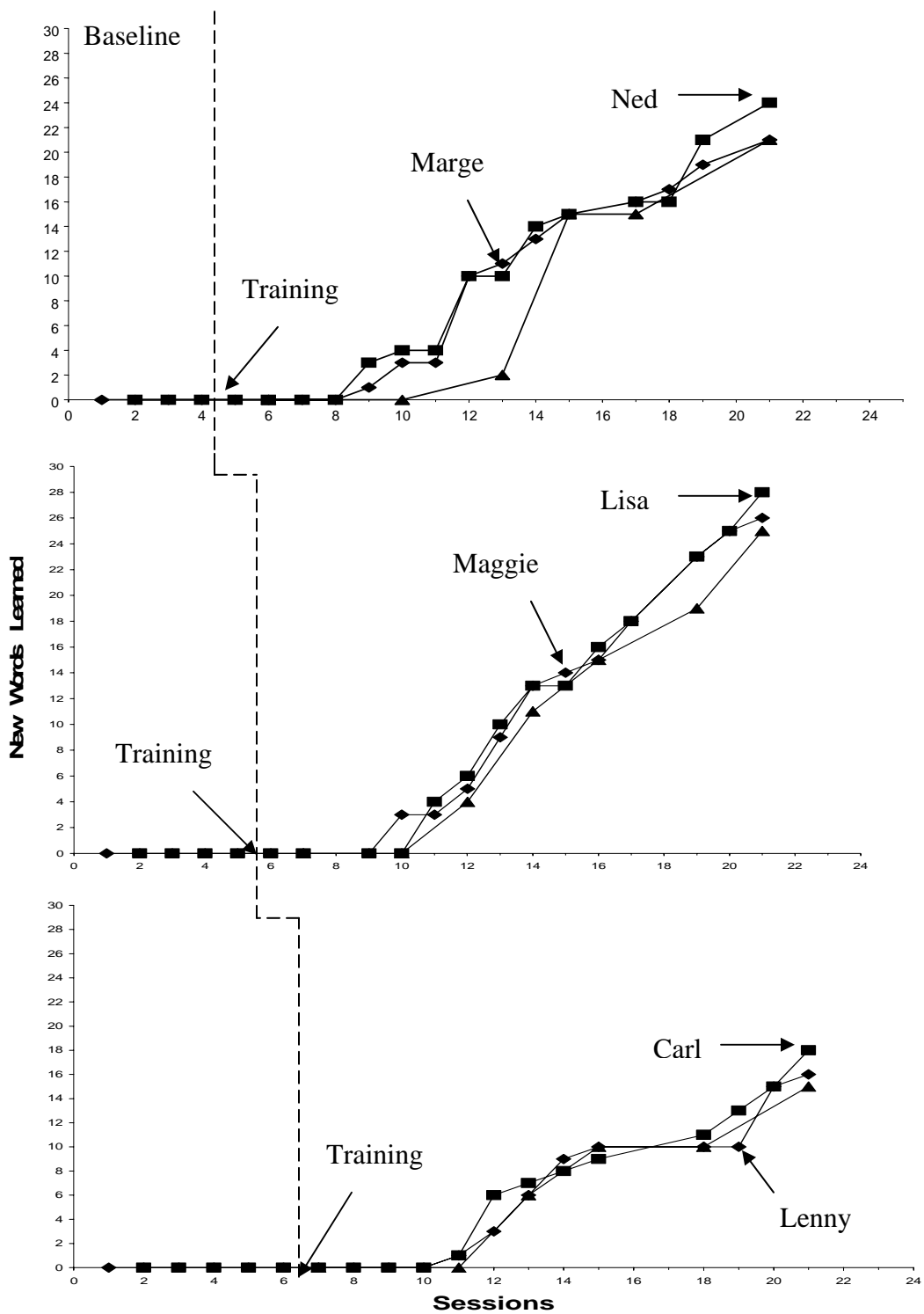


Figure 1 Squares and Diamonds represent the number of sight words acquired during Daily Sessions. Triangles represent words acquired based upon to direct assessments.

correctly identified any of the previously determined unknown sight words prior to the treatment phase. Marge acquired a total of twenty-one new sight words over sixteen treatment sessions. This total is also consistent with the data found through direct assessment. IOA over the twenty sessions for Marge was 97.33% ($R= 73.33-100\%$). Ned's daily sessions showed that he learned a total of twenty-four new sight words. However, direct assessment data showed that Ned only learned twenty-one words. These twenty-one words were identical to the twenty-one Marge acquired. IOA for Ned of the twenty sessions was 100%. Overall the students acquired new sight words at a rate of 1.31 words per session post-baseline. The discrepancy between Ned's daily session sight word acquisition and direct assessment sight word acquisition may be attributable to the fact that he predominately tutored first. Because Ned predominately tutored first, he was exposed to the target words more often than Marge prior to his turn as the tutee.

Maggie's daily sessions showed that she learned a total of twenty-six new sight words. This total is also consistent with the data found through direct assessments. IOA over the twenty sessions for Maggie was 97.78% ($R= 93.33-100\%$). Lisa's daily sessions showed that she learned a total of twenty-eight new sight words; however, direct assessment data showed that Lisa acquired only twenty-six new sight words. These twenty-six words were identical to the twenty-six words Maggie acquired. IOA for Lisa for the twenty sessions was 99.11% ($R= 93.33-100\%$). Overall the students acquired new sight words at a rate of 1.73 words per session post baseline. Similar to Ned, the discrepancy between Lisa's daily session sight word acquisition and direct assessment data may be attributable to the fact that she predominately tutored first. Ned and Lisa's discrepancies will be addressed in more detail in the discussion.

Lenny's daily sessions showed that he learned a total of sixteen new sight words; however, the direct assessments showed that Lenny only acquired fifteen new sight words. IOA for Lenny for the twenty sessions was 97.78% ($R= 86.67-100\%$). Similarly, Carl's daily sessions showed that he learned a total of eighteen new words, while direct assessments showed that he only acquired fifteen new words. IOA for Carl for the twenty sessions was 98.67% ($R= 86.67-100\%$). The fifteen words acquired by Lenny and Carl were identical. Overall, Lenny and Carl acquired new sight words at a rate of 1.07 words per session post baseline. Lenny and Carl's discrepancy between daily sessions and investigator assessments were a result of Lenny's absences. New unknown words were introduced after session fourteen; consequently, the new words were a part of four daily sessions but were only directly assessed on one occasion. This enabled Lenny and Carl to meet criteria on the new words according to daily session criteria, but not by direct assessment criteria.

Procedural Integrity

Each group was evaluated on how accurately they implemented the various steps of the peer tutoring intervention. A total of six sessions (30%) for each group were directly observed. Checklists containing all intervention procedures were used to evaluate procedural integrity (see Appendix A). Procedural Integrity was calculated as the number of procedural steps correctly implemented divided by the total number of procedures possible and then multiplied by 100%, while 30% of sessions were evaluated for Procedural Integrity, all sessions observed occurred during the treatment phase of the peer tutoring intervention (twice per week each school week.).

Table 4

Reciprocal peer tutoring procedural integrity steps

Category	Procedure
Setup	<p>Used playing board.</p> <p>Placed tape player/recorder in correct spot</p> <p>Pressed play on correct tape player</p> <p>Correctly set timer for five minutes</p> <p>Placed word cards on start square.</p> <p>Used the correct score sheet</p> <p>Pressed record on the recorder</p> <p>Used the correct tapes in the correct recorders</p>
Tutoring	<p>Tutor presented correct word card</p> <p>Tutor provided praise when applicable</p> <p>Tutor placed word card on stop square after presentation</p> <p>Tutor accurately returned word deck to the start square when all words were presented</p> <p>Tutee correctly scored their response to each word card</p>
Pick-up	<p>rewind instructional tape</p> <p>Correctly recorded score at the top of the score sheet</p> <p>Returned score sheets to individual folders</p> <p>Returned tapes and word cards to the correct bag</p> <p>Returned all materials to organizational cabinet</p> <p>Placed stickers on chart</p>

Procedural integrity was recorded on the first day of treatment for each group, and both members were required to score 100% on all intervention procedures without any prompting. This was to ensure that each group was adequately trained. All groups demonstrated 100% integrity and no additional training was required.

The intervention procedures were divided into three main categories: Setup, Tutoring, and Pick-up. Setup consisted of eight procedures, Tutoring consisted of five procedures and Pick-up consisted of six procedures (see Table 4). Across the six Procedural Integrity observations, Ned accurately implemented 100% of all Setup procedures, and Marge accurately implemented 95.83% ($R= 87.50-100\%$) of all Setup procedures (see Table 5). For Tutoring procedures, Ned accurately implemented 92.19% ($R=84.50-100\%$) of all procedures, and Marge accurately implemented 84.42% ($R= 66.42-100\%$) of all procedures (see Table 6). For Pick-up procedures, Ned accurately implemented 100% off all procedures, and Marge accurately implemented 97.22% ($R=83.33-100\%$) of all procedures (see Table 6).

Both Group two members, Maggie and Lisa, accurately implemented 100% of all Setup procedures (see Table 7). For Tutoring Maggie accurately implemented 99.52% ($R= 98.57-100\%$) of all procedures, and Lisa accurately implemented 96.98% ($R= 91.36-100\%$) of all procedures (see Table 8). For Pick-up, both Maggie and Lisa accurately implemented 100% of all procedures (see Table 8).

Table 5

Procedural integrity results for Ned and Marge-setup

Student	Category	Procedure	Percentage	Range		
Ned	Setup	Used playing board	100%	—		
		recorders in correct spot	100%	—		
		Pressed play on instructional tape	100%	—		
		Set timer correctly	100%	—		
		Cards on start	100%	—		
		Correct score sheet	100%	—		
		Pressed record	100%	—		
		Correct tapes in	100%	—		
		Correct recorders	100%	—		
		Total setup procedural Integrity	100%	—		
		Marge	Setup	Used playing board	100%	—
				recorders in correct spot	100%	—
				Pressed play on instructional tape	100%	—
				Set timer correctly	100%	—
Cards on start	100%			—		
Correct score sheet	100%			—		
Pressed record	83.33%			0-100%		
Correct tapes in	83.33%			0-100%		
Correct recorders	83.33%			0-100%		
Total setup procedural integrity	95.83%			87.50-100%		

Table 6

Procedural integrity results for Ned and Marge-tutoring and pick-up

Student	Category	Procedure	Percentage	Range
Ned	Tutoring	Presented correct word card	86.22%	57.23-100%
		Provided praise when applicable	89.43%	64.28-100%
		Placed card on stop square	97.25%	92.86-100%
		Returned deck to start square	100%	—
		Correct scoring	98.88%	93.33-100%
		Overall procedural integrity-tutoring	92.19%	84.50-100%
		Marge	Tutoring	Presented correct word card
Provided praise when applicable	87.34%			64.71-100%
Placed card on stop square	81.17%			60.47-100%
Returned deck to start square	77.78%			0-100%
Correct scoring	100%			—
Overall procedural integrity-tutoring	84.42%			66.42-100%
Ned	Pick-up			Rewind tape correctly recorded
		score	100%	—
		Returned scored sheet to folder	100%	—
		returned tapes and cards to appropriate bag	100%	—
		returned all materials to organizational container	100%	—
		Overall procedural Integrity-pick-up	100%	—
		Marge	Pick-up	Rewind tape correctly recorded
score	83.33%			0-100%
Returned scored sheet to folder	100%			—
returned tapes and cards to appropriate bag	100%			—
returned all materials to organizational container	100%			—
Overall procedural Integrity-pick-up	97.22%			83.33-100%

Both Group three members, Lenny and Carl accurately implemented 97.91% ($R=87.50-100\%$) of all Setup procedures (see Table 9). For Tutoring procedures, Lenny accurately implemented 98.23% ($R= 94.78-100\%$) of all procedures, and Carl accurately implemented 83.50% ($R=69.66-100\%$) of all procedures. For Pick-up procedures, Lenny accurately implemented 100% of all Pick-up procedures, and Carl accurately implemented 97.22 ($R= 83.33-100$) of all Pick-up procedures (see Table 10).

Table 7

Procedural integrity results for Maggie and Lisa-setup

Student	Category	Procedure	Percentage	Range		
Maggie	Setup	Used playing board	100%	—		
		recorders in correct spot	100%	—		
		Pressed play on instructional tape	100%	—		
		Set timer correctly	100%	—		
		Cards on start	100%	—		
		Correct score sheet	100%	—		
		Pressed record	100%	—		
		Correct tapes in				
		Correct recorders	100%	—		
		Total setup procedural Integrity	100%	—		
		Lisa	Setup	Used playing board	100%	—
				recorders in correct spot	100%	—
				Pressed play on instructional tape	100%	—
Set timer correctly	100%			—		
Cards on start	100%			—		
Correct score sheet	100%			—		
Pressed record	100%			—		
Correct tapes in						
Correct recorders	100%			—		
Total setup procedural integrity	100%			—		

Table 8

Procedural integrity results for Maggie and Lisa-tutoring and pick-up

Student	Category	Procedure	Percentage	Range		
Maggie	Tutoring	Presented correct word card	100%	—		
		Provided praise when applicable	98.23%	95.12-100%		
		Placed card on stop square	99.20%	92.86-100%		
		Returned deck to start square	100%	—		
		Correct scoring	100%	—		
		Overall procedural integrity-tutoring	99.52%	98.57-100%		
		Lisa	Tutoring	Presented correct word card	99.20%	95.12-100%
				Provided praise when applicable	89.65%	74.35-100%
Placed card on stop square	97.21%			95.12-100%		
Returned deck to start square	94.44%			66.67-100%		
Correct scoring	92.22%			73.33-100%		
Overall procedural integrity-tutoring	96.98%			91.36-100%		
Maggie	Pick-up			Rewind tape correctly recorded	100%	—
				score	100%	—
		Returned scored sheet to folder	100%	—		
		returned tapes and cards to appropriate bag	100%	—		
		returned all materials to organizational container	100%	—		
		Overall procedural Integrity-pick-up	100%	—		
		Lisa	Pick-up	Rewind tape correctly recorded	100%	—
				score	100%	—
Returned scored sheet to folder	100%			—		
returned tapes and cards to appropriate bag	100%			—		
returned all materials to organizational container	100%			—		
Overall procedural Integrity-pick-up	100%			—		

Table 9

Procedural integrity results for Lenny and Carl-setup

Student	Category	Procedure	Percentage	Range		
Lenny	Setup	Used playing board	100%	—		
		recorders in correct spot	100%	—		
		Pressed play on instructional tape	100%	—		
		Set timer correctly	100%	—		
		Cards on start	100%	—		
		Correct score sheet	100%	—		
		Pressed record	100%	—		
		Correct tapes in				
		Correct recorders	83.33	0-100%		
		Total setup procedural Integrity	97.91%	87.50-100%		
		Carl	Setup	Used playing board	100%	—
				recorders in correct spot	100%	—
				Pressed play on instructional tape	100%	—
Set timer correctly	100%			—		
Cards on start	100%			—		
Correct score sheet	100%			—		
Pressed record	100%			—		
Correct tapes in						
Correct recorders	83.33%			0-100%		
Total setup procedural integrity	97.91%			87.50-100%		

Table 10

Procedural integrity results for Lenny and Carl-tutoring and pick-up

Student	Category	Procedure	Percentage	Range		
Lenny	Tutoring	Presented correct word card	98.82%	95.34-100%		
		Provided praise when applicable	96.07%	84.37-100%		
		Placed card on stop square	98.82%	95.34-100%		
		Returned deck to start square	100%	—		
		Correct scoring	100%	—		
		Overall procedural integrity-tutoring	98.23%	94.78-100%		
		Carl	Tutoring	Presented correct word card	82.75%	69.77-100%
				Provided praise when applicable	82.17%	65.83-100%
Placed card on stop square	80.78%			69.77-100%		
Returned deck to start square	77.78%			33.33-100%		
Correct scoring	97.78%			93.33-100%		
Overall procedural integrity-tutoring	83.50%			69.66-100%		
Lenny	Pick-up			Rewind tape correctly recorded	100%	—
				score	100%	—
		Returned scored sheet to folder	100%	—		
		returned tapes and cards to appropriate bag	100%	—		
		returned all materials to organizational container	100%	—		
		Overall procedural Integrity-pick-up	100%	—		
		Carl	Pick-up	Rewind tape correctly recorded	100%	—
				score	83.33%	0-100%
Returned scored sheet to folder	100%			—		
returned tapes and cards to appropriate bag	100%			—		
returned all materials to organizational container	100%			—		
Overall procedural Integrity-pick-up	97.22%			83.33-100%		

Discussion

The results of this study demonstrate that two students in need of remedial instruction in the area of reading can accurately and effectively tutor one another. Each student in the three dyads made significant gains in their sight word vocabulary. These findings parallel to those reported by Butler, (1999) where he was able to significantly increase the sight word vocabulary of mild to moderately mentally disabled students, who were all functioning at the same reading level, using Classwide Peer Tutoring procedures. This finding is not unexpected given the success Reciprocal Peer Tutoring and other peer mediated interventions have already demonstrated. However, it is significant that two students, both in need of instruction, will consistently implement a designed intervention, with acceptable integrity, and do so with limited supervision.

All three dyads implemented 90% of all possible tutoring sessions (18 of 20). For Lenny and Carl, Maggie and Lisa the missed sessions were a result of absences. This was the same for one of Ned and Marge's sessions, but an unscheduled school event prevented the other session from occurring. Given the past research regarding teacher treatment integrity, the results of this study are particularly encouraging. Noell et al. (1997) and Witt et al. (1997) showed that teachers often fail to implement prescribed interventions with accuracy and integrity, and recent follow-up studies showed an improvement in teacher integrity when the teachers were provided with feedback regarding their performance (Noell, Witt, Slider, Connell, Gatti, Williams, Koeing, Resetar, & Duhon, 2005; Noell, Duhon, Gatti, & Connell, 2002). Interestingly, the students in this study demonstrated equal to or higher procedural integrity than the

teachers in the follow-up studies, and did so with out feedback regarding their performance or need for teacher involvement.

The findings of this study compliment those found by Dufrene et al (2005). Thirty-two of thirty seven students, over thirty-two days, were able to implement a RPT math intervention with acceptable integrity. Similarly, the students in this study demonstrated acceptable integrity with a RPT intervention for sight words, in which the treatment phase ranged from eighteen (Lenny and Carl) to thirty-five (Maggie and Lisa) calendar days. The treatment phase varied for each group due to annual standardized testing and holidays. Interestingly, Maggie and Lisa, who had the best overall procedural integrity, had the most interruptions during their treatment phase.

For the observed sessions, all three dyads implemented the intervention procedures for each section (Setup, Tutoring, and Pick-up) with high integrity. Maggie, Lisa, and Ned implemented 100% of all Setup Procedures. Lenny, Carl, and Marge implemented 97.91%, 97.91% and 95.83% of Setup procedures respectively, and none fell below 87.50% implementation. Interestingly, the most commonly missed procedure was using the correct tapes in the correct tape recorder (once each for Lenny, Carl, and Marge). This was the only Setup procedure that was not prompted by the instructional tape. The other procedure missed was pressing record on the recorder. Marge omitted this step on one observation. It is possible that the high integrity rates for the Setup procedures were a result of the prompting by the instructional tape; however, it was observed that once the students became familiar with the Setup procedures they began to setup for the session first and then use the instructional tape as a method of double checking themselves.

The students also implemented the Pick-up procedures with high integrity. Maggie, Lisa, Lenny, and Ned all implemented 100% of Pick-up procedures. Carl and Marge both implemented 97.22% of all Pick-up procedures, and neither fell below 83.33% implementation. Both Marge and Carl failed to record their score on one occasion.

Most breakdowns in procedural integrity occurred during the Tutoring section of the intervention. Overall, Maggie and Lisa were most successful in implementing the Tutoring procedures. Maggie and Lisa implemented 98.57% and 96.98% of all Tutoring procedures respectively. Maggie was highly accurate implementing all procedures at 95% or higher; however, Lisa experienced some difficulties with providing praise and scoring. Frequently, near the end of the session, Lisa would stare at the timer and announce the time as it neared zero instead of providing praise to Maggie's correct responses. Lisa's difficulties with scoring will be addressed later. Lenny and Carl were the second most accurate in implementing the Tutoring procedures. Overall, Lenny and Carl implemented 98.23% and 83.50% of all tutoring procedures respectively. With one exception, Lenny implemented all Tutoring procedures at 95% or higher; however, Carl did experience several difficulties trying to implement the tutoring procedures. Carl frequently would place the cards in an incorrect order after presentation, or would have problems returning the cards from the stop square to the start square. This led to Carl mixing the cards into an incorrect order. As a result, he would spend extended periods of time trying to correct the mistake. This caused Carl to miss several procedures and greatly reduced his procedural integrity. Ned and Marge had the poorest procedural integrity of the three dyads. Ned and Marge implemented 92.19% and 84.42% of all Tutoring procedures

respectively. Ned experienced difficulties presenting the card and providing praise. Like Lisa, Ned often would stare at the timer towards the end of the session, and announce the time as it neared zero. As a result, he missed several opportunities to provide praise to Marge's correct responses. Ned's card presentation will be addressed later. Marge also experienced several difficulties with the procedures. Like Carl, Marge often mixed the order of the cards by placing them out of order on the stop square after presentation. Like Carl, this resulted in her spending extended amounts of time trying to organize the cards. Consequently, she missed several procedures and this greatly reduced her procedural integrity.

Despite the students' increase in sight word vocabulary and the accuracy with which the students implemented the intervention procedures, there were some unwanted side effects of the study. Maggie and Lisa became highly competitive over the course of the study. Because of the design of the intervention, the student who tutored first would more likely have a higher daily score than the student who was the tutee first. As a result, the students bickered over who would tutor first. This was evident during observations and during analysis of the daily recorded sessions. This competition also led to Lisa's lower procedural integrity rates for scoring. She frequently attempted to score incorrect words as correct in order to ensure a higher score than Maggie. This naturally led to more bickering. Typically Maggie submitted to Lisa and allowed her to tutor first. This disproportionate arrangement is most likely what caused Lisa's discrepancy between her daily session data and directly assessed data. Ned and Marge experienced some of the same problems. Ned frequently would deny Marge's requests to be the tutor first. However, Marge typically allowed Ned to tutor first without any argument. Like Lisa,

this disproportionate arrangement is most likely what caused Ned's discrepancy between his daily session data and directly assessed data.

Limitations and Directions for Future Research

One limitation of this study is the design of the RPT procedures. As designed the progress of the dyad is contingent upon the progress of the slowest moving member. A word was removed only after both students correctly identified the word on two consecutive direct assessments. If the students acquire words at different rate, this slows the overall learning potential for the faster moving student. In addition, this can cause the faster moving student to become bored with the intervention and possible lead to poorer procedural integrity and/or behavior problems. A related problem occurred during the course of this study. Maggie and Lisa, and Lenny and Carl were acquiring the same words at the same rate. Meaning both members of the groups were correctly identifying the same words during the direct assessments. Only once did one student meet criteria for a word to be removed before the other student. This was not the case for Ned and Marge. While Ned and Marge were acquiring the same quantity of words, they were not acquiring the same words. As a result, Ned and Marge spent more sessions working with words they had mastered. This can be seen in Figure 1. Maggie and Lisa's direct assessment data and Lenny and Carl's direct assessment data progresses along with their daily session data; however, Ned and Marge's assessment data is marked with periods of no movement followed by large increases in acquisition. The repetitiveness of working with the same words for an extended period of time is what affected Ned's card presentation integrity. It became obvious that Ned was bored with working the same words, and he began to present the words at a faster rate than the instructional tape

prompted. Future research should control for different learning rates, and allow for individual growth.

Another limitation of this current design is that the length of the tutoring session, the number of words in the target word set, and the criteria for sight word acquisition were arbitrarily chosen. As a result, the students frequently became disinterested with the intervention near the end of the daily session. The loss of interest can most likely be attributed to the session time being too long, too small target word sets, prolonged sessions with the same target words, or a combination of the three. Optimally, the session length and target word sets would be tailored to suit the needs of each student; however, RPT involves two students working together and individualization in this manner may not be possible. Future research should consider a more validated approach to determining session length and target word sets. Also, a less restrictive criterion for sight word acquisition should be considered. Requiring two correct identifications on consecutive direct assessments for replacement may have been too stringent. This resulted in some words remaining in the tutoring word set long after the student acquired the word, but had yet to meet criteria for replacement. A more appropriate criterion may be to require three correct identifications on consecutive daily sessions, and one correct identification on a direct assessment. This may prevent words from remaining in the target word set for an unnecessary amount of time, and help promote more overall sight word acquisition by increasing the exposure to more unknown words.

Future research designs should attempt to simplify the efforts needed to prepare and maintain the intervention. The time required to develop and update the instructional tapes make this intervention highly unpractical for use in school settings. One option is to

eliminate the Setup procedures from the instructional tape. As noted earlier, the students quickly mastered the Setup procedures and were able to setup the intervention without the need of instruction. Also, the students demonstrated high procedural integrity with the Pick-up procedures none of which were prompted by the instructional tape. Eliminating the known sight words is another option to help simplify the preparation. Known sight words were used in the initial target word sets for each dyad to ensure some success during the beginning treatment sessions. However, most of the students were correctly identifying unknown sight words by the second treatment session. Another option would be to require the students master all the target words in a set before moving to the next set of words. This would reduce the amount of time needed to update the intervention. However, this option would increase the probability of the students becoming disinterested in the intervention, and most likely lead to behavior problems and/or breakdowns in procedural integrity.

Browder and Xin (1998) point out that the most common criticism of teaching sight words in isolation is that the acquisition of words does not generalize to written text. By teaching sight words in isolation, students become “word callers” instead of readers. This study failed to address this issue by examining whether the target words determined acquired by the students generalized to written text. Future studies should incorporate a measure of reading fluency containing the sight words targeted in the intervention. A reading fluency measure would satisfy the concerns addressed by Browder and Xin, and further demonstrate the effectiveness teaching sight words in order to improve reading skills.

Unfortunately, four of the original ten students were removed from the study. Peter and Lois were considered too immature by their teacher to participate. The teacher believed that these students did not possess the organizational skills necessary for them to accurately implement the tutoring procedures. This suggests the likelihood that many teachers may not find this type of intervention acceptable, because of the responsibilities required by the student. Also, Chris and Meg had to be removed from the study, due to Chris's behavior problems. This was not unexpected since many students may not function well in an unsupervised environment. The attrition of these students demonstrate that an independent reciprocal peer tutoring intervention may be acceptable for some students but not for all.

The effectiveness of Reciprocal Peer Tutoring as a teaching technique has long been established. However, RPT has predominately been used mainly in the area of mathematics. This is most likely due to the need to have a method of providing corrective feedback, and mathematics easily lends itself to RPT. This study extended the use of RPT to the area of reading, and provided a method of providing feedback. Using an audio-tape player and a constant time delay procedure for presentation, two students were able to teach one another. Future studies, focused on academic intervention, should look to take advantage of the effectiveness of RPT by expanding it use in other academic areas.

In summary, the current study demonstrated that two students in need remedial instruction in reading can accurately and effectively tutor one another. This study further validates Reciprocal Peer Tutoring and other peer mediated interventions as effective treatments for students in need of supplemental academic assistance. Given the past findings regarding teacher treatment integrity (Greenwood et al., 1992; Noell et al., 2000;

Noell et al., 1997; & Witt et al., 1997), fact that the students were able to tutor one another accurately and effectively with no teacher involvement and minimal consultant supervision demonstrates the need for further examination of students as primary delivery agents for academic interventions. Future to studies should look to develop methods to increase the use of RPT and other peer mediated interventions within school settings, and to increase the roles and responsibilities students have in these interventions.

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