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The effect of peer assisted learning strategies on reading fluency

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THE EFFECT OF PEER ASSISTED LEARNING STRATEGIES ON
READING FLUENCY

Thesis

Submitted to

The School of Education & Allied Professions of the
UNIVERSITY OF DAYTON

in Partial Fulfillment of the Requirements for

The Degree

Educational Specialist in School Psychology

by

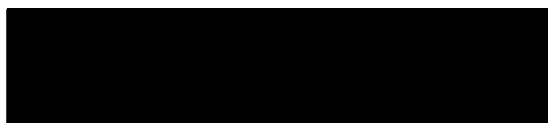
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Abstract

THE EFFECT OF PEER ASSISTED LEARNING STRATEGIES ON READING FLUENCY

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Peer Assisted Learning Strategies-Reading (PALS) was implemented in Grades 4, 5, and 6 of four suburban elementary schools and one middle school to determine its effect on oral reading fluency (ORF) as assessed by curriculum-based measures of reading (CBM). The results indicated that this structured, peer-mediated instructional method increased the oral reading fluency for the students receiving PALS to a degree that was significantly higher compared to the control group. A significant difference was also seen between Grade 4 and Grade 5 oral reading fluency scores, with Grade 4 achieving higher scores.

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Introduction

Peer Assisted Learning Strategies (PALS) is a peer-mediated instructional strategy that is used as an adjunct to supplement regular classroom instruction. Its key features include frequent peer-interaction to provide immediate feedback, role reciprocity, and structured activities (Fuchs, Fuchs, & Burish, 2000), thus assisting teachers to accommodate academic diversity, and increase academic involvement of children (<http://kc.vanderbilt.edu/kennedy/pals/>). Given that PALS makes less demands on the teacher's instructional time, there is optimum learning even when the teacher is not implementing direct instruction. PALS is economical with reference to time and when used with Curriculum-Based Measurement (CBM) to measure reading fluency. Hence, as an efficient and manageable way to evaluate the instructional process and monitor progress, PALS has implications not only for school teachers, but also for policy makers and program evaluators in making decisions about program implementation (Buly & Valencia, 2002).

The purpose of this study is to determine the effect of PALS using CBM as a progress monitoring technique to examine reading fluency gains of students in Grades 4, 5, and 6. This study also compares performance of students with and without disabilities, and further investigates performance of students with disabilities in the inclusion setting relative to students with disabilities in the resource room setting.

CHAPTER 1

Literature Review

Peer tutoring can be traced back to the 18th century when two British educators developed and implemented this technique (Fuchs, Fuchs, Mathes, & Simmons, 1997). Peer tutoring was dormant for a while until it was rejuvenated by American educators in the 1960s. There has been a large quantity of research in empirically validating various peer tutoring programs. which has led to different forms of peer tutoring. Peer Assisted Learning Strategies (PALS) is one such program that is based on principles drawn from two well-researched instructional programs, Classwide Peer Tutoring (CWPT) (Delquadri, Greenwood, Stretton, & Hall, 1983) and Cooperative Integrated Reading and Composition (CIRC) (Stevens, Madden, Slavin, & Farnish, 1987).

Class-wide Peer Tutoring (CWPT)

One category of peer tutoring that has shown to be very effective is Classwide Peer Tutoring (CWPT). Classwide Peer Tutoring was developed by researchers at the Juniper Gardens Research Project in collaboration with regular classroom teachers in response to the observed low level of academic engagement among students from low socioeconomic strata, leading to low academic achievement. Class-wide Peer Tutoring is based on three principles of 'opportunity to respond', 'functionality of key academic skills', and 'behavioral procedures' (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986).

A study by Delquadri et al. (1983) focused on the concept of the "opportunity to respond" defining it as the use of instructional tactics that involve 'presenting', 'questioning', and 'correcting', so that all students in the classroom made desired responses. It has been observed that classrooms differ with reference to the "opportunity to respond" provided to students. A teacher may or may not have the time to academically engage every student to ensure that all students respond to the instructional materials. Class-wide Peer Tutoring is an instructional procedure in which students interact with one another as a tutor and tutee in a session and provide peer support (King, 1995). Class-wide Peer Tutoring ensures that students are academically engaged, and receive adequate opportunities to respond, thus improving academic performance using the available instructional material. The second principle, functionality of key academic skill areas, encourages teachers to select an academic skill that is measurable (e.g., the number of spellings correct, the number of sentences read correctly). The third principle of applying behavioral principles uses positive reinforcement by awarding points for completing a required task without errors. For example, points are awarded if a student reads a sentence without errors. These points are accumulated to form a team score that determines the winning team from the two teams. The entire class applauds the winning team (Delquadri et al., 1986).

The first longitudinal study (Greenwood, Delquadri, & Hall, 1989) conducted over a 4-year period to study CWPT in children of lower socio-economic status clearly indicated its long-term effectiveness. In this study, CWPT

was implemented with students in Grade 1 who continued to receive CWPT through Grade 4. The performance of students receiving CWPT was compared with students receiving regular instruction without CWPT. Results from the Metropolitan Achievement Test indicated greater gains for the CWPT group than for the control group. Greenwood, Terry, Utley, Montagna, and Walker (1993) conducted a follow-up study after 2 years, with the same students who were now in the sixth grade. This time the Comprehensive Test of Basic Skills (CTBS-U) indicated that the students who had received CWPT maintained their gains compared to students in the control group. Another interesting finding of this study was that the students who received CWPT were referred for special education services less frequently compared to the students in the control group in the low SES schools. A meta-analytic study conducted by Rohrbeck, Ginsburg-Block, Fantuzzo, and Miller (2003) to investigate the effectiveness of various types of peer-assisted learning interventions conferred their effectiveness, particularly with low income, minority students.

Cooperative Integrated Reading and Composition (CIRC)

The Cooperative Integrated Reading and Composition (CIRC) program was developed during 1986-88 at the John Hopkins University. It is a comprehensive approach to instruction in reading comprehension and writing skills for Grades 2-6 (Stevens et al., 1987). The teacher begins with presenting new skills using direct instruction, followed by cooperative group activities. Students are taught in reading groups of 4 to 6 students and they work on a series of cooperative activities including partner reading. In partner reading

students take turns in reading aloud. Halfway through the story, students identify characters, setting, and the problem, and predict how the problem might be resolved. At the end of the story, they retell the story in their own words (Story Retell). In addition to the reading fluency and reading comprehension component, students communicate what they have read through a writing exercise (Stevens et al., 1987).

Few but strong studies have indicated the effectiveness of CIRC. Students who received CIRC instruction achieved significantly higher scores on the reading comprehension, reading vocabulary, language expression, and spelling sub-tests of the California Achievement Test as compared with a control group (Stevens et al., 1987). This study compared the performance of 635 students in Grades 2-6 who received CIRC instruction with the performance of 644 students in the control group. The students in the CIRC instruction group achieved significantly higher scores in reading vocabulary and reading comprehension areas of the California Achievement Test compared to students in the control group. In another longitudinal study (Stevens & Slavin, 1995), students with learning disabilities who received CIRC instruction scored significantly higher on the reading vocabulary, reading comprehension, and language expression tests of the California Achievement Test at the end of 2 years.

In a research report compiled by researchers at the Texas Center for Educational Research regarding effective reading programs, CIRC was identified as an effective reading program. CIRC has also been approved by the U.S.

Department of Education's Program Effectiveness Panel as a National Diffusion Network effective program (Briggs & Clark, 1997).

Development of Reading PALS:

Simmons, Fuchs, Fuchs, Hodge, & Mathes (1994) developed a supplemental reading intervention using principles of CWPT and CIRC. The modified CWPT (CWPT-M) was an elaborated version of CWPT that included structured activity components of Repeated Reading, Paragraph Summary, and Story Retell, which are derived from CIRC (Stevens et al., 1987). The Comprehensive Reading Assessment Battery (CRAB) was administered as a pre-treatment and post-treatment measure in order to assess gains in reading achievement. Although there was no significant difference in the reading fluency scores for the CWPT and the M-CWPT group, the M-CWPT group performed better on the reading comprehension by answering more questions than the CWPT group. This modification in CWPT was referred to as Peabody Class-wide Peer Tutoring (Mathes, Fuchs, & Fuchs, 1995), and is now referred to as Peer Assisted Learning Strategies (PALS).

PALS-Reading is a combination of Classwide Peer Tutoring and Comprehensive Integrated Reading and Composition (CIRC). Classwide Peer Tutoring offers an "outline" that can be used in any subject area by determining the functional academic target, and training students in the procedures of tutoring and giving feedback. Comprehensive integrated reading and composition brings in more structure and uniformity. PALS incorporates structured activities with verbal interaction and feedback between tutors and tutees, and also reciprocity of

tutoring roles (Fuchs et al. 2001). PALS focuses on a particular area (PALS-Reading, PALS-Math) and includes activities specific to that area. For example, activities in PALS math include coaching and practice. PALS-Reading was first developed for Grades 2-6 but was later extended to Kindergarten, first grade, and high school (Fuchs et al., 2001). Activities in PALS reading include partner reading, paragraph shrinking, and prediction relay. PALS varies by grade level, with a different version of PALS for K-1, and high school, in addition to the originally developed version for Grades 2-6. PALS serves as a very good supplemental program to improve reading comprehension, as the activities involved are structured in a way to develop skills that will lead to improved reading fluency that facilitates performance in reading comprehension (LaBerge & Samuels, 1974). PALS-Reading has been identified by the U.S. Department of Education's Program Effectiveness Panel as an effective educational practice (<http://www.vanderbilt.edu/CASL/links.html>).

PALS-Reading Procedure

PALS includes three main activities that engage pairs of students. Prior to implementing PALS, the class is rank-ordered based on the students' performance on the baseline probe. Students are then divided into two groups. The highest scoring student from one group is paired with the highest scoring student from the second group and so on until all of the students have a partner. Pairs are also assigned to one of two teams, and students earn points for their team by completing the reading activities correctly. The students in pairs maintain score by marking numbered score cards. The teacher monitors the

activities and awards points to pairs for cooperative behavior and following the procedure correctly. At the end of the week, students report the last number marked on the score card and calculate the total score to determine the winning team. The class then applauds the winning team for its performance. Teams and pairs are changed after every 4 weeks (Fuchs, Fuchs, Mathes, & Simmons, 1997).

PALS Activities

PALS activities include Partner Reading to improve fluency and accuracy, and Paragraph Shrinking to develop comprehension by being able to summarize the content. (Simmons et al., 1994). Prediction Relay, an extension of Paragraph Shrinking, requires students to make predictions based on the information they have read (Fuchs et al., 2001).

Partner Reading is the first activity wherein the paired students read to one another. The higher-functioning peer first reads the text to the lower-functioning peer for 5 minutes while the listener provides corrective feedback, followed by the lower-functioning peer reading the same text for 5 minutes while the higher-functioning peer provides feedback. This activity is expected to improve reading fluency. If the student responds incorrectly or misses a word, the partner responds by saying "Stop, you missed the word. Can you figure it out?" If the tutee cannot correct his mistake within 4 seconds, the tutor gives the answer and asks the tutee to read the sentence again. After both students have read the material, the lower performing peer retells the sequence of events for 2 minutes

and is awarded 10 points for correct retell (Fuchs et al., 2000). This activity requires approximately 12 minutes.

In Paragraph Shrinking, the students summarize what they have read. The tutee reads one paragraph, and then identifies the main idea. The tutor assists the tutee in identifying the main idea by asking the tutee guiding questions about the main idea, (i.e., 'who' or 'what', and the most important thing about the 'who' or 'what'). Students earn one point each for identifying the 'who' or 'what', and the most important thing about the 'who' or 'what'. This information is then incorporated by the tutee who summarizes the main idea in 10 or less words. The tutee is awarded one point for correctly summarizing the information in 10 words or less. If the tutee summarizes the paragraph incorrectly, the tutor encourages the partner to try again. The tutor and the tutee switch roles after 5 minutes as they move on to the next paragraph. This activity takes about 10 minutes.

The third activity, Prediction Relay, is an extension of Paragraph Shrinking. The students predict what will happen in the next paragraph based on the information gleaned from the previous paragraph. The tutee reads the next paragraph after making the prediction, following which they confirm or disconfirm the prediction. Students earn one point for a correct prediction, followed by the procedures in paragraph shrinking of answering guiding questions and summarizing the paragraph in 10 or less words. The prediction relay activity takes about 10 minutes. Prediction Relay and Paragraph Shrinking activities are expected to improve reading comprehension (Fuchs et al., 2000).

PALS-Reading and Academic Performance

Fuchs et al. (1997) explored the effectiveness of PALS-Reading on low achieving students, with and without a disability, and a group of average students, using the Comprehensive Reading Achievement Battery (CRAB) as a measure. There was a significant increase in the CRAB scores from pre-treatment to post-treatment for all the three groups. Another study provided evidence for the effectiveness of PALS on reading skills of kindergartners, specifically in the areas of letter-sound correspondence and blending probes (Falk & Wehby, 2001). Mastropieri et al. (2001) demonstrated the effectiveness of PALS in improving reading comprehension in middle school students with learning disabilities and mild mental retardation. Fuchs, Fuchs, and Kazdan (1999) implemented PALS with high school students, and used the Comprehensive Reading Achievement Battery to measure reading fluency and reading comprehension. Reading fluency scores were found to be comparable for the PALS group and the comparison group, but the reading comprehension scores were significantly better for the PALS group indicating that PALS was effective in improving the reading comprehension scores. One possible explanation for the comparable performance on reading fluency could be that by the time students reach high school, most of them have become fluent readers. In another study by Mastropieri, Scruggs, Spencer, and Fontana (2003), PALS was compared with the use of guided notes to students in order to improve academic performance in a World History course among high school students with disabilities. The performance of the students in the two conditions was

compared using content tests, reading fluency and comprehension strategies. Results indicate a significant difference among the two groups with the peer-tutoring group outperforming the guided notes group in all three areas.

Social Benefits of PALS

A study investigating the social standing of students with learning disabilities in PALS vs. No PALS activities determined that students with learning disabilities in the PALS setting enjoyed better social acceptance compared to students with learning disabilities in the No PALS activities as measured by the 'How I feel towards others' (HIFTO) scale (Fuchs, Fuchs, Mathes, & Martinez, 2002). However, the findings of this study need to be replicated as there was no pre-test measure of the HIFTO scale. As such, social acceptance could have existed prior to the interventions, and therefore not the result of the PALS activities. Another study by Locke and Fuchs (1995) investigated the social benefits of PALS among three fifth and sixth grade boys with a behavior disorder. In this study; the researchers implemented only the first PALS activity of 'partner reading', and examined its effect on the on-task behavior (directing eyes toward task, teacher or peer, remaining in his seat, and keeping hands to himself) and social interactions (positive move towards peer in the form of a pleasant smile, pat on the back, or a verbal statement, or a movement to display support, positive feeling, agreement or cooperation). Results showed a considerable increase in the frequency of on-task behaviors and positive social interactions as a result of the PALS activity.

Curriculum-Based Measurement (CBM)

Curriculum-based measurement is a progress-monitoring procedure that makes use of content in the student's curriculum. For example, a student might read aloud for one minute from his grade level textbook, and the teacher will record the number of words read correctly. It is a quick method of determining progress, and hence can be used frequently by teachers to make decisions pertaining to modifications in an instructional program (Deno, 1985). Curriculum-based measurement was developed for monitoring progress for special education students and determining effectiveness of the instructional interventions (Deno, 2003). There are several advantages of CBM including simplicity of use, improved communication of student performance, increased sensitivity to change due to more frequent progress monitoring, improved database for instructional modification decision-making, and cost-effectiveness. (Deno, 1985).

Curriculum-based measurement is used to monitor progress in reading, spelling, writing, and math. In one study, Marston, Mirkin, and Deno (1984) investigated the effectiveness of CBM (reading, spelling, and written expression) for screening, referral and identification for special education compared to the traditional method. It was noted that only 25% of teacher referrals, based on traditional evaluation, actually qualified for special education services under the district criterion, compared to 80% of students who were determined as learning disabled based on weekly CBM probing in reading, spelling, and written

expression. This indicated the effectiveness of CBM as an efficient and valid tool in identifying students with special needs.

CBM –Reading

Curriculum-based measurement for reading is a measure of reading fluency that assesses the number of words read correctly in one minute. The Theory of Automatic Information Processing in Reading emphasizes the importance of automatic processing of lower-order skills, like word recognition, in order to attend to the more complex higher-order skills, like comprehension (Laberge & Samuels, 1974). Based on this theory, it is inferred that students performing better on reading fluency would perform better on reading comprehension than students who perform poorly on reading fluency. In one study by Fuchs, Deno, and Mirkin (1984), frequent curriculum based measurement over an 18-week period improved student achievement and student awareness of learning when compared to achievement and awareness in students whose teachers implemented the traditional monitoring methods. In a study by Hintze, Callahan, Matthews, Williams, & Tobin (2002), performance of African-American and Caucasian elementary school children on reading comprehension was compared using CBM reading fluency scores, developmental level, socio-economic status, and ethnicity, as a predictive measure of student performance on the passage comprehension sub-test of the Woodcock-Johnson (Revised). This study found that only the developmental level and the reading fluency scores predicted performance on the passage comprehension sub-test. These results indicate that CBM is a fair progress-

monitoring method that does not discriminate on grounds of socio-economic status and ethnicity.

CBM has been used with PALS only when PALS was implemented for math instruction. There is no known study using CBM with PALS reading. This could be due to the fact that Reading PALS is structured in a way as to improve reading comprehension rather than reading fluency. However, keeping in mind the automaticity theory (LaBerge & Stevens, 1974), we can infer that reading fluency scores can fairly predict performance on reading comprehension.

The present study investigates the effectiveness of PALS in improving reading fluency for students in Grades 4-6 as measured by CBM. In addition to providing information about the effectiveness of PALS at the different grade levels, the study also compares the effectiveness of PALS in different settings (general education, resource room, and inclusion) using a sensitive assessment measure that enables progress monitoring across three measurement occasions during the school year.

CHAPTER II

Method

Setting

This study evaluated the effectiveness of Peer Assisted Learning Strategies (PALS) in a school district that was funded by the State Improvement Grant (SIG) for implementing 'PALS' in Grades 4 through 6. A total of 5 elementary schools, and one middle school from one suburban school district participated in this study. The following district demographic data is based on enrollment for the school year 2003-04. The school district had an enrollment of 6,463 students. 3% of the students are Asian or Pacific Islander, 15% are Black, 2% Hispanic, 3.8% multi-racial, and 75% White. Less than one percent of the students are considered economically disadvantaged. With reference to achievement, the district was rated 'Effective'. The district achieved results at the 'proficient level' in all subject areas of 4th Grade and 9th Grade proficiency testing. 6th Grade Citizenship, Reading, and Science were the three subject areas that had a below standard passing rate to be considered 'proficient'.

All fourth, fifth and sixth grade general education and special education teachers in the four elementary schools were encouraged to attend the PALS-CBM training. Nineteen teachers attended the PALS-CBM training, and fourteen of these teachers implemented the intervention in their classrooms.

Participants

The study had a total of 324 student participants from five suburban elementary schools and one middle school. There were 206 students in Grades 4-6 who received PALS instruction and 118 students in Grades 4-5 in the control group. There were no control groups for Grade 6 or for resource room students in Grade 4. (see Table 1). Considering the small sample size of students with disabilities, statistical analyses comparing the three settings was not conducted. However, teacher feedback on implementing PALS with students with disabilities was taken into consideration for evaluating use of PALS with students with disabilities. The schools served a comparable number of students from different ethnic populations (see Figure 1). All schools were rated as 'effective', except for one that was rated as a 'continuous improvement' school according to Ohio's Accountability system (<http://www.ode.state.oh.us>).

	General Education		Inclusion		Resource Room	
Grade Level	PALS	No PALS	PALS	No PALS	PALS	No PALS
4	74	55	08	03	07	00
5	34	55	21	03	06	02
6	30	00	13	00	13	00

Table 1
Number of Participants by Grade level, Setting, and Treatment

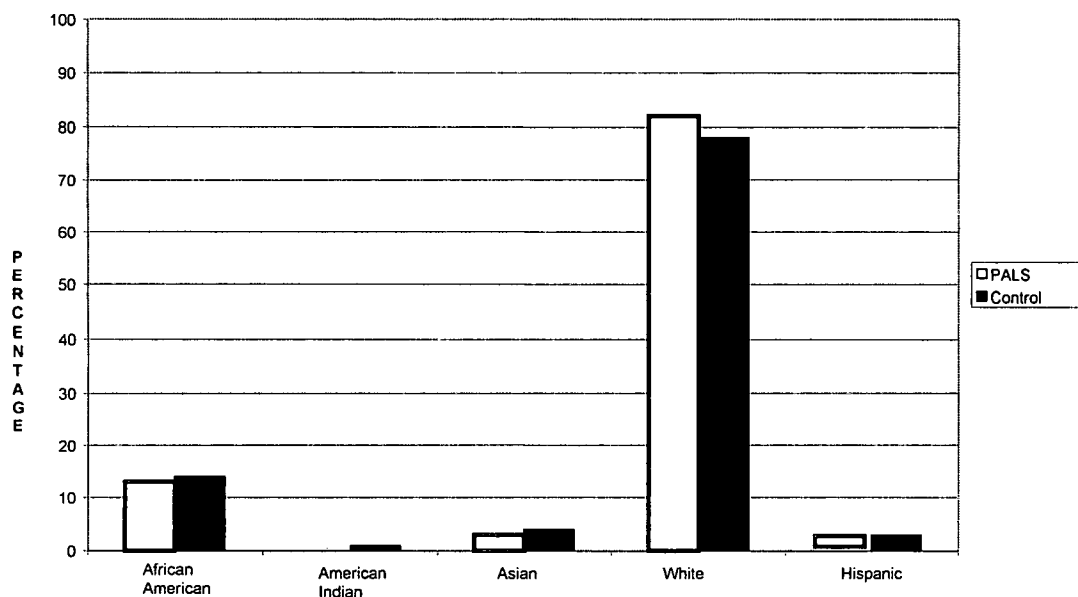


Figure 1.
Racial/Ethnic Distribution of Participants in the PALS Group and the Control Group.

Research Design

A mixed design with within - and between-subject comparisons was used in the study. The performance of students in the PALS group and the control group was compared over two measurement occasions.

Procedure

PALS activities were scheduled for a period of 20 minutes, three times during the week for a period of 15 weeks. All the teachers conducted the first activity of Partner Reading. Seven teachers conducted the activity of Paragraph Shrinking. None of the teachers conducted the activity of Prediction Relay. Baseline data for reading were collected in September by administering CBM

reading probes as a measure of reading fluency. CBM reading fluency probes were administered every week only for students receiving special education. Students in the general education classroom were administered CBM probes twice during the year, first in fall 2003, and then in winter 2004.

Measures and Analysis

PALS Implementation Checklist. Treatment integrity was measured by the Intervention Specialist who completed two PALS implementation checklists twice in each classroom for the four schools during the 15-week implementation. Two state improvement grant evaluators and one graduate assistant also completed a treatment integrity checklist in two schools. The PALS Implementation Checklist is designed by the developers of the PALS program and is a part of the program.

Social Validity. Teachers completed a social validity checklist after PALS implementation in their classroom. Teachers also had the opportunity to extend their responses by providing comments. Both scores on the social validity checklist, and teacher comments were used to determine the degree of acceptability of the intervention to the teachers. The Social validity checklist appears in Appendix B.

Curriculum-Based Measurement (CBM). CBM is a standardized, short-duration measure of skill fluency. Each student was individually administered grade level reading passages from the curriculum. After a brief introduction, the student was asked to read aloud, while the teacher recorded the errors and words correctly read in one minute. Oral reading fluency (ORF) scores were collected in fall and in winter. At the end of the intervention, ORF scores for the

PALS group and the control group were compared across time (fall to winter). Average growth in weekly gain in words read, was also calculated for each grade level.

Oral Reading Fluency – Assessment Integrity Checklist. Treatment integrity for administering CBM probes was monitored by the Intervention specialist using a formal checklist. Teachers were observed administering the CBM probes on two separate occasions using the formal measure of the Oral Reading Fluency – Assessment Integrity Checklist. The Oral Reading Fluency – Assessment Integrity Checklist appears in Appendix A. Based on the number of steps implemented, a percentage score was calculated to determine the degree of treatment integrity in administering CBM probes.

CHAPTER III

Results

Treatment integrity for PALS

Based on the treatment integrity checklists completed for 12 teachers, overall treatment integrity for PALS implementation was 51%. The first activity of Partner Reading was implemented with 72% integrity. Teachers implemented the second activity of Paragraph Shrinking with 57% treatment integrity. The third activity of Prediction Relay was not implemented by teachers. Overall the treatment integrity for PALS implementation was low.

Treatment Integrity for CBM

Oral Reading Fluency assessment Integrity checklist was completed by the Intervention Specialist who observed 26 teachers in the PALS group and the Control group. The Intervention Specialist reported acceptable treatment integrity on 26 of the 26 (100%) of the observation occasions.

Social Validity

Twelve teachers completed the social validity checklist for PALS. All of the teachers (100%) agreed that PALS is an acceptable intervention for reading and 84% agreed that PALS was effective in improving the child's reading ability. Overall, 93% reported that they will continue to use PALS as an intervention and 67% consider PALS as an appropriate intervention for diverse group of children.

There is evidence from the teachers' comments that some of the teachers misconstrued PALS to be an instructional program, which by itself would lead to improvement in reading achievement. In reality, PALS was developed as a supplemental program intended to facilitate the improvement in reading achievement by giving students an opportunity to practice what they learn in the regular instructional program. According to one teacher, "I liked PALS, but it should not be the only reading program in place. The students (all with IEP) loved PALS. They would ask to do PALS. I witnessed a lot of growth with these low readers. They gained confidence. It was fun to read with a 'pal'. They loved the points, even though I had no reward for the points. We will continue to do PALS for the rest of the year. The most difficult part for PALS was scheduling the time, and the administering CBM probes."

Other teachers commented that PALS was not as effective when students differed greatly from one another in their reading skills, "This is a difficult intervention to implement in the resource room setting when you have children who read at third grade and fourth grade levels and are paired up with children who are non-readers or with children who read at the beginning at 1st Grade level. There is no way the lower functioning child can reciprocate progress to the higher functioning child. The use of points was very distracting to my students who tended to focus more on the point sheets as opposed to the reading process involved. I think this is a great program for more capable readers because it increases their fluency, and helps with comprehension. I think the program needs to address how it can meet the needs of 4th and 5th grade students with Pre-K – 1

level reading skills." Similarly, another teacher pointed out, "The students seemed to like reading together in the beginning. As the weeks went on, the good readers became frustrated with the slow readers. I do not feel that this program helped the readers that were already doing well. It did seem to give confidence to those children who had reading problems."

One teacher indicated that PALS was not effective in improving reading comprehension. According to her, "While PALS improved oral reading somewhat, I do not feel comprehension was improved much. Low comprehending readers did not improve. This approach would be good to use once a week, but not thrice a week. Instruction in other important reading skills suffered too much because of it. I would only use it as a supplement to a more formal approach as we have so many students who barely passed the proficiency last year. They need more intensive targeted instruction."

Some teachers suggested changes in CBM administration and frequency of administration. One teacher suggested use of varied probes. She stated, "Need more consistency with probes. Too many probes from the same reading were selected. Weekly probing was a distraction to regular education teachers. Paragraph Shrinking is a great strategy. The better readers like the probes, but the poor readers dreaded them. Some partner groups worked well. With inclusion, the levels of reading made partnering more difficult." Another teacher indicated, "I do not think that weekly CBM probes are needed. I believe that a 3-4 week spread would work better and would be more doable for special education. I enjoyed watching the children read and help each other. I saw an overall gain in

words per minute with all my students. I also plan to continue the program for the rest of the school year."

One teacher noticed that students seemed to lose interest in PALS over time, and that 15 weeks was too long for the program.

One teacher found it difficult to implement PALS with the special education students due to logistical problems. According to her, "I believe that some of the strategies in this program are great. However, the methods in using them are where I will defer from the program. Also, with 1-2 IEP students in my class, I found this worked. However, if I had non-readers/MH students in my class, this would be hard to do on a consistent basis, especially when 4th grade is so geared to on/above grade level material for the proficiency tests."

One teacher noticed changes in student behaviors. According to her, "The implementation of the PALS program certainly influenced the success levels in the classroom. More importantly, I observed behavioral changes in students. This particular class was identified with IEP students as well as the behavior problems. While working with PALS, the children became more positive and accepting of others' differences. The climate and cooperation level within the class changed significantly due to PALS. Hand in hand, we had the bullying program, and these children who were bullies, changed their ways."

PALS vs. No PALS

Descriptive statistics indicated that there was an increase in ORF scores from 100 in fall to 124 in winter for the PALS group, compared to the Control group that had an average increase from 105 to 118. (See Figure 2).

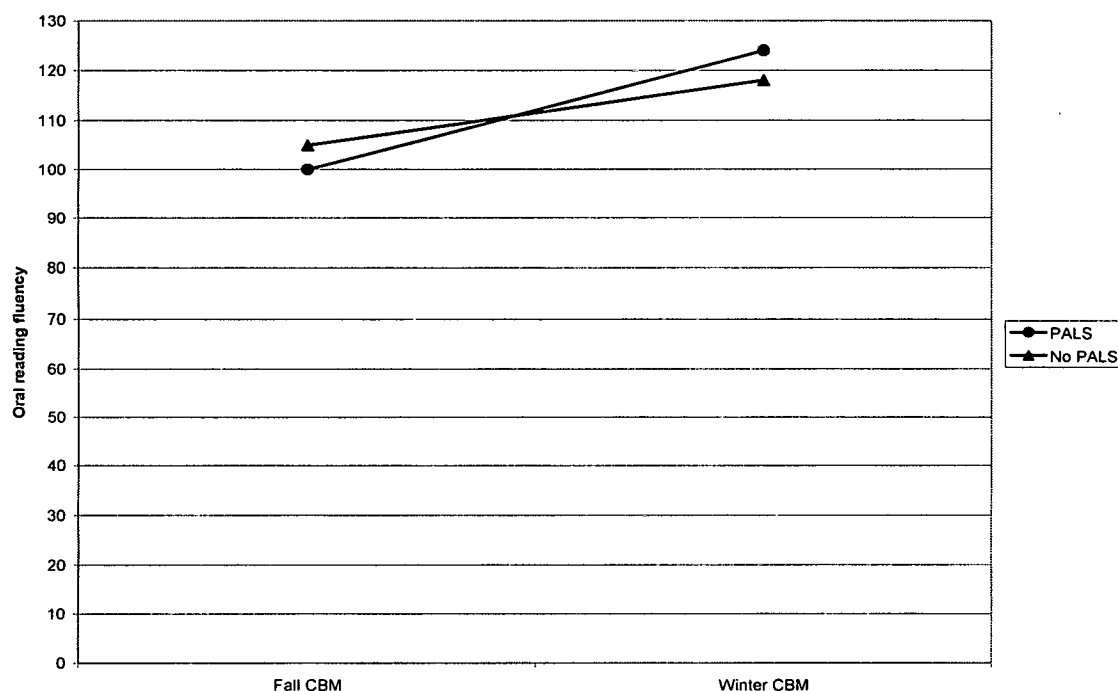


Figure 2
Comparison of Student Achievement in Reading Fluency (PALS vs. No PALS)

A one way analysis of covariance (One-way ANCOVA) was conducted to compare oral reading fluency for students in the PALS group with students in the control group. Considering the unequal representation of students with disabilities in the PALS group and the Control group, the ANCOVA compared students in the general education setting across the two groups. The independent variable was PALS. The dependent variable was the final score on the CBM measure of reading fluency. The ANCOVA was significant, $F(1, 239) = 18.34$, $p < .01$, partial eta square = .07 (See Table 2). The strength of relationship between the PALS and the final score was moderate, as assessed by a partial

eta squared of .05. The results indicate that the PALS group ($M = 124$, $SD = 41$) significantly outperformed the Control group ($M = 118$, $SD = 34$).

Source	df	Mean Square	F	p
PALS	1	6847.71	18.34	>.01*
Error	239	373.38		

Table 2
Analysis of Covariance: PALS VS. NO PALS (General Education setting)

PALS and Settings

Statistical analyses were not conducted considering the small sample size of students with disabilities in the Control group.

PALS and Grade Level

Descriptive Statistics were conducted to determine and compare the average ORF score in fall and winter for Grade 4 (See Figure 4), Grade 5 (See Figure 5), and Grade 6 (See Figure 6) in the PALS group and the Control group (See Table 3).

Grade Level	PALS		No PALS	
	Fall	Winter	Fall	Winter
4	78	105	108	116
5	92	108	95	113
6	79	100		

Table 3

Comparison of average oral reading fluency score in fall and winter for grade levels (PALS vs. No PALS)

A one-way analysis of variance was conducted to compare score differences from fall to winter administrations of CBM reading fluency for students in the Grades 4, 5, and 6. The dependent variable was the score difference. The ANOVA was significant, $F(2,199) = 6.15$, $p < .01$ (See Table 4 and Figure 3). Follow-up tests were conducted to evaluate pair-wise differences among the means. There was a significant difference ($M = 12.88$, $SD = 3.51$) in the mean score difference between students in Grades 4 and 5, with Grade 4 showing a greater gain in score compared to Grade 5.

F	df1	df2	p
6.15	2	199	>.01*

Post-hoc comparison for Grade level

Grade (I)	Grade (J)	Mean score difference (I-J)	p
4	5	12.88	>.01*
4	6	6.48	.19
5	6	6.39	.21

Table 4

One Way Analysis of Variance (One way ANOVA) for three grade levels: Grade 4, 5 and 6.

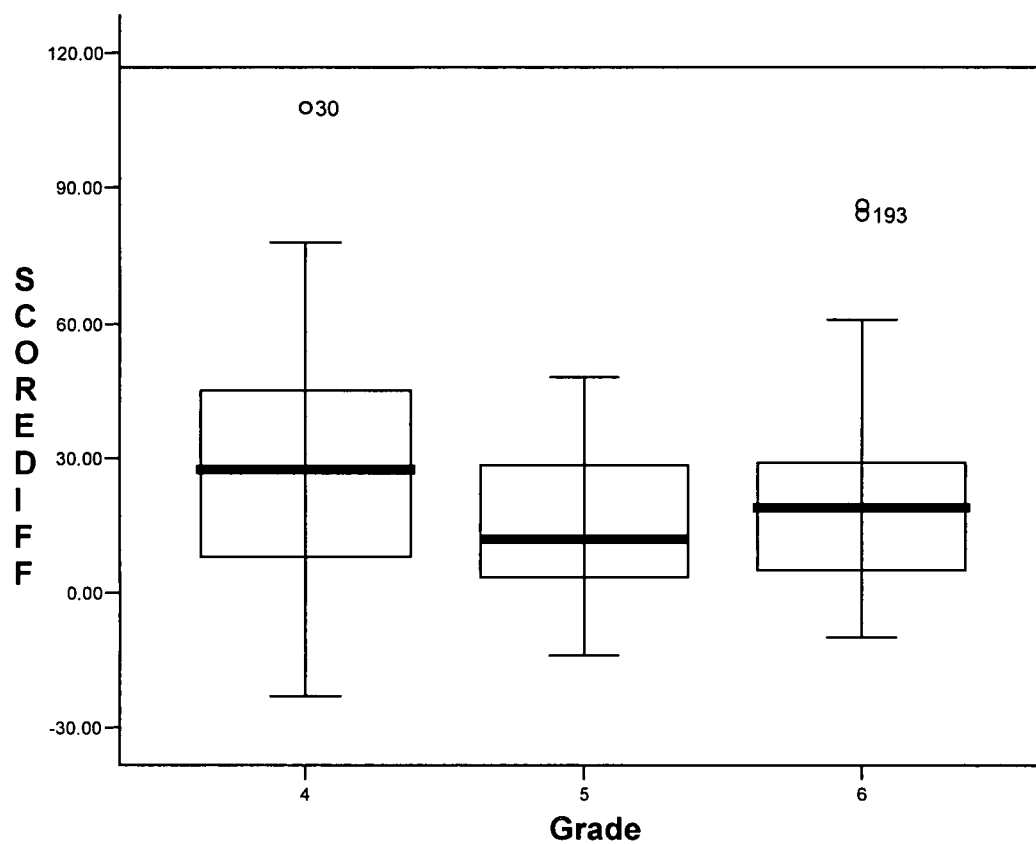


Figure 3
Box and whisker plot indicating results of ANOVA for grade level 4, 5, and 6.

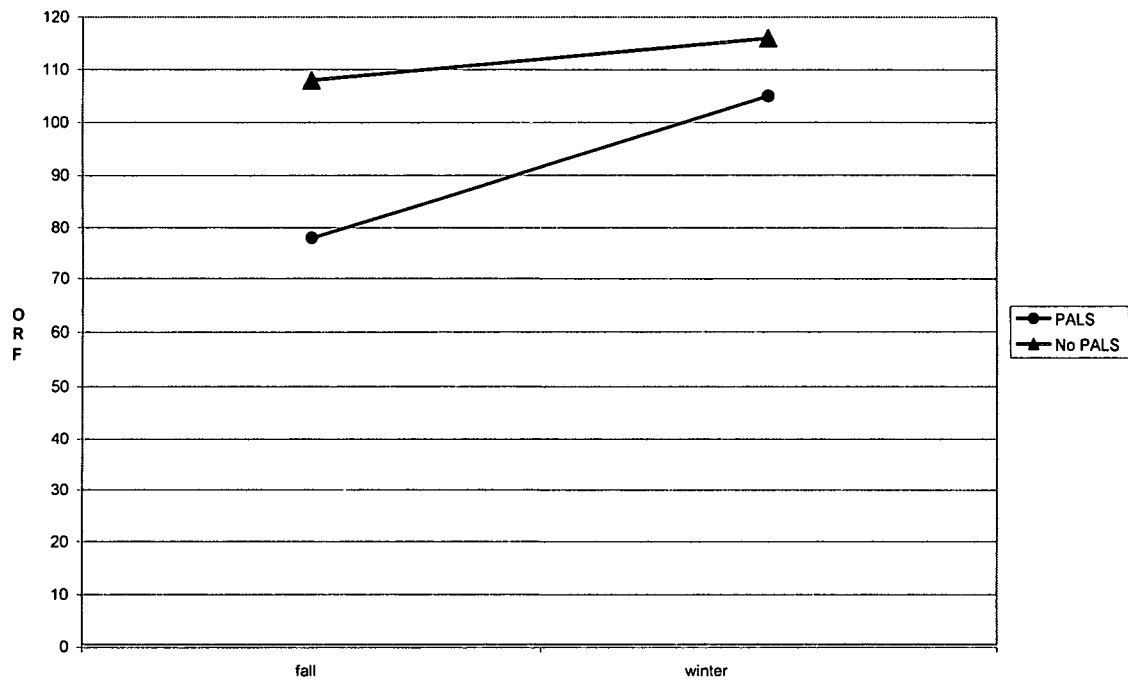


Figure 4
Change in average ORF from fall to winter for PALS vs. No PALS (Grade 4)

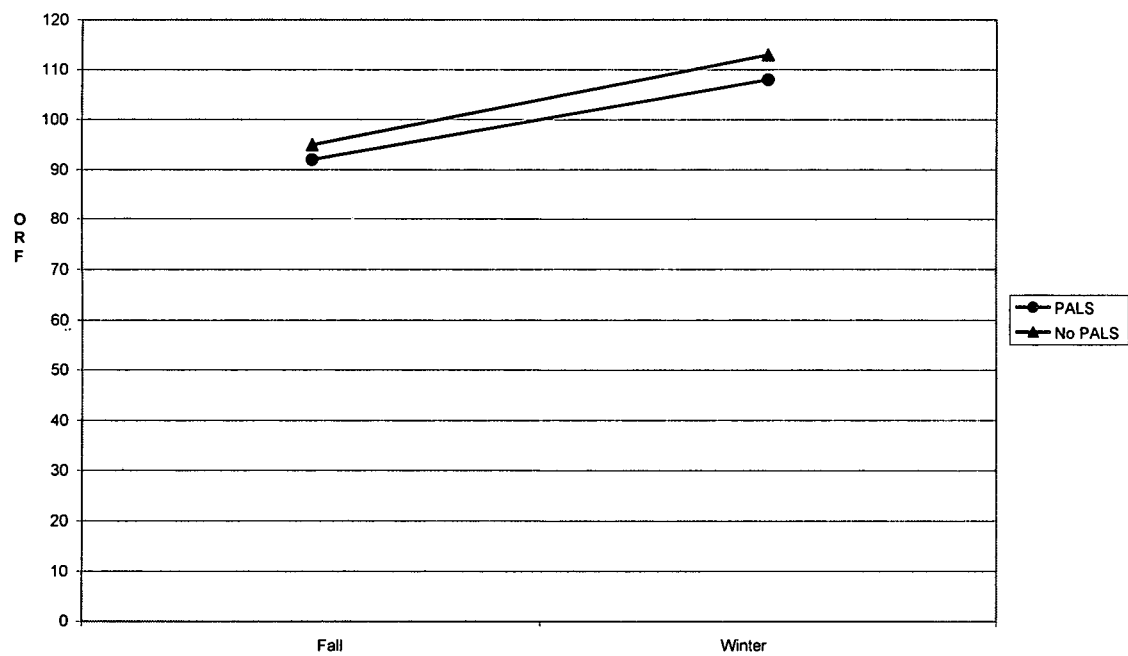


Figure 5
Change in average ORF from fall to winter for PALS vs. No PALS (Grade 5)

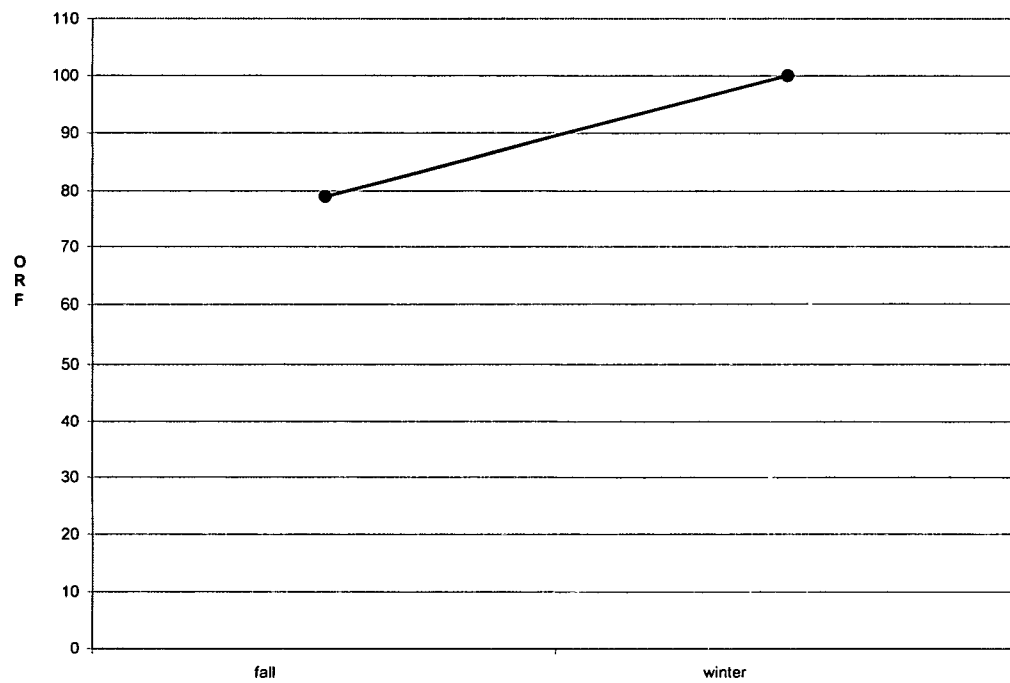


Figure 6
Change in average ORF from fall to winter (Grade 6)

Average increase in words per week

A study conducted by Fuchs, Fuchs, Hamlett, Walz, and Germann, (1993), attempted to determine the average increase in words per week that can be expected from students at different grade levels. In this study, the average gain of words per week for students in the PALS group and students in the Control group for Grades 4, 5, and 6 was calculated by dividing the score difference between fall and winter scores by the number of weeks that PALS was implemented, and was compared to the expected increase determined by the research study cited above (See Table 5).

Grade Level	PALS Gain	Control Group Gain	Expected Gain
4	2.16	0.91	0.84
5	1.07	2.00	0.49
6	1.64		0.32

Table 5
Comparison of average words gained per week with the expected gain per week

CHAPTER IV

Discussion

The findings of this study indicate that PALS was effective in increasing the oral reading fluency scores for students in Grade 4 as compared to the performance of students in the control group. Students in Grade 5 who participated in the PALS program also demonstrated gains in oral reading fluency that exceeded the expected gains for that grade level based on research, however these gains did not surpass the gains achieved by the control group. Students in Grade 6 who participated in the PALS program demonstrated gains in oral reading fluency that exceeded the expected gains for that grade level based on research. No control group was available for comparison at Grade 6. In general, the results of this study are consistent with previous research literature providing supporting evidence of the effectiveness of PALS.

The finding that Grade 5 students who participated in the PALS program did not obtain gains greater than the control group could possibly be understood as a failure to secure adequate treatment integrity. It could also be attributed to the fact that PALS was misconstrued as a Reading Instruction program to be used independently, as indicated by some teacher comments in the social validity checklists.

When comparing the average increase in words per week of students in this study, to the expected average increase determined by Fuchs et al. (1993), both the PALS group and the Control group have surpassed the expected increase. However this comparison may not be appropriate, because even though the sample size for the previous study was large, the characteristics were different. The sample in the study by Fuchs et al. had 35 - 55% of students from low SES background, compared to 0.5% of students from low SES in this study.

Teacher feedback in the social validity checklist provided some very useful information. Teachers indicated that students enjoyed the PALS activities. Teachers reported that the confidence levels of the poor readers increased as a result of PALS. Another positive result seen in the classroom was related to the change in student behaviors, and students demonstrated positive behaviors as a result of PALS. On the other hand, teachers indicated that PALS was beneficial for the poor readers, but thought that fluent readers did not benefit from PALS. One teacher's comment highlighted the difficulty of assigning students to pairs in the resource room setting who were reading at different grade levels.

One limitation of this study was the poor treatment integrity in implementing PALS. Another limitation was that there was no control group for Grade 6. Also, there was a larger sample of students with disabilities in the PALS group (33% of all students in the PALS group) students compared to the control group (7% of student in control group). Taking into consideration the comments made by teachers about PALS, it appears that although teachers liked PALS, they found PALS implementation to be complicated.

Future research needs to focus on studying the effects of PALS as a function of setting (general education, inclusion, and resource room), and grade level using a larger sample size. Also future research needs to study the effectiveness of PALS for students receiving instruction in the resource room, but in future research these students need to receive PALS in the inclusion setting.

Appendix A

Oral Reading Fluency
Assessment Integrity Checklist

Directions: As the observer, please observe setup and direction, time and score the test with the examiner, check examiner's accuracy in following procedures, and decide if examiner passes or needs more practice.

Fine Needs Practice

_____	_____	Performs standardized directions verbatim
_____	_____	Hold clipboard and stopwatch so child cannot see what he/she records
_____	_____	Starts stopwatch after the child says the first word of the passage
_____	_____	For first word waits 3 seconds for child to read the word. After 3 seconds, says the correct word, starts the stopwatch, and scores the first word as incorrect.
_____	_____	For all words, if child hesitates or struggles with a word for 3 seconds, says the correct word as incorrect.
_____	_____	Puts a slash through words read incorrectly.
_____	_____	At the end of 1 minute, places a bracket after the last word provided, and says "Stop".
_____	_____	Records the number of correct words.
_____	_____	Shadow score oral reading fluency with the examiner. Is he/she within 2 points of the final score?

Appendix B

(SOCIAL VALIDITY CHECKLIST – PALS)

Name: _____ School: _____ Grade: _____

Please answer the following questions about **Peer Assisted Learning Strategies (PALS)** by circling the number that best describes your opinion. If an item is not relevant for you, please mark N/A before the item number.

1. This intervention was acceptable to me, and fit into my normal daily routine.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

2. My students enjoyed participating in this intervention.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

3. I believe that this intervention has significantly improved the reading skills of my average students.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

4. I believe that this intervention has significantly improved the reading skills of my poor readers.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

5. I was satisfied with the in-service training for this intervention.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

6. I was satisfied with the coaching and/or follow-up support for this intervention.

1	2	3	4	5
Strongly disagree	Somewhat disagree	Neutral	Somewhat agree	Strongly agree

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