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Additive Effects of Contingent Rewards and Performance Feedback on Reading Performance Under Intensive Reading Instruction

Erin E. Carroll
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a dissertation written by Erin E. Carroll entitled "Additive Effects of Contingent Rewards and Performance Feedback on Reading Performance Under Intensive Reading Instruction." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

<div align="right">Robert L. Williams, Major Professor</div>

We have read this dissertation and recommend its acceptance:

Christopher H. Skinner, R. Steve McCallum, John Malone

<div align="right">Accepted for the Council:

Carolyn R. Hodges

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ADDITIVE EFFECTS OF CONTINGENT REWARDS AND PERFORMANCE FEEDBACK ON READING PERFORMANCE UNDER INTENSIVE READING INSTRUCTION

A Dissertation
Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Erin E. Carroll
August 2008

DEDICATION

I would like to dedicate this dissertation to my family. You have instilled in me a value for education and life-long learning and provided me with a true understanding of success—personally and professionally! Special thanks to Jeff and to my parents, Mike and Jane, for encouraging me to follow my dreams and for supporting me throughout my many years of higher education!

ACKNOWLEDGEMENTS

ABSTRACT

Two different interventions were implemented with 22 students receiving intensive reading instruction. A repeated-measures ANOVA, graphic analysis, effect sizes, and raw score gains were used to examine the effects of 1) performance feedback only and 2) performance feedback plus contingent rewards on several reading variables: fluency, comprehension, self-reported interest in reading, and voluntary engagement in reading. Four 3rd-grade classrooms were assigned to treatment conditions. Students in both conditions received 2-2.5 hours of reading instruction per day.

All students completed assessments of fluency and comprehension twice per week during the treatment phase of the study. Students in the performance feedback only condition completed these assessments and received feedback about their performance. Students in the performance feedback plus contingent reward condition completed the same procedures but also received rewards contingent upon improvement over previous performance; students received one sticker for increasing their reading fluency score and/or one sticker for increasing their reading comprehension score. Stickers could be used to purchase backup rewards. Prior to, at the conclusion of, and four months following the conclusion of the intervention, all students completed measures of reading skill, reading interest, and a choice condition to assess voluntary engagement in reading.

A statistically significant main effect on oral reading fluency was obtained but no significant main effects were found for retell fluency, voluntary engagement, or self-reported interest. Furthermore, no between-subjects main effects or interaction effects were found between conditions and phases. Results based on graphic analysis of data, effect sizes, and raw score gains indicated that students in both conditions showed

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improvements in reading fluency and comprehension, with students in the feedback only condition making greater overall gains on the former and students in the feedback plus reward condition making slightly greater improvements on the latter. Additionally, graphic representations of data show differences between the conditions on measures of voluntary engagement and self-reported interest. On the voluntary engagement measure, students in the feedback plus reward condition made greater gains than the feedback only group. On the self-reported interest survey, the feedback plus reward condition decreased throughout the study whereas the feedback only group increased.

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INTRODUCTION

Undoubtedly, the ability to read is critical for success in life. Literacy contributes to all other academic areas and is valued for economic and social development (Snow, Burns, & Griffin, 1998). Past research has shown that students with poor reading skills may exhibit such problems as aggression, hyperactivity, poor effort, poor self-concept, and school departures (Good, Simmons, & Smith, 1998; Stoddard, Valcante, Sindelar, O'Shea, & Algozzine, 1993).

Given the importance of reading, it is troubling that in 2005, the National Assessment of Educational Progress (NEAP) reported that only 31% of the nation's 4th-grade students demonstrated proficiency in reading. The report is even more disconcerting when one examines the performance of minority students and those from low socioeconomic backgrounds. Among minority students in the fourth grade, 13% of Black students and 16% of Hispanic students were at or above proficiency, compared to 41% of their White peers. Among 4th-grade students eligible for free or reduced lunch, only 16% performed at or above proficiency (Perie, Grigg, & Donahue, 2005). Clearly, these figures demonstrate a need for more effective reading education among students, particularly minority students and those at a low socioeconomic level. Therefore, it is imperative that school personnel identify and implement effective methods for improving students' reading performance.

Components of Reading Instruction

Effective reading instruction, according to the National Reading Panel, includes several key components: phonemic awareness, phonics, reading fluency, reading

comprehension, and vocabulary (National Institute of Child Health and Human Development, 2000). Fluency, or automaticity, is a particularly important component of reading; it is a necessary condition for the development of more complex reading skills such as reading comprehension. Because comprehension, or reading for meaning, is the ultimate function of reading, both fluency and comprehension are critical aspects of the reading process. Furthermore, students who lack fluency will likely find reading to be a difficult and time-consuming process. When reading a passage, these students may spend a lot of time sounding out, analyzing, and recalling the meaning of individual words. These processes take so much time, cognitive energy, and attention that comprehending the overall meaning of the passage becomes difficult or impossible (LaBerge & Samuels, 1974). Conversely, students who read words quickly and accurately with little effort are more likely to grasp the meaning of the text. Therefore, fluency is necessary for the development of reading comprehension.

Additionally, as fluency or proficiency increases, the effort required to complete a task decreases. Students who can respond to an academic task quickly, accurately, and with little effort are increasingly likely to choose to engage in that task. On the other hand, students who find academic tasks difficult and time-consuming are likely to avoid those tasks. Motivation, especially for low-performing students, is also an important consideration; students who are not motivated to engage in academic behaviors/assignments may choose to engage in an alternative behavior (e.g., daydreaming, socializing), thus limiting their learning and skill development (Skinner, Pappas, & Davis, 2005).

A salient question to consider when evaluating empirically-based reading programs and interventions is whether these programs alone are adequate to improve students' performance. Additionally, it is important to consider outcomes other than performance that may contribute to students' reading behavior. For instance, students may have the skills necessary to read and comprehend, but merely having the skills does not ensure that students will actually partake in reading. Students can choose to engage in any number of activities in a classroom (e.g., talking to other students, drawing, day dreaming) and it is likely that students will choose to engage in activities that provide the highest amount of reinforcement (Billington & DiTommaso, 2003). An important strategy for educators, therefore, is to increase the amount and/or quality of reinforcement students get from engaging in reading. Intrinsic reinforcement, or intrinsic interest, is the motivation to partake in an activity because of the intrinsic satisfaction one gets, and not because of external benefits or rewards (Deci, 1975). Thus, in addition to reading skill, it is also important to examine students' intrinsic interest and engagement in reading.

Instructional Hierarchy

Haring and Eaton (1978) provided a framework for describing various stages of skill development. They described the series of hierarchical stages through which skill development proceeds: acquisition, fluency, generalization, and adaptation. Acquisition is the period in which students acquire a skill and then increase the accuracy with which they respond. Once a skill is acquired, a student must be able to use it fluently in order for the skill to be meaningful. Fluency is often described as the ability to use a skill quickly and correctly. The third stage in the hierarchy is generalization, which is the ability to use

a skill in a different setting or with novel materials. Adaptation, the final stage, describes the modification of a skill to use in the context of more complex behaviors.

Many students referred for skill deficits in reading have failed to master the first two stages of the hierarchy: acquisition and fluency (Daly, Lentz, & Boyer, 1996; Eckert, Ardoin, Daisey, & Scarola, 2000). Therefore, reading interventions typically should target these stages of skill development. The instructional hierarchy provides a framework for targeting each aspect of the hierarchy (i.e., acquisition, fluency, generalization, adaptation) by linking treatment components with different levels of skill development. Many researchers have examined these linkages as they apply to reading (Daly, Martens, Hamler, Dool, & Eckert, 1999; Martens, Witt, Daly, & Vollmer, 1999).

Moving through the hierarchy requires the presence of accuracy, or the ability to read words correctly. This skill is aided by techniques such as modeling, prompting, and cueing. These techniques are common characteristics of methods often described as skill-based procedures (Eckert, Ardoin, Daly, & Martens, 2002). Procedures that target the acquisition stage of skill development are necessary to improve accuracy, but may not be sufficient for increasing functional reading behavior (i.e., reading for meaning). In other words, once a student has acquired a skill, he or she must become proficient in using that skill. Therefore, fluency, the ability to use a skill accurately and quickly, must also be targeted. A common feature of fluency-building interventions is the use of drill, which consists of repeated opportunities to respond to an academic stimulus, and often includes rewards for correct academic responses (Daly et al., 1996; Martens et al., 1999).

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Alternative Reading Interventions

Students' reading skills develop at various paces, so basic reading ability can be viewed on a continuum: some students learn with ease and others require more intensive instruction (Lyon & Moats, 1997). Students with poor reading skills and students with learning disabilities may require supplementary or different instructional procedures from those customary in traditional classrooms. Employing instructional programs designed to prevent and remediate students' reading difficulties may lead to a variety of socially important outcomes including improvement in reading skill, behavioral and social-emotional outcomes, and a reduction in the number of special education evaluations and determinations of learning disabilities (Castillo, Porter, Curtis & Batsche, 2005; O'Connor, Fulmer, Harty, & Bell, 2005).

Researchers have examined various procedures for improving reading performance in classroom settings such as enhanced instruction, academic interventions, and the use of consequences (Rose, 1984; Skinner & Shapiro, 1989). These methods can generally be classified as skill-based or performance-based. Skill-based procedures target specific reading skills. Performance-based strategies such as contingencies and feedback provide information and/or consequences based on performance (Eckert et al., 2000).

Commonly used skill-based procedures include passage preview, taped words, and group interventions combining several procedures such as repeated readings, passage preview, and practicing words in isolation (Begeny & Silber, 2006). Passage preview involves previewing a selection by either reading a passage silently or listening to someone else read the passage before reading it aloud. Numerous researchers have shown that this strategy increases reading fluency (Daly et al., 1999; Rose & Sherry, 1984).

Taped words, an intervention developed by Freeman and McLaughlin (1984), requires

students to listen to an audio recording of words while following along with a printed list.

This procedure has led to increases in oral reading fluency of isolated word lists and has

been effective with various student populations (Skinner & Shapiro, 1989). Repeated

readings is based on the principle of practice; students typically read a passage three

times and are assessed (e.g., correctly read words per minute, errors per minute) on the

third reading. This procedure has also effected increases in oral reading fluency

(Chafouleas, Martens, Dobson, Weinstein, & Gardner, 2004).

Although much research has focused on these types of academic interventions for

improving individual students' reading skill, school- or class-wide instructional programs

have also been employed (Lane & Menzies, 2003; Sharp & Skinner, 2004). One trend in

schools is the use of a tiered model of service delivery in which students receive different

degrees of services or instruction dependent upon their skill level. In such a system,

students who fail to make progress or those who do not show significant progress receive

more intensive interventions. These intensive interventions should consist of evidence-

based practices (Kratochwill, Albers, & Shernoff, 2004). For instance, an intensive

intervention in reading should consist of the critical components of reading empirically

validated by the National Reading Panel: phonemic awareness, phonics, reading fluency,

reading comprehension, and vocabulary (National Institute of Child Health and Human

Development, 2000).

Targeting reading skills is obviously a fundamental goal of educators, and the

procedures used to target the acquisition of early reading skills can be described as skill-

based. However, students' performance may be enhanced through the use of

performance-based procedures, which target reading behaviors after the skill has been

acquired. Two performance-based procedures commonly used to target students' reading

performance are performance feedback and contingent rewards.

Performance Feedback

Active monitoring and frequent evaluation of student progress by the teacher are

two of several instructional factors critical to effective classroom instruction

(Christenson, Ysseldyke, & Thurow, 1989). One way to accomplish progress monitoring

and evaluation is by providing students with feedback regarding their performance.

Researchers have used various procedures such as public posting and performance graphs

to provide feedback. Conte and Hintze (2000) found that performance feedback provided

through graphs had a positive effect on the oral reading fluency of 2nd-grade students.

Specifically, students who received feedback via a graph of their performance

experienced greater improvement in fluency rates than students who received no

feedback.

Other researchers have found that incorporating performance feedback with a goal

line on a graph improved the stability and reliability of the math performance of students

with learning disabilities (Fuchs, Fuchs, Hamlett, & Whinnery, 1991). In a different

study, researchers found that a performance feedback system consisting of public posting

increased several outcomes such as students' completion of reading assignments, correct

spelling words, writing scores, and on-task behavior (Kastelen, Nickel, & McLaughlin,

1984). These studies indicate that performance feedback is an effective tool for

improving various academic and behavioral outcomes.

Contingent Rewards

Rewards have been used to target many student responses such as disruptive behavior, on-task behavior, and academic performance (Wolery, Bailey, & Sugai, 1988). Using contingent rewards has led to improvements in all of these dimensions (Eckert et al., 2002; Noell, Freeland, Witt, & Gansle, 2001; Stage & Quiroz, 1997). Walberg (1984) compared the effects of 26 different instructional strategies and found that rewards contingent upon correct performance resulted in the largest average effect size (1.17) for student learning. Educational professionals have used a variety of rewards to enhance students' performance, such as praise, tokens, stickers, bonus points, and access to free time and other privileges. Several guidelines for using rewards have been offered: rewards should be given for quality of performance, not merely participation in a task; use of rewards should be gradually decreased over time; criteria for earning the reward should be increased as behavior/performance improves; and rewards should be reinforcing (i.e., increase performance; Akin-Little, Eckert, Lovett, & Little, 2004).

Research examining the effects of reward contingencies in the classroom has produced mixed results (Akin-Little et al., 2004; Lalli & Shapiro, 1990). Many researchers have demonstrated the positive effects of rewards on academic performance and classroom behaviors, both individually and in groups, in various student populations (Skinner, Skinner, & Sterling-Turner, 2002). However, other researchers have found evidence supporting the overjustification effect (Oliver & Williams, 2006). The overjustification effect refers to instances in which using extrinsic rewards (e.g., tokens) decreases one's interest or engagement in an activity. In other words, students are less likely to engage in a task after rewards are withdrawn (Deci, Ryan, & Koestner, 2001).

Rewards may affect numerous aspects of behavior such as skill, motivation, and intrinsic interest. Thus, it is important to consider these potential effects when using procedures involving contingent rewards. An additional consideration is the possible impact of rewards when used in combination with an intensive instructional procedure. If the quality and amount of reading instruction are optimized, will rewards contribute to students' performance? Will rewards increase voluntary engagement in reading? Will rewards affect students' self-reported interest in reading?

These questions are answered differently by some members of the cognitive versus behavioral factions. Cognitive evaluation theory states that extrinsic rewards can affect intrinsic motivation in two ways: either by changing an individual's perception of control or changing an individual's feeling of competence and self-determination (Deci, Cascio, & Krussell, 1975). Those from the cognitive perspective would assert that once extrinsic reward contingencies are removed, students' intrinsic interest in an activity decreases. This idea is consistent with the control portion of cognitive evaluation theory, which states that tangible rewards contingent on performance lead to decrements in intrinsic interest because students perceive this arrangement as externally controlling their performance rather than having their performance controlled by their internal locus of causality (Ryan & Connell, 1989). Behaviorists, on the other hand, support the notion that rewards might increase and/or maintain intrinsic interest in an activity. This view is consistent with the competency portion of cognitive evaluation theory, which states that students perceive themselves as successful when they receive rewards based on improved performance.

Separate meta-analyses conducted by Deci, Ryan, and Koestner (1999) and Cameron, Banko, and Pierce (2001) examined the effects of contingent rewards on free-choice behavior and self-reported interest. Cameron et al. found that rewards given for low-interest tasks enhance free-choice behavior (voluntary engagement) and that when rewards are dependent on level of performance, the effects on intrinsic interest are the same as within a control group. However, Deci et al. concluded that contingent rewards decrease free-choice behavior. Akin-Little et al. (2004) found that when within-subject designs (i.e., measuring intrinsic reinforcement over time in an individual) were used, time on task (voluntary engagement) was not adversely affected by rewards.

Combined Procedures

Conceivably, an efficacious strategy for improving students' reading performance would be to use a combination of two or more previously effective performance-based interventions. Chafouleas et al. (2004) investigated the effects of a skill-based intervention (repeated readings) and two performance strategies (performance feedback and contingent reward) on the reading fluency of 3 elementary school students. All participants improved over baseline conditions, but the results show that different combinations of treatments were differentially effective. The authors indicated that some combination of reinforcement and feedback may be most effective with students exhibiting difficulties with fluency and accuracy. Bonfiglio, Daly, Martens, Lin, and Corsaut (2004) used tangible rewards in combination with skill-based treatments to target reading fluency. The combined treatment worked better than either treatment alone, suggesting that skill-based and performance-based procedures may interact in complex ways.

In another study, researchers sought to determine whether the effectiveness of antecedent skill-based interventions (listening passage preview and repeated readings) could be enhanced by the use of rewards and performance feedback. They found that all students' reading fluency increased under the combination of skill-based interventions (i.e., listening passage preview) and performance-based interventions (i.e., performance feedback, contingent reward). For most students, combining the skill-based intervention with either of the two performance-based strategies produced the greatest improvements in performance (compared to skill-based interventions alone) but the most effective combinations varied across students (Eckert et al., 2002).

Taken together, these studies suggest that performance-contingent rewards may offer the greatest benefit to reading fluency when used in combination with other strategies (e.g., academic intervention, performance feedback). However, several aspects of these studies merit cautious interpretation of results. The sole variable assessed by these studies was reading fluency; other student behaviors were not targeted or measured. Furthermore, assessment of fluency under various experimental conditions generally consisted of only one or two data points, eliminating the possibility of observing a trend. Lastly, each of the studies was conducted with a limited number of students, thus restricting the generalizability of findings.

The Current Experiment

In the current study, I examined how performance-based strategies (performance feedback only and performance feedback plus contingent reward) affect student outcomes when used in combination with an intensive reading program. Some research has demonstrated a positive effect for combining rewards and feedback with low-performing

students (e.g., Chafouleas et al., 2004). However, other researchers have suggested that contingent rewards may not offer additional benefits beyond those offered by performance feedback (Chafouleas et al., 2004; Daly et al., 1999; Eckert et al., 2002).

Although these findings suggest that performance feedback alone may be an effective performance-based strategy for enhancing reading fluency, these studies did not measure other variables that may be affected by contingent reward. The primary dependent variable in all of the aforementioned studies was oral reading fluency. Researchers did not measure other significant variables such as reading comprehension, voluntary engagement in reading, or self-reported interest in reading. Also, these studies did not measure the follow-up effects of performance feedback and contingent reward on reading outcomes.

Thus, in the current study, I examined the effects of two different performance strategies, performance feedback only versus performance feedback plus contingent rewards, when used in combination with intensive reading instruction, on low-performing students' reading fluency, reading comprehension, self-reported interest in reading, and voluntary engagement in reading. The proposed line of research was designed to answer several questions: Which has greater utility in improving students' reading fluency and comprehension—performance feedback only or performance feedback plus contingent rewards? How does the addition of contingent rewards to performance feedback affect self-reported interest and voluntary engagement in reading? What are the immediate and delayed follow-up effects of these procedures on students' skill, self-reported interest in reading, and voluntary engagement in reading?

Given past research trends with skill-based and performance-based interventions, I hypothesized that although both treatment groups would increase in reading skill during the study, there would be negligible differences between students receiving performance feedback compared to those receiving performance feedback plus contingent rewards. In terms of intrinsic interest in reading, I hypothesized that the addition of material rewards would provide students with more tangible evidence of their improvement, which would lead students to feel more competent in reading. Therefore, I hypothesized that rewards would increase students' self-reported interest in reading and their likelihood of voluntarily engaging in reading behavior.

Although prior research has shown that adding performance-based elements (i.e., rewards in addition to feedback) did not offer additional benefits in terms of skill, the addition of rewards may lead children to view reading as a more enjoyable activity. This potential effect can be explained by the competency hypothesis, which refers to the perception of rewards based on one's performance. Students who receive rewards (e.g., stickers) may feel they are better (more competent) readers and therefore choose to engage in reading activities and report more interest in reading. On the other hand, contingent rewards may negatively affect intrinsic motivation because the individual may view the reward as an attempt to control behavior as opposed to promoting self-determination (Deci et al., 1975).

Chapter II.

METHOD

Reading Program

The current study took place in an elementary school participating in the US

Department of Education's Reading First program. The program requires the school to

incorporate intensive, research-based reading instruction with a tiered model of service

delivery. Tiered models of prevention and intervention are based on the notion that

intervention resources should be directly linked to student need; students who fail to

make progress receive more intensive intervention (Kratochwill et al., 2004). The

Reading First program mandates student assessment, or benchmarks, three times per

school year (e.g., August, December, and May). School officials give the first benchmark

approximately two weeks after the beginning of the school year. Benchmarks consist of

several different subtests that differ by grade, with certain subtests weighted more heavily

at each grade level. Each benchmark yields a score that is an average of the subtests. This

weighted average falls within one of three classifications: benchmark, strategic, or

intensive. Benchmark describes students whose skill level is above the 40th percentile on

national norms; these students are placed in Tier 1. Students who are classified as

strategic (20th-40th percentile) are placed into Tier 2, and students described as intensive

(below 20th percentile) are placed in Tier 3 (Good & Kaminski, 2003). Students are

assessed a second time at the benchmark in December, and may be placed into a different

tier if they have made, or failed to make, sufficient progress (Herman et al., 2006).

All programs qualifying for Reading First funds must involve explicit and

systematic instruction in the following areas: phonemic awareness, phonics, vocabulary

development, reading fluency (including oral reading skills), and reading comprehension (U.S. Department of Education, 2002). In the setting of the current study, Tier 1 consists of reading instruction in the general classroom with the Scott Foresman core reading program. Although not mandated by the Reading First program, the Scott Foresman program it is one of the programs that qualify for Reading First funds. Tier 1 instruction consists of 90 min of reading instruction; 30 min are spent in whole-group instruction and students spend the remaining time in small groups, rotating to different reading stations in the classroom.

Tier 2 consists of the same 90 min of regular reading instruction provided in Tier 1 plus an additional 30 min of small-group reading intervention per day. The Tier 2 reading intervention requires implementation of the Voyager Passport Intervention Program. Voyager Passport is designed for students who need more instruction than is provided by core classroom instruction and also targets the five essential components of reading (i.e., phonemic awareness, phonics, vocabulary development, reading fluency, and reading comprehension) (Voyager Expanded Learning, 2005). Tier 3 consists of Tier 1 and Tier 2 intervention plus an additional 30 min of pullout intervention with the Read Well Intervention System. Read Well is a developmental first-grade program that is also appropriate for use as a remedial program for 2nd- and 3rd-grade students. (Sprick, Howard & Fidanque, 1998). The program teaches decoding skills, comprehension strategies, and content knowledge while emphasizing the five essential components of reading.

Thus, the intensive instruction condition consists of 90 min of the Scott Foresman Core Reading Program plus 30 min of intervention with the Voyager Passport

Intervention Program and, for Tier 3 students, 30 min with the Read Well Program. All programs target the main components of literacy as identified by the National Reading Panel (National Institute of Child Health and Human Development, 2000). The intensive instruction consists of a total of 2 hr (Tier 2 students) or 2 hr 30 min (Tier 3 students) of reading instruction per day.

Participants

Participants included 22 Tier 2 and Tier 3 students from four 3rd-grade classrooms. All 3rd-grade students who scored in Tier 2 or Tier 3 on the first school-wide benchmark, received parental consent, and signed a student assent form were included in the study. The school, an elementary school in the Southeastern United States, primarily serves racially and ethnically diverse students from low-income neighborhoods. Approximately 90% of students at the school receive free or reduced lunch. In the current study, approximately 41% of the students were Caucasian, 50% were African-American, and 9% were Latino. An equal number of male and female students participated in the study.

Assessment Procedures and Dependent Variables

The dependent variables were students' oral reading fluency scores and retell fluency scores, as well as time spent voluntarily engaging in reading and self-reported interest in reading. Each student completed a school-wide benchmark several weeks into the school year (September), in the middle of the school year (December), and at the end of the school year (May). The benchmarks, which were administered by school staff, measured the following skills: word use fluency, oral reading fluency, and retell fluency. Each of these skills was measured via brief, 1-min probes. The first benchmark served as

a pre-intervention measure of reading skill and determined the tier at which each student would receive instruction. In addition to these school-wide benchmarks, the primary researcher and research assistants administered comparable oral reading fluency and retell fluency probes throughout the study: during the intervention (treatment), after the intervention (immediate follow-up), and again approximately 4 months after the intervention (delayed follow-up).

The brief, 1-min assessment probes used for the school-wide benchmarks were taken from the Dynamic Indicators of Basic Early Literacy Skills, or DIBELS (Good & Kaminski, 2003). These school-wide benchmarks consisted of administering three oral reading fluency and retell fluency probes, which measure oral reading fluency and reading comprehension, respectively. The median of each student's three probes served as his or her score. The school-wide benchmark also measured word use fluency, which was not targeted or included in the current study. For intervention and assessment throughout the treatment and follow-up phases of the study, I used similar, equivalent oral reading fluency and retell fluency probes taken from the Voyager Passport Series (Voyager Expanded Learning, 2005).

The oral reading fluency measure requires students to read aloud from a brief passage. Students read aloud for 1 min while the researcher records the number of errors (words omitted or substituted or hesitations of more than three seconds) and totals the number of words read correctly. The student's score is the number of words read correctly per minute. On the retell fluency measure, students tell as much as they can about what they have just read. After 1 min, the student is instructed to stop. Only words that illustrate the student's understanding of the passage are scored, and the total number

of those words in the student's response serves as the score. At the pre-treatment, immediate follow-up, and delayed follow-up phases, students were administered three probes with the median score for reading fluency and the median score for retell fluency being used as the student's measure of skill at that phase (Good & Kaminski, 2003).

Research on the technical adequacy of oral reading fluency and retell fluency indicates that both measures are psychometrically sound. Oral reading fluency has test-retest reliability ranging from .92 to .97; alternate-form reliability ranging from .89 to .94, and criterion-related validity ranging from .52 to .91 (Shaw & Shaw, 2002). Retell fluency has alternate-form reliability of .57 and criterion-related validity of .51 (Roberts, Good, & Corcoran, 2005). Roberts, Good, and Corcoran also examined the concurrent validity of retell fluency with the Woodcock Diagnostic Reading Battery (WDRB), a measure of student reading achievement. They found that retell fluency scores on two passages correlated with the WDRB Broad Reading Cluster score at .47 and .43, with the average retell score yielding a correlation of .61.

Students completed two additional measures prior to the intervention as well as in the immediate and delayed follow-up phases: a self-reported reading interest questionnaire and a choice condition to assess voluntary engagement in reading. The reading interest measure was the Elementary Reading Attitude Survey (McKenna & Kear, 1990). This scale provides an indication of students' attitude toward reading and yields a score for academic reading interest, recreational reading interest, and total interest. For the current study, only the total interest score was used. The scale consists of 20 items (e.g., How do you feel when you read a book in school during free time?), and students respond to each item by choosing one of four images of Garfield the cartoon cat.

The images range from happiest Garfield (smiling with arms outstretched) which represents a score of 4, to very upset Garfield (scowling with arms at sides) which represents a score of 1. The directions for this survey instruct students to circle the image of Garfield that is closest to their own feelings. Scores range from 20-80. For 3rd-grade students, the average score falls between 57 and 58. The Elementary Reading Attitude Survey has a reliability coefficient ranging from .74 to .89. Authors of the scale also report the survey's construct validity: students who had library cards, had checked out books from the library, and reported less than 1 hr of television watching had significantly higher scores on the survey than their counterparts.

In the voluntary engagement measure, students engaged in a 10-min free-time period during which they could chose to work on various activities: reading from short stories, doing a math worksheet on time and money, doing a connect-the-dots activity, or undertaking a picture-matching task. Observers, the primary researcher and research assistants, used a momentary time sampling procedure to measure students' engagement in reading versus a non-reading activity. At the end of each 30-second interval during the 10-min period, an observer looked at each student and recorded the activity in which he or she was engaged (Wolery et al., 1988).

During the treatment phase, the primary researcher and two research assistants administered the oral reading fluency and retell fluency measures twice per week in conjunction with the treatment conditions: performance feedback only or performance feedback plus contingent reward. Assessment probes were similar to those used during the school-wide benchmarks as well as the immediate and delayed follow-up measures.

Voluntary engagement and self-reported interest were not directly targeted or measured during the treatment phase.

Treatment Conditions

The four classrooms were first combined into two groups to ensure similarly-sized treatment groups. Those combinations of classrooms were then randomly assigned to a treatment condition. There were a total of 13 students in the feedback plus reward group and 9 students in the feedback only group. Table 1 provides a description of conditions and phases.

Performance feedback only. The primary researcher and research assistants assessed students twice per week. After each assessment probe, students received immediate performance feedback; the primary researcher or research assistant told students 1) the number of words he or she read correctly per minute and 2) the number of words in his or her retell. Each student watched the primary researcher or research assistant plot these results on a graph of the student's performance (see Appendix A).

Performance feedback plus contingent reward. Assessment and feedback procedures were identical to those used in the performance feedback condition. However, in the performance feedback plus contingent reward condition, the primary researcher or a research assistant delivered stickers for improvement over the previous assessment of that skill (i.e., an increase in words read correctly per minute = one sticker, an increase in words in students' retell = one sticker). Each skill was rewarded and stickers accrued separately; a student could earn one sticker for an improvement in his or her oral reading fluency score and also earn one sticker for improvement in his or her retell fluency score, but a student could earn a sticker in one area but not the other. As students earned

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Table 1. Description of conditions and phases.

Pre-Treatment		Treatment	Immediate Follow-up	Delayed Follow-up
September →	**September** →	**September-October** →	**October** →	**February**
	1 week	**5 weeks**	**1 week**	**3 weeks**
Benchmark 1 Skill Assessment		Bi-weekly Assessment	Assessment	Assessment
	Reading interest measure		Reading interest measure	Reading interest measure
		Performance Feedback		
	Voluntary engagement measure	or Performance Feedback + Contingent Reward	Voluntary engagement measure	Voluntary engagement measure

Note. Benchmark assessment included oral reading fluency, retell fluency, and word use fluency. All other

assessment activities include oral reading fluency and retell fluency, which measure fluency and

comprehension, respectively.

stickers, they were placed on an index card next to the graph of performance. Students accumulated their stickers on a card and were able to exchange the stickers for back-up rewards of different sticker values. A pencil sharpener was worth one sticker, an eraser was worth one sticker, a pencil was worth two stickers, a notepad was worth three stickers, and high-interest reading materials such as comic books were worth four stickers. Students could exchange the stickers for backup rewards at their discretion. Again, stickers for each skill accrued separately so that a student could not combine stickers for oral reading fluency with stickers from retell fluency to obtain backup rewards.

Phases

    Pre-treatment. There were two parts to the pre-treatment phase: assessment of skill and assessment of intrinsic interest. In the assessment of skill, which took place in August, all students completed the school-wide benchmark. For students in the current study, the benchmark consisted of word use fluency, oral reading fluency, and retell fluency. Three oral reading fluency and retell fluency probes were administered, with the median score on the three probes serving as the pre-treatment measure of skill.

    During the pre-treatment assessment of intrinsic interest, which occurred the week following the school-wide benchmark, students completed two activities. First, students took the Elementary Reading Attitude Survey (McKenna & Kear, 1990), a questionnaire that measures self-reported interest in reading. Second, the primary researcher and research assistants conducted the voluntary engagement measure. Students had a 10-min free-time period during which they could choose to engage in several activities. Choices included various short stories, math activities involving time and money, connect-the-

dots puzzles, and a picture-matching task. Students were not limited to working on one activity for the entire time period; they were told that they could work on an activity for as long as they liked or they could switch between activities.

Treatment phase. During the treatment phase, students participated in one of two conditions—performance feedback only or performance feedback plus contingent reward. Twice per week, the primary researcher or a research assistant measured students' reading fluency and reading comprehension using oral reading fluency and oral retell fluency probes, respectively. Assessment procedures were identical to those used during the pre-treatment phase.

Immediately after completing the probes, students received one of two interventions. Students in the performance feedback only condition received their scores on each of the two measures and watched as the primary researcher or a research assistant plotted those results on a large graph (these data were depicted graphically so that students could see their progress). Students had separate graphs for each skill (i.e., a graph for reading fluency and a graph for retell fluency). Students in the performance feedback plus contingent reward phase experienced the same procedures as students in the performance feedback only condition; however, these students also had the opportunity to earn rewards. After completing the probes and watching the researcher or research assistant plot their scores on a graph, students received stickers contingent upon improvement over past performance. Students earned stickers separately for each skill; if their oral reading fluency and/or retell fluency score was an improvement over the previous measure of that skill, the student received a sticker. As they accumulated stickers, students were able to exchange them for tangible items (e.g., pencils, notepads).

Immediate follow-up. After 6 weeks of intervention, the primary researcher and research assistants again measured students' reading skills using the same procedures as in the pre-treatment condition: three brief probes measuring oral reading fluency and retell fluency equivalent to those used throughout the study. Students did not receive information about their performance or rewards linked to performance. The median score of the three oral reading fluency probes and the median score of the three retell fluency probes served as the immediate follow-up measure of those skills. The primary researcher and research assistants also measured voluntary engagement in reading, and students completed the reading interest survey. All procedures were the same as those used in the pre-treatment phase.

Delayed follow-up. Approximately 4 months after the immediate follow-up phase, the primary researcher and research assistants conducted a series of procedures equivalent to those in the immediate follow-up phase: the researcher and assistants measured students' reading skills, voluntary engagement in reading, and self-reported interest in reading. Due to time constraints in the classrooms, reading skill was measured slightly differently than in the previous phases. Reading skill was assessed via three brief, 1 min probes measuring oral reading fluency and retell fluency with the median of the three scores serving as the delayed follow-up measure of skill. However, these three probes were administered over a span of three weeks. Thereafter, voluntary engagement and reading interest were measured using procedures identical to those used in previous phases of the study.

Interscorer Agreement and Treatment Integrity

Interscorer agreement was calculated for data collected by the primary researcher and research assistants, all advanced doctoral-level school psychology students. The primary researcher and research assistants had previously completed training in the administration and scoring of oral reading fluency and retell fluency probes as well as coursework in research methodology. Interscorer agreement was calculated for 20% of the reading probes, 20% of the self-reported reading interest questionnaires, and 25% of the voluntary engagement sessions. Agreement was calculated differently for measures of skill and intrinsic interest. For the skill measures (oral reading fluency and retell fluency), a second observer listened to students complete the oral reading fluency and oral retell fluency assessments and independently scored words read correctly and the number of words in each student's retell. Interscorer agreement was calculated by correlating the scores obtained by each of the two observers. Correlations ranged from .926 to .999 (mean = .979) on oral retell fluency and .918 to .998 (mean = .959) on retell fluency. On the voluntary engagement measure, interobserver agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 to yield a percentage. Interobserver agreement was 100% on the voluntary engagement measure. The same procedure was used to calculate agreement on the reading interest survey. A second observer scored 20% of the surveys, and interscorer agreement was 100%.

A second observer—either the primary researcher or a research assistant—collected treatment integrity data for 20% of the treatment sessions. During these intervention sessions, the second observer recorded the presence or absence of a series of

treatment steps (see Appendix B). Treatment integrity data were calculated by dividing

the number of steps completed correctly by the number of steps in the appropriate

condition (i.e., 17 steps in the feedback only condition and 27 steps in the feedback plus

contingent reward condition). Treatment integrity was 100% across all sessions.

Chapter III.

RESULTS

To determine if the treatment conditions differentially affected students' reading performance, voluntary engagement, and self-reported interest, I analyzed data through significant effects using a repeated-measures ANOVA, graphic representation, effect sizes, and gains in students' raw scores. Phases (pre-treatment, immediate follow-up, and delayed follow-up) represented the repeated measure and the treatment condition (intensive instruction with performance feedback only or intensive instruction with performance feedback plus contingent reward) represented the between-subjects variable.

Oral Reading Fluency

A repeated-measures analysis of variance revealed no differences in the oral reading fluency of students in the feedback only and feedback plus reward conditions at the .05 significance level. There was a significant effect on oral reading fluency over time, $F(2, 16) = 10.11$, $p = .001$. Specifically, analysis revealed that there were significant improvements from pre-treatment to immediate follow-up ($p = .001$) and from pre-treatment to delayed follow-up ($p = .000$). However, there were no interactions between time and condition, $F(2, 16) = 1.87$, $p = .19$ or between the conditions, $F(1,17) = .71$, $p = .41$.

Figure 1, a graph of student performance on oral reading fluency, shows that students in both conditions showed similar trends in performance, although students in the feedback only condition consistently performed at a level above students in the feedback plus reward condition. Figure 2 shows the average of students' median oral reading fluency scores in each treatment condition at each phase of the study (pre-
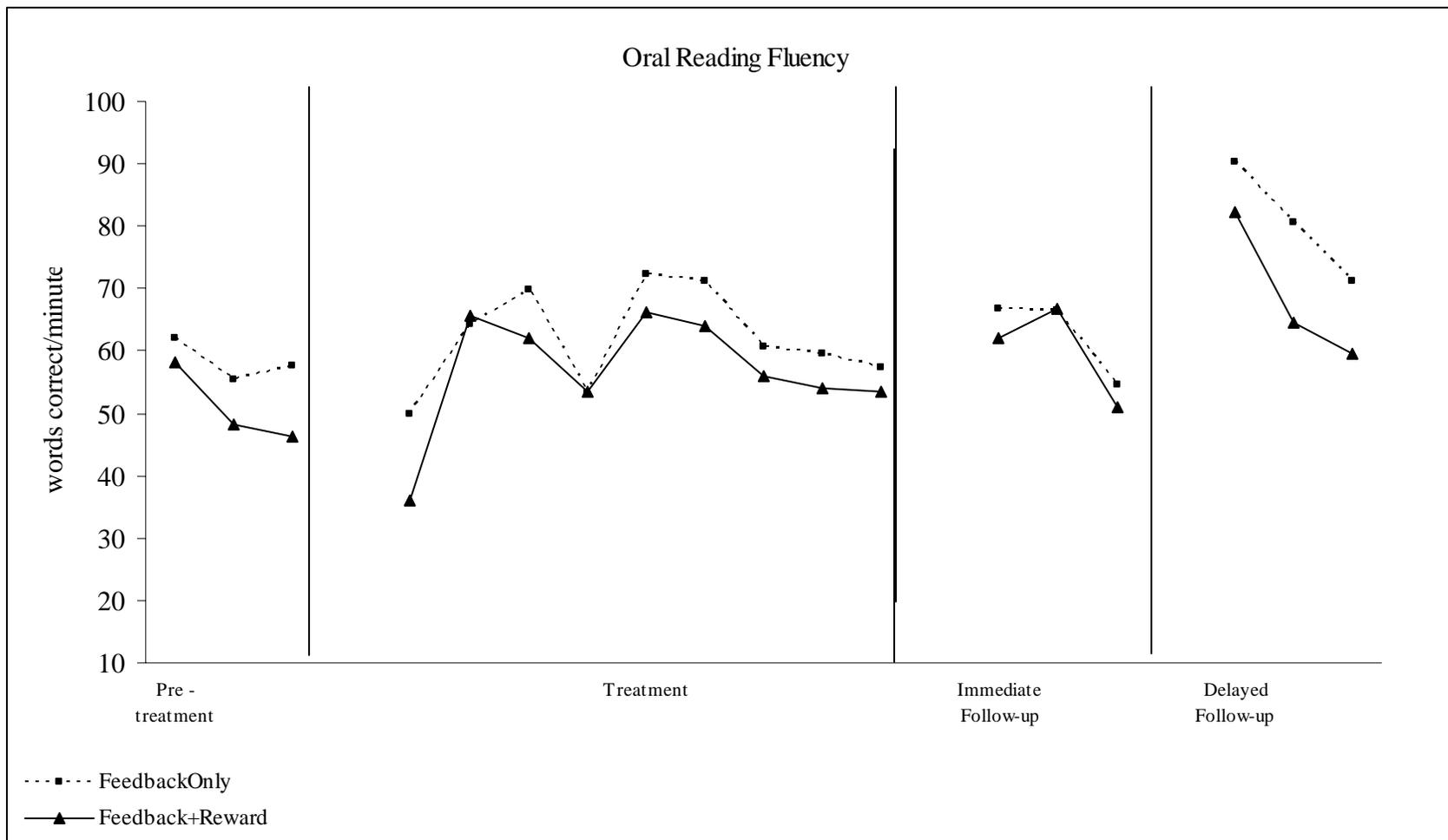
Figure 1. Comparison of oral reading fluency scores across conditions and phases.
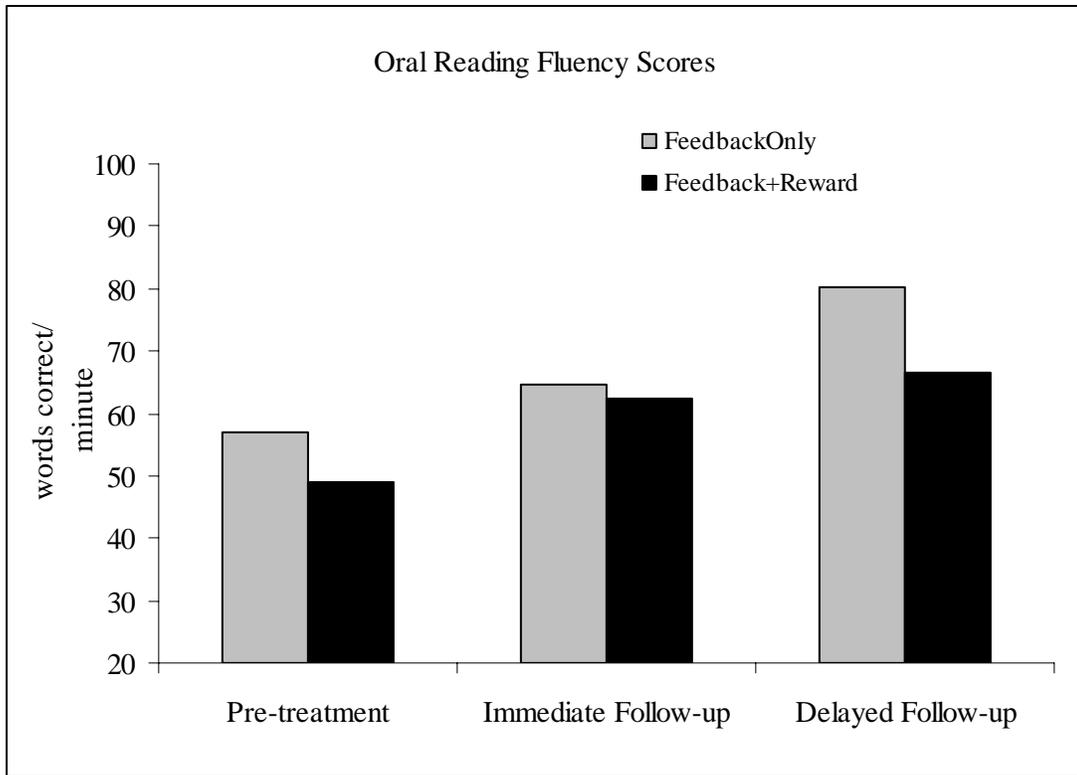
Figure 2. Comparison of students' median oral reading fluency scores across conditions

and phases.

treatment, immediate follow-up, and delayed follow-up). Compared to the feedback only condition, students in the feedback plus reward condition made greater gains from pre-treatment to immediate follow-up. However, from the immediate follow-up phase to the delayed follow-up phase, students in the feedback only condition made greater gains than the feedback plus reward group.

An additional means for analyzing graphically-depicted data is through the percentage of nonoverlapping data points (NDP). To calculate this figure, a researcher records the number of data points in the treatment phase that exceed the highest point in the baseline phase and divides by the total number of points in the treatment phase. (Scruggs, Mastropieri, & Casto, 1987). For the feedback only condition, the percentage of NDP from pre-treatment to treatment was 0.0%, and the percentage of NDP from pre-treatment to delayed follow-up was 100%. For students in the feedback plus reward condition, the percentage of NDP from pre-treatment to treatment was 44% and the percentage of NDP from pre-treatment to delayed follow-up was 100%.

Table 2 lists the means and standard deviations for all of the variables in the current study and Table 3 lists the average student gains across variables, conditions, and phases. On average, from the pre-treatment to immediate follow-up phase, the oral reading fluency scores of students in the performance feedback plus reward condition increased from 49.08 to 62.46 words correct per minute (WCM). The average score of students in the performance feedback only condition improved from 57.11 WCM to 64.56 WCM. On average, students in the feedback plus reward condition made greater gains from the pre-treatment to the immediate follow-up phase; they gained 13.38 WCM compared to a gain of 7.44 WCM by students in the feedback only condition. From the

Table 2. Means and standard deviations for oral reading fluency, retell fluency, voluntary engagement, and self-reported interest by condition and phase.

	Pre-Treatment	Immediate Follow-up	Delayed Follow-up
Oral Reading Fluency			
Feedback Only	57.11(14.36)	64.56(19.43)	80.29(15.36)
Feedback + Reward	49.08(20.71)	62.46(23.61)	66.58(21.39)
Retell Fluency			
Feedback Only	32.00(16.61)	26.44(11.87)	34.29(13.78)
Feedback + Reward	32.15(15.02)	27.54(12.52)	36.42(17.39)
Voluntary Engagement			
Feedback Only	5.00(8.50)	10.63(16.61)	5.00(5.35)
Feedback + Reward	0.50(1.50)	0.56(1.57)	3.75(5.05)
Self-Reported Interest			
Feedback Only	57.56(9.80)	60.00(9.96)	61.00(7.82)
Feedback + Reward	62.40(12.86)	61.22(14.51)	59.58(12.35)

Table 3. Average student gains in oral reading fluency, retell fluency, voluntary engagement, and self-reported interest by condition and phase.

	Pre-Treatment[1]	Immediate Follow-up[2]	Delayed Follow-up[3]
Oral Reading Fluency			
Feedback Only	7.44	12.00	20.71
Feedback + Reward	13.38	3.75	16.83
Retell Fluency			
Feedback Only	-5.56	5.00	1.29
Feedback + Reward	-4.62	8.25	3.33
Voluntary Engagement			
Feedback Only	5.00	-9.17	1.43
Feedback + Reward	0.00	2.78	2.78
Self-Reported Interest			
Feedback Only	0.88	-1.17	1.43
Feedback + Reward	-1.56	-1.44	-3.00

Note. Gains were calculated from the average of each student's individual gains, not the gain across phase means. [1]= from pre-treatment to immediate follow-up, [2] = from immediate follow-up to delayed follow-up, [3] = from pre-treatment to delayed follow-up.

immediate follow-up to the delayed follow-up phase, students in the feedback only group

made greater gains in fluency (12.0 WCM) than the feedback plus reward group (3.75

WCM). Overall, from pre-treatment to delayed follow-up, the feedback only and

feedback plus reward conditions gained 20.71 and 16.83 WCM, respectively.

Effect sizes were also used to analyze data. These were calculated by finding the

difference between phase means and dividing by the standard deviation of the earlier

phase. For instance, when calculating the effect size from pre-treatment to immediate

follow-up, I subtracted the pre-treatment mean from the immediate follow-up mean and

divided by the standard deviation of the pre-treatment mean. Cohen (1988) defines effect

sizes of 0.0 to 0.2 as small, 0.3 to 0.5 as medium, and 0.8 to 2.0 as large. The effect sizes

for oral reading fluency from pre-treatment to immediate follow-up were 0.52 for

students in the feedback only condition and 0.65 for students in the feedback plus reward

condition (see Table 4). For oral reading fluency scores from the immediate to delayed

follow-up phase, the effect sizes for feedback only and feedback plus reward were 0.81

and 0.14, respectively. Overall, from pre-treatment to delayed follow-up, the effect sizes

for the feedback only and feedback plus reward conditions were 1.61 and 0.81,

respectively. Effect size data analysis, using feedback only as the control condition and

feedback plus reward as the treatment condition, indicated that the addition of contingent

reward had a negative effect on oral reading fluency throughout the study. The largest

such effect size was a -0.90 from the pre-treatment to the delayed follow-up phase.

Analyzing student gains at a week-by-week level provided an interesting

perspective of skill gains. From the pre-treatment to immediate follow-up phase, the

average oral reading fluency gain for students in the feedback only condition was 7.44

Table 4. Effect sizes for oral reading fluency, retell fluency, voluntary engagement, and self-reported interest by condition and phase.

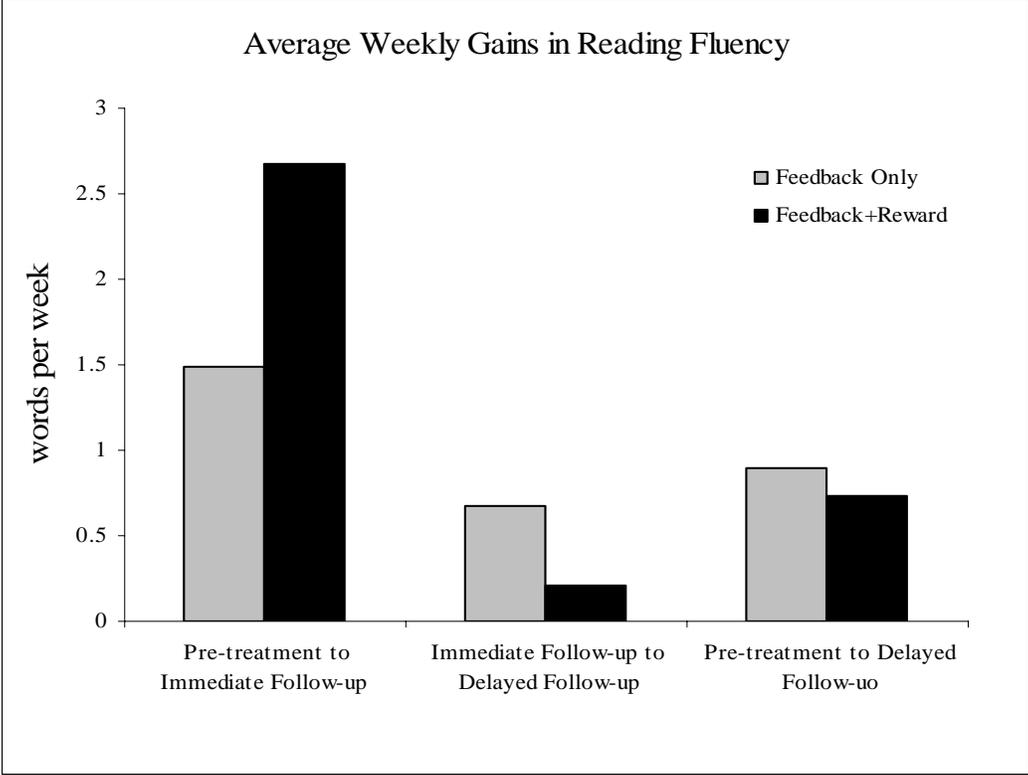|	Pre-Treatment[1]	Immediate Follow-up[2]	Delayed Follow-up[3]
Oral Reading Fluency			
Feedback Only	.52	.81	1.61
Feedback + Reward	.65	.14	.81
Reward Condition		-.11	-.89
Retell Fluency			
Feedback Only	-.34	.66	.14
Feedback + Reward	-.31	.71	.28
Reward Condition	.01	.09	.12
Voluntary Engagement			
Feedback Only	.66	-3.00	0.00
Feedback + Reward	.04	2.00	2.17
Reward Condition	-.53	0.00	-2.34
Self-Reported Interest			
Feedback Only	.25	.10	.35
Feedback + Reward	-.91	-.11	-.22
Reward Condition	.49	.12	-.18

Note. [1] = from pre-treatment to immediate follow-up (Mean immediate follow-up - mean pre-treatment / SD pre-treatment), [2] = from immediate follow-up to delayed follow-up (Mean delayed follow-up - mean immediate follow-up / SD immediate follow-up), [3] = from pre-treatment to delayed follow-up (Mean delayed follow-up - mean pre-treatment / SD pre-treatment).

words over 5 weeks, which was an average of 1.49 words per week. From the immediate follow-up to delayed follow-up phase, the average gain was 0.67 words per week. Overall, from the pre-treatment to the delayed follow-up phase, the average gain was 0.90 words per week. From the pre-treatment to immediate follow-up phase, the feedback plus reward group gained an average of 13.38 words, which was an average of 2.68 words per week. From immediate follow-up to delayed follow-up, the feedback plus reward group gained an average of 0.21 words per week. Overall, from the pre-treatment to the delayed follow-up phase, the feedback plus reward group gained an average of 0.90 words per week (see Figure 3).

According to these data, students in the feedback plus reward condition made greater gains than students in the feedback only condition during the treatment phase (from pre-treatment to immediate follow-up). Within the feedback plus reward condition, students showed greater gains from pre-treatment to immediate follow-up than from pre-treatment to delayed follow-up. This suggests that students who received rewards during the treatment phase made the greatest increases in oral reading fluency when they had access to rewards.

An additional analysis was done to determine if students who earned an above-average number of rewards performed differently than students who earned a below-average number of rewards. The average number of stickers earned for oral retell fluency was 4.23. Students who earned an above-average number of stickers for performance on oral reading fluency exhibited overall gains (from pre-treatment to delayed follow-up) in oral reading fluency, voluntary engagement, and self-reported interest. Students who earned a below-average number of stickers in oral reading fluency also showed overall

Figure 3. Comparison of average weekly gains in reading fluency.

Note. Pre-treatment to immediate follow-up = 5 weeks, immediate follow-up to delayed follow-up= 18 weeks, pre-treatment to delayed follow-up = 23 weeks.

gains in oral reading fluency and voluntary engagement but decreased in self-reported interest. Similar analyses were conducted with students from the feedback only group using the number of times each student showed improvement over the previous day—a figure comparable to the number of rewards earned by students in the feedback plus reward group. In the feedback only condition, the average number of improvements was 4.78 for oral reading fluency. Students who had an above-average number of days of improvement on oral reading fluency exhibited overall gains from pre-treatment to delayed follow-up on oral reading fluency, voluntary engagement, and self-reported interest. Students who had a below-average number of days of improvement on oral reading fluency increased on oral reading fluency but decreased on voluntary engagement and self-reported interest.

Table 5 shows correlations of oral reading fluency with other measures at each phase. Each measure of oral reading fluency (pre-treatment, immediate follow-up, and delayed follow-up) was significantly correlated with the oral reading fluency measure at other phases. This pattern suggests that the measures of oral reading fluency were reliable across the study.

Retell Fluency

The repeated-measures analysis of variance revealed no differences in the performance of students in the feedback only and feedback plus reward conditions at the .05 significance level. The pre-treatment means of the two treatment groups were not significantly different ($p = .78$), and there were no significant changes in retell fluency over time, $F(2, 16) = 2.49$, $p = .11$, no interaction between time and condition, $F(2, 16) =$

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Table 5. Correlations of oral reading fluency, retell fluency, voluntary engagement, and self-reported interest by phase.

	Oral Reading Fluency			Retell Fluency			Voluntary Engagement			Self-Reported Interest		
	Pre	Imm	Del	Pre	Imm	Del	Pre	Imm	Del	Pre	Imm	Del
Fluency												
Pre	1.00											
Imm	.78[b]	1.00										
Del	.60[a]	.83[b]	1.00									
Retell												
Pre	.83[b]	.61[a]	.40	1.00								
Imm	.67[a]	.31	.33	.53	1.00							
Del	.72[b]	.74[b]	.70[b]	.51	.58	1.00						
Vol Eng												
Pre	-.08	-.13	-.25	-.04	.25	.25	1.00					
Imm	.38	.14	.15	.44	.05	-.10	-.11	1.00				
Del	-.87[b]	-.72[b]	-.54	-.69[b]	.70[b]	-.56	.03	-.29	1.00			
Interest												
Pre	-.27	-.46	-.44	.01	-.32	-.61	-.33	.33	.49	1.00		
Imm	-.34	-.36	-.26	-.08	-.48	-.60	-.56	.33	.41	.70[a]	1.00	
Del	.05	.08	.24	.12	-.14	-.22	-.48	.49	-.06	.27	.77[b]	1.00

Note. [a] = Correlation is statistically significance at the .05 level; [b] = Correlation is significant at the .01 level.

.23, $p = .80$, and no difference by condition, $F(1, 17) = .02$, $p = .91$.

Figure 4 illustrates student performance on retell fluency, a measure of reading comprehension, throughout the study. Patterns of performance were similar across treatment conditions with students in the feedback only group slightly, but non-significantly, outperforming students in the feedback plus reward group throughout the treatment phase of the study. Figure 5 shows a comparison of the average of students' median retell fluency scores across phases of the study. Median scores for students in both conditions were nearly identical in the pre-treatment phase, with the performance of students in the feedback only group decreasing slightly more than students in the feedback plus reward group to the immediate follow-up phase. From the immediate to delayed follow-up phase, student in both conditions increased in retell fluency, with students in the feedback plus reward group exhibiting slightly greater gains than students in the feedback only group.

For the feedback only condition, the percentage of NDP from pre-treatment to treatment was 33% and the percentage of NDP from pre-treatment to delayed follow-up was 33%. For the feedback plus reward condition, the percentage of NDP from pre-treatment to treatment was 22% and the percentage of NDP from pre-treatment to delayed follow-up was 33%.

Students in both conditions decreased in retell fluency scores from pre-treatment to immediate follow-up with the feedback only group yielding an average gain of -5.56 (range = -28 to 9) words in their retell and students in the performance feedback plus reward condition yielding an average gain of -4.62 (range = -31 to 18) words. Overall, from the pre-treatment to delayed follow-up phase, students in the feedback only group
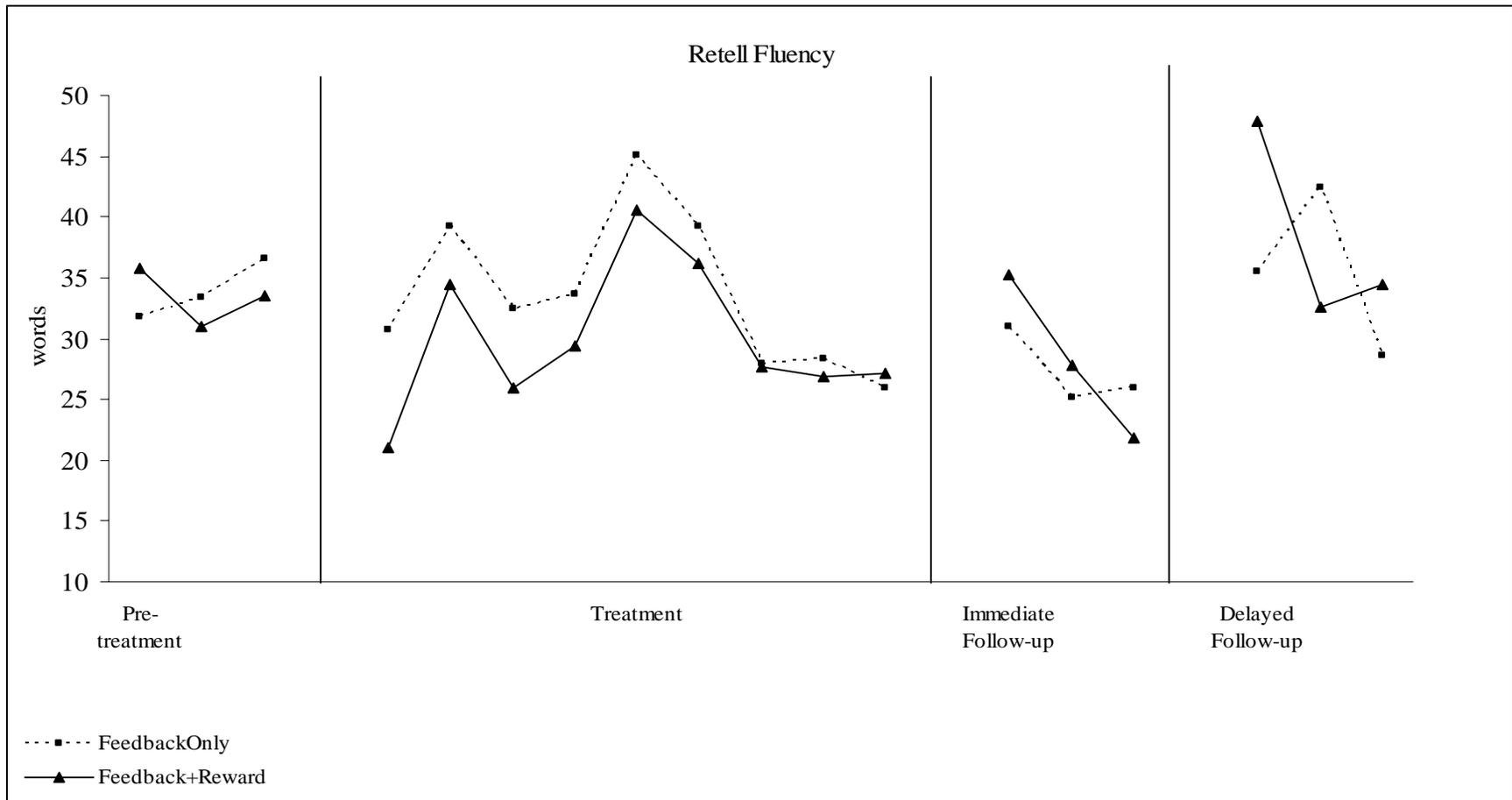
Figure 4. Comparison of retell fluency scores across conditions and phases.
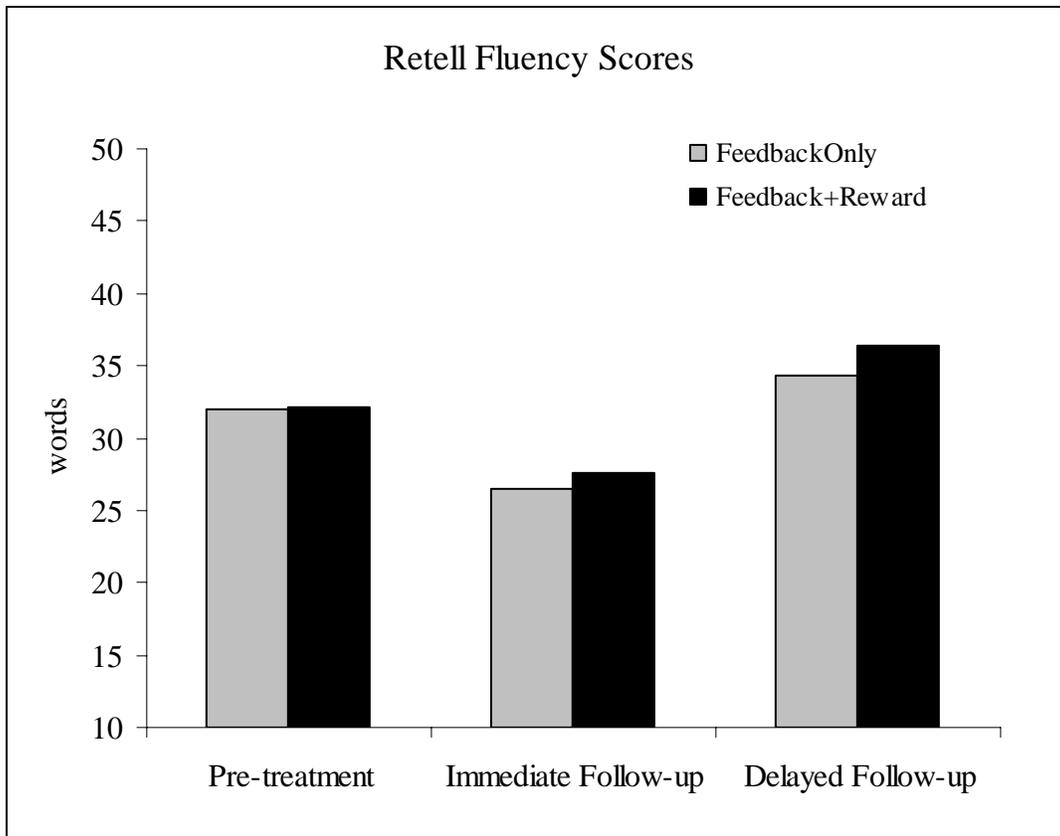
Figure 5. Comparison of students' median retell fluency scores across conditions and

phases.

gained an average of 1.29 words in retell fluency, with the mean increasing from 32.0 to 34.29 words. Students in the feedback plus reward condition increased from 32.15 to 36.42 words, with students gaining an average of 3.33 words in retell fluency.

From the pre-treatment to immediate follow-up phase, the effect sizes for the feedback only and feedback plus reward groups were -0.34 and -0.31, respectively. From the immediate follow-up to the delayed follow-up phase, the effect sizes were 0.66 for the feedback only group and 0.71 for the feedback plus reward group. Overall, from the pre-treatment to delayed follow-up phases, the effect sizes for the feedback only and feedback plus reward groups were 0.14 and 0.28, respectively. Compared to the feedback only condition, the feedback plus reward condition yielded an effect size of 0.12 from the pre-treatment to the delayed follow-up phase.

Students in the feedback plus reward condition earned an average of 3.96 stickers for improvements in retell fluency performance. Students who earned an above-average amount of stickers on retell fluency exhibited overall gains on retell fluency, voluntary engagement, and self-reported interest. Students who earned a below-average amount of stickers showed overall gains on voluntary engagement but decreased on retell fluency and self-reported interest. In the feedback only condition, the average number of improvements was 4.11 for retell fluency. Students who had an above-average number of days of improvement on retell fluency exhibited overall gains, from pre-treatment to delayed follow-up, on retell fluency but decreased on voluntary engagement and self-reported interest. Students who had a below-average number of days of improvement on retell fluency increased on retell fluency, voluntary engagement, and self-reported interest.

Measures of retell fluency at each phase (pre-treatment, immediate follow-up, delayed follow-up) were not significantly correlated with the measures of retell fluency at any other phase; the correlation coefficient for retell fluency in the pre-treatment and retell fluency in the immediate follow-up phases was .53, the correlation coefficient for retell fluency in the immediate phase and retell fluency in the delayed follow-up phase was .58, and retell fluency in the pre-treatment phase and retell fluency in the delayed follow-up phase were correlated at .51.

In general, students' retell fluency scores approximate 50% of students' oral reading fluency score, with retell fluency and oral reading fluency yielding a correlation coefficient of .59 (Good & Kaminski, 2003). These figures (i.e., percentage and correlation) were calculated for both conditions at each phase (pre-treatment, immediate follow-up, delayed follow-up) using the average of students' median scores. For the feedback only group, retell fluency was 56% of oral reading fluency at the pre-treatment measure of skill, 41% at the immediate follow-up measure, and 43% at the delayed follow-up measure. For the feedback plus reward group, retell fluency was 66% of oral reading fluency at the pre-treatment measure of skill, 44% at the immediate follow-up measure, and 54% at the delayed follow-up measure. Compared to every other phase, the smallest ratio of retell fluency to oral reading fluency scores for both groups was in the immediate follow-up phase. In the current study, oral reading fluency and retell fluency scores were correlated at .83 (significant and very large) at the pre-treatment measure, .31 (weak and non-significant) at the immediate follow-up measure, and .70 (significant and strong) at the delayed follow-up measure. Taken together, these results suggest that the immediate follow-up measure of retell fluency may not be a valid measure of students'

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true abilities at that point.

Voluntary Engagement

The repeated-measures analysis of variance revealed no significant differences between the performance of students in the feedback only and feedback plus reward conditions at the .05 significance level. There were no significant differences between group means in the pre-treatment phase ($p = .17$), no significant interaction effect $F(2, 13) = 2.3$, $p = .14$, no significant changes over time $F(2, 13) = 2.9$, $p = .09$, and no significant effect between conditions and phases $F(1, 14) = 2.6$, $p = .13$.

On the voluntary engagement measure, students in the two conditions exhibited contrasting trends. Figure 6 illustrates that students in the feedback only condition showed initial increases in voluntary engagement but by the delayed follow-up phase were engaging in reading at the same level as in the pre-treatment phase. Students in the feedback plus reward condition showed little gains from pre-treatment to immediate follow-up but then increased the amount of time spent reading in the delayed follow-up phase (see Table 3). Students in the feedback only condition spent an average of 5% of intervals engaged in the reading activity in the pre-treatment phase, an average of 10.6% of intervals in the immediate follow-up phase, and an average of 5% in delayed follow-up phase (see Table 2). Effect size data for the voluntary engagement measure are shown in Table 4. Overall, the feedback only treatment yielded an effect size of 0.0 from pre-treatment to delayed follow-up, whereas the feedback plus reward treatment yielded an effect size of 2.20. Although the latter effect size is large, the raw data (i.e., percent of intervals spent voluntarily engaging in reading) suggest that students in both conditions had little intrinsic interest in reading at any phase.
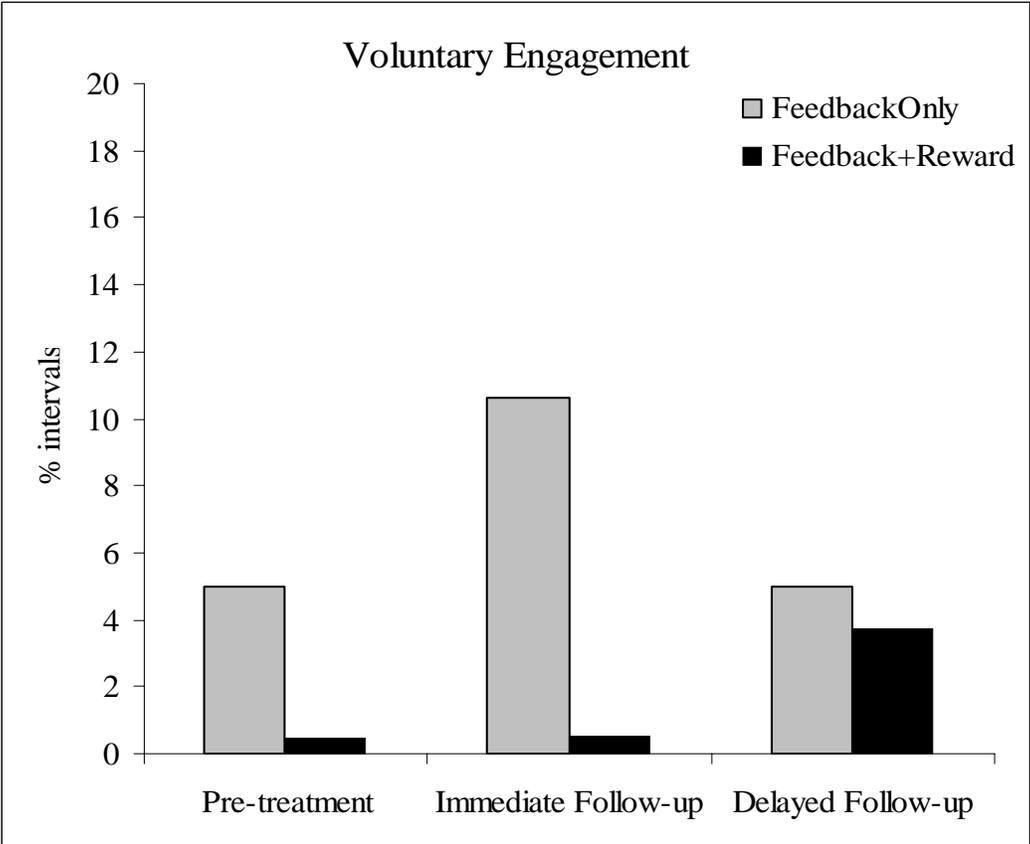
44

Figure 6. Comparison of voluntary engagement across conditions and phases.

Measures of voluntary engagement were not significantly correlated with one another at any phase; measures at pre-treatment and immediate follow-up yielded a coefficient of -.11, measures at immediate and delayed follow-up yielded a coefficient of -.29, measures at pre-treatment and delayed follow-up yielded a coefficient of .03.

Self-Reported Interest

Overall, there were no significant differences between group means in the pre-treatment phase ($p = .8$), no significant changes over time $F(2, 13) = .68$, $p = .53$, no significant interaction effect $F(2, 13) = .14$, $p = .14$, and no significant condition effect $F(1, 14) = .07$, $p = .07$.

On the Elementary Reading Attitude Survey (McKenna & Kear, 1990), students in the two treatment conditions showed opposite patterns throughout the phases of the study (see Figure 7). From pre-treatment to delayed follow-up, students in the feedback only condition showed slight gains in self-reported interest, whereas students in the feedback plus reward condition decreased in self-reported interest. The range of possible scores on the survey is 20-80, with the average 3rd-grade student earning a score between 57 and 58. Mean scores for the feedback only condition increased from 57.56 to 60.00 from pre-treatment to immediate follow-up and then from 60.00 to 61.00 to the delayed follow-up phase. Overall, students in the feedback only condition gained an average of 1.43 points on the survey (see Table 2 for a list of means and standard deviations and Table 3 for a list of gains). Students in the feedback plus reward condition decreased slightly from pre-treatment to immediate follow-up, going from an average score of 62.40 to 61.22. The mean score for this group further decreased to 59.58 in the delayed follow-up condition, with students decreasing an average of 3.00 points overall. The effect sizes
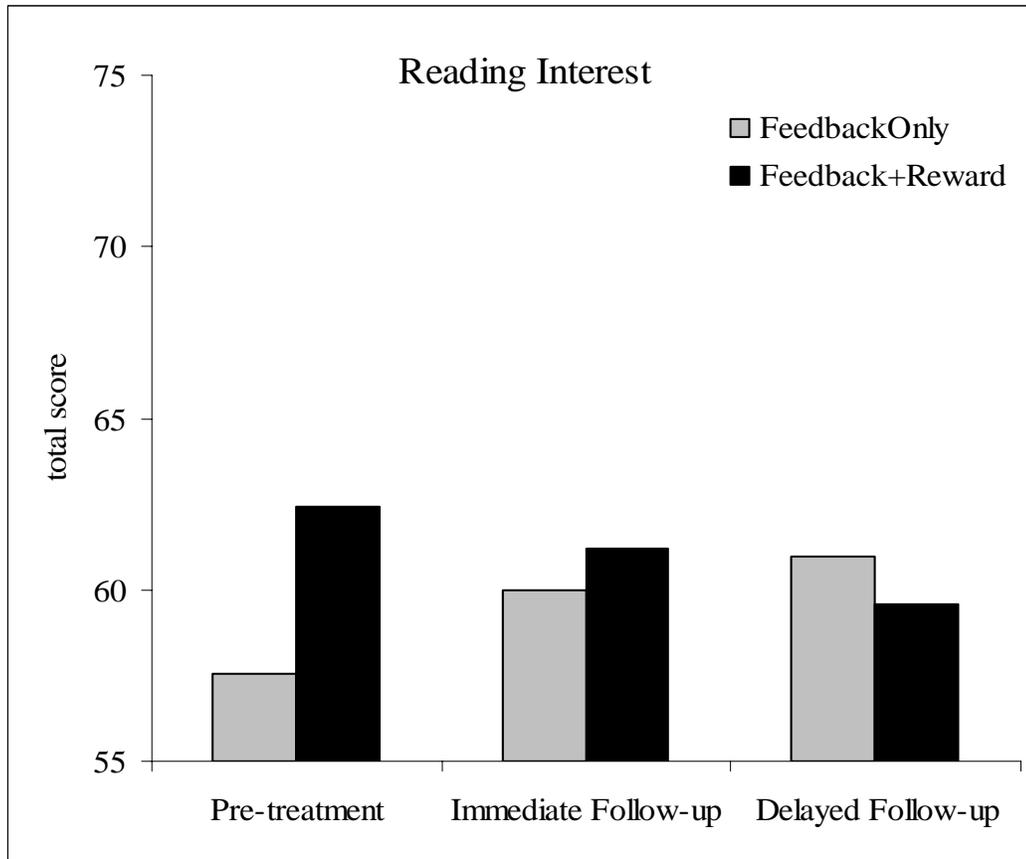
Figure 7. Comparison of scores on the Elementary Reading Attitude Survey across

conditions and phases.

for reading interest are shown in Table 4. For students in the feedback only condition, the overall effect size from pre-treatment to delayed follow-up was 0.35. For students in the feedback plus reward condition, the overall effect size was -0.22. Between the treatment groups, the overall effect size for the feedback plus reward condition was -0.18.

Chapter IV.

DISCUSSION

Overall, the results of the current study suggest that the addition of contingent rewards to conspicuous performance feedback provided little added benefit for students with respect to overall reading skill. On measures of intrinsic interest, results suggest that voluntary engagement and self-reported interest may not be highly related and that these two variables may be differentially affected by the addition of contingent rewards. Results on certain variables (i.e., oral reading fluency, retell fluency, voluntary engagement) suggest the treatment conditions may have differentially affected students' reading skill and intrinsic interest. Some of these findings are consistent with my earlier hypotheses, but others are not.

Skill Gains

Although no statistically significant differences emerged between the two conditions in the area of oral reading fluency or retell fluency, other analyses (e.g., graphic analysis, effect sizes) showed that students in the feedback only condition fared better, making larger gains than students in the feedback plus reward condition. However, there was a statistically significant difference for fluency over time, indicating that students in both conditions generally improved over the phases of the study. The analysis of student gains at a week-by-week level showed that students in both conditions gained the most during the treatment phase (from pre-treatment to immediate follow-up) and that students in the feedback plus reward group made greater gains than students in the feedback only group. This suggests that students in the feedback plus reward condition made greater increases in oral reading fluency when they had access to rewards. This

finding contrasts with several previous studies that found adding contingent rewards to other procedures (i.e., skill- and performance-based interventions) did not lead to additional increases in reading skill (Daly et al., 1999; Eckert et al., 2002).

The average oral reading fluency gain for students in the third grade is 1.08 words per week with a standard deviation of 0.52 (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). From this standpoint, both treatments led to above-average increases, with the feedback plus reward group gaining at a rate over 3 standard deviations above the mean from the pre-treatment phase to the immediate-follow up phase. Students in the feedback only condition gained at a rate approximately 0.79 standard deviations above the mean during the treatment phase. Therefore, both treatment conditions were associated with positive results, although the addition of rewards predictably led to greater short-term skill gains compared to feedback only. These findings are consistent with previous research (Bonfiglio et al., 2004; Chafouleas et al., 2004) showing that combining skill- and performance-based interventions can increase reading fluency.

On measures of retell fluency, inspection of graphs indicates that students in both conditions showed a similar pattern of performance, although the feedback plus reward condition showed slightly greater increases. A main question surrounding this variable is why, under both conditions, retell fluency decreased from the pre-treatment to the immediate follow-up phase but then increased from the immediate to follow-up phase and overall (from pre-treatment to delayed follow-up). A potential explanation is that the immediate follow-up probes of retell fluency were administered toward the end of a week immediately before students' fall break, although this does not appear to have impacted oral reading fluency skills.

Although student performance on retell fluency decreased (non-significantly) from the pre-treatment to the immediate follow-up for both the feedback only and the feedback plus reward conditions (effect sizes -0.34 and -0.31 respectively), the overall effect sizes (from pre-treatment to delayed follow-up) were positive (0.14 and 0.28, respectively). Comparing treatment conditions using the feedback only group as a control, the addition of reward had a slight positive effect throughout the phases of the study: 0.01 from pre-treatment to immediate follow-up, 0.09 from immediate to delayed follow-up, and 0.12 from pre-treatment to delayed follow-up. The small size of these figures precludes a conclusion that either condition was superior at improving students' retell fluency.

Effect of Rewards

An additional issue regarding the efficacy of the feedback plus reward condition is whether the rewards were earned at a rate high enough to impact student performance. The treatment phase took place over a period of 5 weeks with a total of nine opportunities to improve over a previous score. Therefore, the maximum number of stickers a student could earn for each skill was nine. On average, students earned 4.23 stickers (SD = 0.97) for oral reading fluency and 3.96 stickers (SD = 1.38) for retell fluency. During the treatment phase (from pre-treatment to immediate follow-up), students' gains and the number of stickers earned for reading fluency were correlated at .27, indicating a weak relationship. In the treatment phase, the correlation between number of stickers earned and retell fluency was .25, also indicating a weak relationship.

The analysis of students who earned an above- or below-average number of stickers yielded interesting findings. The data indicate that students who earned more

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rewards showed overall improvements on all of the dependent variables. However, students who generally earned fewer rewards still showed increases in voluntary engagement and decreases in self-reported interest whether or not their skill improved.

The comparable analysis of students in the feedback only group produced more variable findings; above-average improvers increased on both measures of skill but differed in terms of the interest measures. Below-average earners increased in skill but again differed in terms of the interest measures. In general, students in this condition improved their skills overall—whether or not measures of interest increased or decreased Considering the findings, one might claim it is possible that rewards—no matter how many or few are received—do not adversely impact voluntary engagement.

Given that stickers or days of improvement depended upon an increase in performance, it is nearly certain that students who earned an above-average number of stickers (or had an above-average number of days of improvement) would increase in performance during the treatment phase. This did occur in the current study, but the above-average students also showed overall increases (from pre-treatment to delayed follow-up) on measures of oral reading fluency and retell fluency. This suggests the possibility of a lasting treatment effect.

Because patterns on oral reading fluency were similar for the above-average factions in both treatment conditions, feedback may have served as a positive consequence for students, even when they did not earn tangible rewards. Students in both conditions who fell into the below-average groups on oral reading fluency gained in skill but the students who received tangible rewards increased in voluntary engagement while the students who received feedback only decreased in voluntary engagement. The fact

that students in the feedback plus reward condition who earned few rewards still showed

increases in voluntary engagement whether or not their skill improved suggests that

receiving rewards, even occasionally, may have made reading a more appealing activity.

Both above- and below-average earners for oral reading fluency and retell fluency in the

feedback plus reward condition increased on measures of voluntary engagement. This

finding suggests that rewards linked to performance did not have a detrimental effect on

voluntary engagement.

Intrinsic Interest

On the measure of voluntary engagement in reading, the treatment groups showed

very different patterns. Throughout all phases, the feedback only group's absolute score

on voluntary engagement in reading was (non-significantly) higher than the feedback

plus reward group, suggesting a higher level of intrinsic valuing of reading. However,

from pre-treatment to delayed follow-up, the feedback plus reward group made greater

overall gains on voluntary engagement compared to the feedback only group, a finding

that is inconsistent with the overjustification effect. The feedback plus reward group's

level of voluntary engagement in reading remained much the same from pre-treatment to

immediate follow-up, although the group showed an increase from immediate to delayed

follow-up, resulting in an overall increase. The feedback only condition increased from

the pre-treatment to the immediate follow-up phase and subsequently decreased to the

pre-treatment level, resulting in a net gain of 0. Although students in the feedback plus

reward condition made greater gains on voluntary engagement overall, they were at a

near-floor level of engaging in reading at the pre-treatment measure of voluntary

engagement, spending less than 1% of intervals reading. These figures suggest that using

contingent rewards may have a slight positive effect on students' voluntary engagement. One possible limitation of the voluntary engagement measure used in this study relates to the task alternatives. Compared to the available tasks (i.e., reading, picture matching, math tasks, connect-the-dots), students chose the connect-the-dots activity a majority of the time—an average of 62% of intervals across treatment groups and phases. Because the attractiveness of a task is dependent upon the alternatives, perhaps the connect-the-dots activity overwhelmed the attractiveness of the reading activity.

On the measure of self-reported reading interest, the treatment groups showed nearly opposite patterns. Although the two groups ended at nearly the same score (feedback only mean = 61.00, feedback plus reward mean = 59.58), the trends were very different. The feedback plus reward group began with higher scores but declined throughout each phase of the study, whereas the feedback only group achieved lower scores initially but increased throughout the phases of the study. These results suggest that students in the feedback only condition generally reported enjoying reading more as the study progressed. Compared to norms on the Elementary Reading Attitude Survey (McKenna & Kear, 1990), the feedback only and feedback plus reward means at the delayed follow-up phase fall at the 61st and 55th percentiles, respectively. Therefore, both groups reported an interest in reading that is slightly higher than other typical 3rd-graders mid-way through the school year.

Why treatment groups performed so differently on measures of intrinsic interest in reading is a perplexing issue. Voluntary engagement and self-reported interest were not highly correlated and in some cases were negatively correlated. At the pre-treatment phase, the correlation between these measures was -.33; at the immediate follow-up phase

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it was .33; and at the delayed follow-up phase, it was -.06. Cameron et al. (2001) found

that when researchers used voluntary engagement as a dependent variable to measure

intrinsic motivation, tangible rewards more often than not had an adverse effect on

voluntary engagement. When self-reported interest was used as a measure of intrinsic

interest, tangible rewards were more likely to show no effect or a positive effect.

Therefore, results of the current study contradict these findings; students in the feedback

plus rewards condition showed overall gains on voluntary engagement, while students in

the feedback only condition maintained their level of voluntary engagement. Results were

quite different for self-reported interest; students in the feedback plus reward condition

declined throughout the study, while students in the feedback only condition increased

throughout.

Overjustification Hypothesis

Although contingent rewards are often used in the classroom for academic and

non-academic behaviors, these practices are seen by some as counter-productive to

motivation. Those who support the overjustification hypothesis assert that if people

receive rewards for an activity that they enjoy, they will be unlikely to engage in those

activities once the rewards are stopped. In this study, however, I found the opposite.

Although not statistically significant, students in the feedback plus reward condition

decreased in self-reported interest throughout the study (when rewards were applied and

after they were withdrawn) and increased in voluntary engagement—slightly when

rewards were applied and when the rewards were withdrawn. Furthermore, students in

the feedback plus reward condition who received the most rewards (i.e., an above-

average number of stickers) increased on voluntary engagement from the pre-treatment to

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immediate follow-up phase and overall (from the pre-treatment to delayed follow-up phase).

An additional issue related to the overjustification effect centers on whether the task (e.g., reading) was interesting to students before rewards were given. According to the self-reported interest measure, students in both groups had an above-average interest in reading compared to their same-aged peers. On the voluntary engagement measure, however, students in both conditions chose reading instead of a non-reading activity a minority of the time in the pre-treatment phase: 5% of intervals for students in the feedback only condition and 0.5% of intervals in the feedback plus reward condition.

Control Versus Competency

Researchers such as Deci et al. (1975) have discussed how feedback or rewards can affect intrinsic motivation by affecting feelings of competence. It appears that, in the current study, students who had the most improvements over their previous scores on oral reading fluency and retell fluency were generally the ones who had the best outcomes in self-reported interest and voluntary engagement in addition to the obvious benefit in skill. However, considering that the average student in the feedback plus reward condition only earned 4.23 out of 9 possible rewards in oral reading fluency and 3.69 out of 9 in retell fluency, most students failed to earn a reward the majority of the time. Furthermore, many students who did earn rewards chose to save them in order to earn a bigger prize (e.g., comic book) as opposed to a small prize (e.g., eraser). To these students (i.e., the ones who did not frequently exchange stickers for backup rewards), perhaps the lack of backup rewards was the more salient part of the contingency and that led to decreases in self-reported interest and precluded higher rates of voluntary engagement.

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Limitations

Due to several limitations, these results must be interpreted cautiously. One

limitation of the current study was the small sample size. An analysis of power revealed

that the sample would have to be nearly four times as large in order to find a significant

difference between intervention conditions. With the size of the current sample, I only

had a 10% chance of finding a significant effect. Therefore, graphic depiction, analysis of

effect sizes, and examination of students' raw score gains may be a better indicator of the

study's importance. In addition to the sample size, there was some attrition throughout

the study. From the immediate follow-up to the delayed follow-up phase, 3 students left

the school—2 from the feedback only condition and 1 from the feedback plus reward

condition. This is characteristic of the transient nature of the student body in the school in

which the study took place. The loss of 3 students may have limited possible data trends,

although averages of students' scores were used in the calculations of graphic depiction

and effect sizes. Only students who had a score for each variable across each phase were

included in the repeated-measures analysis. Another major limitation was the lack of

random assignment. Although treatment conditions were randomly assigned to a

combination of classrooms (to ensure similarly-sized treatment groups), students were

not randomly assigned to classrooms.

Additional limitations include the weak correlations among measures of intrinsic

interest (i.e., voluntary engagement and self-reported interest). In the current study,

students chose to engage in reading a minority of the time, and overall seemed to prefer

the connect-the-dots activity. Because the reinforcement level of an activity is relative to

the options, perhaps the results of the voluntary engagement condition would have been

different if students' options were more similarly appealing. Also, the voluntary

engagement conditions were conducted in the morning, after students had finished daily

reading instruction. Perhaps there was some level of satiation with reading in general—

students had received at least 2 hr of reading instruction, which may have reduced the

likelihood of choosing the reading activity.

Directions for Future Research

Future researchers should conduct similar procedures with larger samples, across

grades and achievement levels. Although this study lacked a true control group (i.e.,

students receiving intensive reading instruction who did not receive any sort of feedback

about performance), the main purpose of the current study was to compare the effects of

feedback only and feedback plus reward. If, however, comparing the treatment groups to

a control group was desired, it would have been highly difficult given the small sample

size and applied nature of the study. Future researchers may want to conduct such a

comparison.

Because students performed inconsistently on retell fluency, I would recommend

using additional measures of comprehension (e.g., questions over the passage) to obtain

additional information regarding the effects of interventions on reading comprehension.

Because feedback appears to be an effective performance-based strategy, additional

strategies (e.g., goal setting) may enhance the effects of feedback (Conte & Hintze,

2000). Future researchers, therefore, should use performance feedback (i.e., graphing)

that incorporates goal lines on graphs for students.

Although the current study was conducted over a period of nearly 30 weeks, with

5 weeks of treatment, I think results might have been more pronounced had higher rates

of rewards been available to students, perhaps one sticker for every unit of improvement (e.g., an increase of 5 words per min = five stickers). These procedures—feedback only and feedback plus reward—seemed to make a greater impact on reading outcomes during the treatment phase when students experienced the most positive feedback and/or rewards. Therefore, a similar study with an extended treatment phase may magnify the results of the current study. Further research should be conducted to determine the optimal conditions for using performance-based strategies such as rewards and feedback. Also, no data were collected that would have allowed for comparison of potential differences between students who saved stickers and those who immediately exchanged stickers for back-up rewards. This could be an interesting comparison for future researchers.

Measures of intrinsic interest in the current study yielded somewhat inconsistent results. For that reason, further research should be conducted on the most accurate ways of measuring intrinsic interest in reading. Future researchers should examine the reliability and validity of voluntary engagement conditions and measures of self-reported interest.

Concluding Remarks

A primary purpose of the current study was to examine whether the addition of contingent rewards had a positive or negative effect on students' reading skill and intrinsic interest. Taken together, the results of the current study are mixed. Although students in the feedback plus reward condition showed considerable gains in some areas (i.e., oral reading fluency) during the treatment phase, other outcomes (i.e., voluntary engagement, retell fluency) increased only after rewards were withdrawn. An additional

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issue is whether information in the form of feedback was a reward in itself. If so, this study is not necessarily comparing rewarded and non-rewarded students. Given that performance feedback and stickers are both extrinsic consequences, this study may actually better differentiate between the effects of tangible and non-tangible rewards.

Despite limitations, the current study suggests that the dependent variables (oral reading fluency, retell fluency, voluntary engagement, and self-reported interest) were affected by the independent variables—feedback only or feedback plus reward. A major question is whether this intervention or a comparable intervention would have similar effects in other settings and with other students. Students in the current study were low-performing readers and exhibited little voluntary engagement in reading. Therefore, these procedures might have different effects if implemented with high-performing students and/or those likely to voluntarily engage in reading.

An additional concern is the practicality of the interventions implemented in this study. Because school policy requires the lowest-performing readers to be monitored once every two weeks (in oral reading fluency and retell fluency) by their teachers, conducting additional reading probes is not an excessive or difficult request. Conducting an assessment of oral reading fluency and retell fluency takes approximately 3 min, with the feedback only or feedback plus reward procedures taking no more than an additional 1 min. Therefore, these procedures take no more than 4 min per student, which is a fairly efficient process given the potential benefits.

Given that all students in the current study were receiving intensive reading instruction, an important factor was whether the addition of contingent rewards to performance feedback procedures would enhance the potency of the instruction. Based on

data from the current study, a performance-based intervention consisting of feedback only may be sufficient to increase students' reading skill and intrinsic interest. For students improving at an above-average pace, receiving feedback plus tangible rewards or feedback only were equally effective in improving their performance. Many researchers (e.g., Daly et al. 1999; Eckert et al., 2000, 2002) have examined the use of brief experimental analysis to determine the most effective combination of interventions for individual students. This consists of implementing each type of intervention in a sequential fashion across stimulus materials, and can identify effective intervention components. Perhaps these procedures could help identify the best combination of skill-based and performance-based interventions for individual students.

Many students who under-perform in reading come from low-income and/or minority backgrounds (Perie, Grigg, & Donahue, 2005). These characteristics were typical of the participants in the current study. These students may have limited access to reading materials at home or may not be encouraged by parents to develop an early love of reading. These conditions are unlikely to produce high intrinsic interest in reading. Students who are low-performing readers, regardless of socioeconomic status, may also have little intrinsic interest in reading. Morgan and Fuchs (2007) conducted a review of 15 studies examining the relationship between reading skill and motivation to read. Results of these studies support the notion that motivation and skill are linked. Several of the studies found that reading skills precede reading motivation; that early differences in skill lead to difference in reading motivation. Several other studies found the opposite; reading motivation precedes reading skill. Although there is not causal evidence for this apparent bidirectional relationship, these results suggest that reading skill and motivation

are related.

Therefore, low-performing readers and students from low-income backgrounds may stand to gain the most from effective reading instruction. The effects of combining rewards with effective reading instruction proved mixed in this study. The data generally suggest that extrinsic, tangible rewards do not have a negative effect on intrinsic motivation and have a positive effect on reading fluency and comprehension.

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APPENDICES

SAMPLE PERFORMANCE FEEDBACK GRAPH

Oral Reading Fluency

y-axis: words correct per minute (0–140)
x-axis: Day
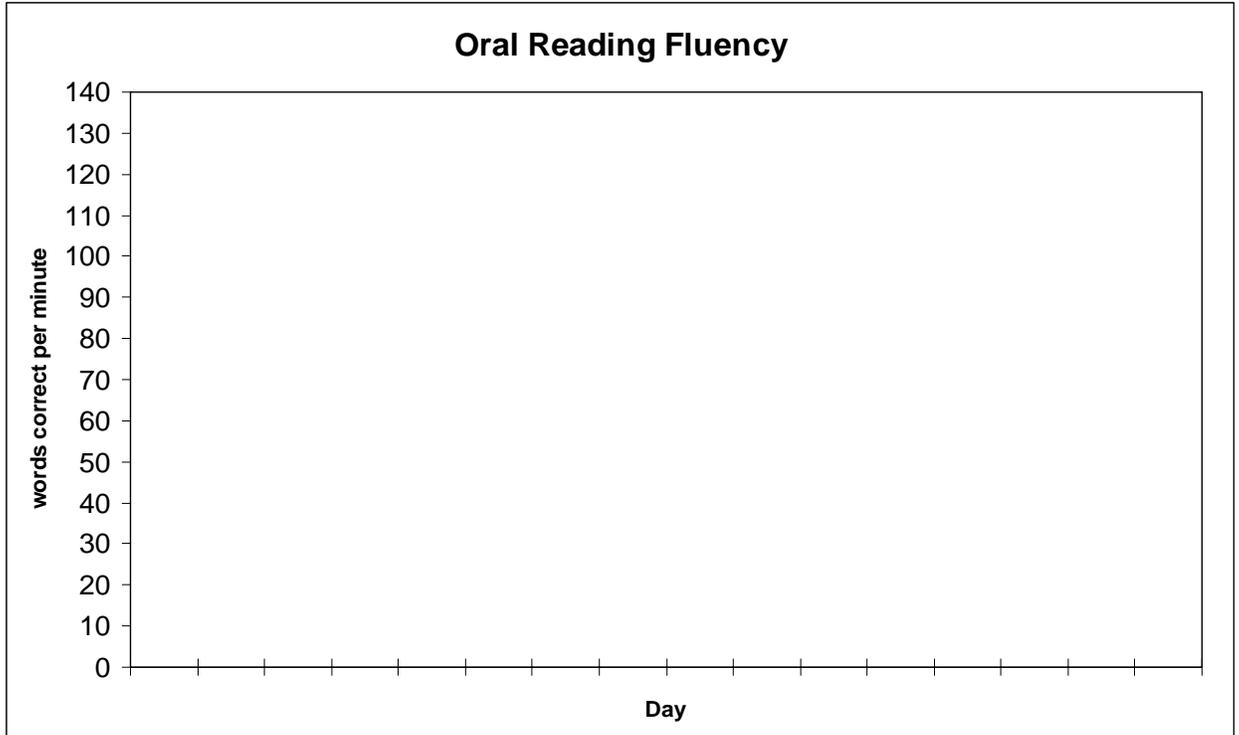
APPENDIX B

TREATMENT INTEGRITY CHECKLIST

Assessment Procedures

1. ____   Take student to quiet area.
2. ____   Hand student an Oral Reading Fluency Probe.
3. ____   Set timer to zero.
4. ____   Read instructions aloud.
5. ____   Tell student to begin and start timer.
6. ____   After one minute, instruct student to stop.
7. ____   Reset timer to zero.
8. ____   Give instructions for Retell Fluency.
9. ____   Tell student to begin and start timer.
10. ____   After one minute, instruct student to stop.
11. ____   Collect probe from student.

Treatment Procedures
Performance Feedback
1. ____   Show student his/her Oral Reading Fluency graph.
2. ____   Tell student his/her Oral Reading Fluency Score.
3. ____   Graph the score.
4. ____   Show student his/her Retell Fluency graph.
5. ____   Tell student his/her Retell Reading Fluency Score.
6. ____   Graph the score.
7. ____   Thank the student and escort him/her back to class.

Performance Feedback plus Contingent Reward
1. ____   Show student his/her Oral Reading Fluency graph.
2. ____   Tell student his/her Oral Reading Fluency Score.
3. ____   Graph the score.
4. ____   If score is an improvement, place a sticker on student's card.
           If score is not an improvement, tell student "*You can do it next time!*"
5. ____   Show student his/her Retell Fluency graph.
6. ____   Tell student his/her Retell Reading Fluency Score.
7. ____   Graph the score.
8. ____   If score is an improvement, place a sticker on student's card.
           If score is not an improvement, tell student "*You can do it next time!*"
9. ____   If the student has earned enough stickers to exchange them for a back-up reward, open the box of rewards and let student exchange stickers for reward.
10. ____   Thank the student and escort him/her back to class.

VITA

Erin Carroll was born in Detroit, Michigan, in 1980. She was raised in Detroit and

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