A Comparison of the Effects of Sustained Silent Reading and Reciprocal Reading on Reading Motivation for Middle School Students with Reading Delays

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A COMPARISON OF THE EFFECTS OF SUSTAINED SILENT READING AND RECIPROCAL READING ON READING MOTIVATION FOR MIDDLE SCHOOL STUDENTS WITH READING DELAYS

by

Margaret Uwayo

A dissertation submitted to the Graduate College in partial fulfillment of the requirements for the degree of Doctor of Philosophy
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Western Michigan University
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Margaret Uwayo
Research suggests that secondary students with reading delays may lack reading motivation, which can be defined as the temporal reinforcement value of texts for an individual. However, reading motivation may be a critical component of their acquisition of reading proficiency. The purpose of the current study was to compare the effects of two research-based reading interventions - sustained silent reading and modified reciprocal reading - on the reading motivation of middle school students with reading delays. Participants were four 6th-grade students who were grouped into dyads in a reading intervention classroom. The primary dependent variable was book engagement under pairing and test conditions. Book engagement was defined as the percentage of time during which participants contacted or manipulated pages of books, made eye movements from left to right and top to bottom on pages of books, flipped pages, and talked about books. The secondary dependent variable was the number of correct responses on a written comprehension check. Reading interventions were 10 minutes of sustained silent reading and 10 minutes of a modified reciprocal reading procedure that included stimulus-stimulus pairing, a yoked contingency, and feedback from a teacher. An alternating treatment design with baseline and a final treatment phase was used to evaluate the effects of the two treatments. Results indicated that sustained silent reading increased reading engagement for two participants and that reciprocal reading increased reading engagement for two
participants. Results are discussed in terms of existing research and extensions to reading
instruction for middle school students with reading delays.

**Key terms:** Reading motivation, reading engagement, conditioned reinforcement, peer yoked
contingency, sustained silent reading, comprehension
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INTRODUCTION

According to the National Assessment of Educational Progress (NAEP, 2017), the reading performance of fourth-grade students in American schools has improved only marginally in a 10-year span. In 2007, the NAEP reported that only 33 percent of fourth-grade and 31 percent of eighth-grade students read at or above the proficient level on standardized reading test, which indicates that they could comprehend grade-level reading content. Ten years later, in 2017, the NAEP reported that 37 percent of fourth-grade students and 36 percent of eighth-grade students read at or above the proficient level, suggesting that there has been little improvement in reading achievement scores in the past decade. The number of children who can read proficiently in elementary school is important because children who cannot read proficiently by at least third grade are more likely to experience continued difficulty in school, are at least four times less likely to graduate from high school and, subsequently, are less likely to obtain profitable employment as adults (Annie E. Casey Foundation; Fiester, 2012; Hernandez, 2012; Kutner, Greenberg, Jin, Hsu, & Dunleavy, 2007). Reading proficiency in elementary school also has a long-term impact on later academic outcomes because it helps students gain foundational academic skills such as comprehension strategies and advanced vocabulary (Guthrie et al., 2004; Roberts, Torgesen, Boardman & Scammaca, 2008). Given the importance of early proficient reading for children’s academic and social success, there is a need to provide effective interventions that can improve the reading outcomes of struggling readers.

Increasing reading motivation is a way to improve reading for children with reading delays (Guay et al., 2010; Roberts et al., 2008). For instance, a seminal reading report published by the National Reading Panel (NRP, 2000) suggested that motivation was an important element for
teaching phonics, vocabulary, and reading comprehension during early childhood (Connors-Tadros, 2014). Other research suggests that reading motivation impacts overall academic success. For instance, Chatterji (2006) reported that young children's preferences for books predicted their reading performance in elementary school. In a statistical analysis of over 19 million students across 39 different countries, the Progress in International Reading Literacy Study (PIRLS) found that there were three main variables correlated with high reading test scores: liking to read, being motivated to read, and having confidence in reading (PIRLS, 2011). Some research suggests that the positive relationship between reading motivation and comprehension occurs because students who are engaged and motivated to read are more likely to apply advanced strategies to understand written texts and, therefore, they can better comprehend the texts (Guthrie et al. 2004).

The current paper seeks to add to the literature on reading motivation by testing two procedures to increase the reading motivation of middle school children. It begins with an overview of national reading performance followed by a brief discussion of relationships between motivation and reading proficiency. This discussion is followed by a brief analysis of cognitive-theory-based research on reading motivation, and a discussion of the major results of those studies including some of their limitations. Next a brief analysis of a behavioral account of motivation, reading, and existing research is provided. Lastly, the current study is described and analyzed in the context of research on reading motivation.

**Literature Review**

**Reading Proficiency, Motivation, and the Struggling Reader**

Struggling readers are students who fail to demonstrate grade-level mastery of reading comprehension and decoding on a measure of reading (Carnine & Carnine, 2010). The NAEP
describes these readers as students who read below a basic level of proficiency (NAEP, 2017). When students struggle with reading decoding or comprehension, they may not enjoy independently reading books which, in turn, decreases the likelihood that they will freely engage with books (Guthrie et al., 2006; Roberts et al., 2008). If they do not have enough engagement with books, then they may have limited practice using comprehension strategies such as making connections or activating background knowledge as well as limited vocabularies (Guthrie, 2013; Peterson, Barrows, & Gift, 2016; Roberts et al., 2008).

As students become older, increasing their reading motivation becomes more challenging because they need more intensive intervention to catch up with their peers (Roberts et al., 2008). Furthermore, since struggling readers may have difficulty reading texts, they may continue to have trouble in other subjects that require comprehension, and are more likely to underperform on standardized measures such as the NAEP assessments and the Common Core Content State Standards because these assessments assume that students have prior reading proficiency (Guthrie, 2013; Lee, 2016; Maurilus, 2018; Peterson et al., 2016). Consequently, a cycle of underperformance ensues in which students who struggle with reading develop a cumulative aversive learning history with reading.

**Theories of Reading Motivation**

Multiple studies on reading motivation have been conducted in the field of psychology. However, for the purposes of the current paper, it is useful to divide the research reviewed in this paper into two broad categories that are distinguished from one another by their theoretical frameworks. The first category is research that has been conducted from a cognitive and social psychological perspective; this research comprises the most literature on reading motivation to date. The second category is research that has been conducted from a behavior analytic
perspective. The current section first examines the theoretical perspective and corresponding interventions within a cognitive psychological framework and then discusses existing research on reading motivation within a behavior analytic framework.

**Cognitive Approaches to Reading Motivation: Extrinsic and Intrinsic Reading Motivation**

Based on the current author’s review of existing literature on motivation, a large majority of research on reading motivation to date appears to be based on cognitive theories of motivation and can be categorized into groups: intrinsic motivation and extrinsic motivation (Schiefele, Schaffner, Moller, & Wigfield, 2012). Schiefele et al. (2012) defined intrinsic motivation as "the willingness to read because that activity is satisfying or rewarding in and of itself” (p. 429). Intrinsic motivation can be activity-specific (relating to the experience of being engrossed in the story) or object-specific (relating to the experience of being interested in the text itself) (Schiefele et al., 2012). Moreover, intrinsic reading motivation, can be further analyzed into subcategories: reading attitude (feelings toward reading), reading related task-value beliefs (the belief, or lack thereof, that the reading task is valuable), and reading related self-efficacy (the internal perception of one's ability, or lack thereof, to read skillfully) (Schiefele, 1999, 2009; Schiefele et al., 2012). Extrinsic motivation, by contrast, can be defined as the "reasons for reading that are extrinsic to both the activity of reading and the topic of the text; readers who are extrinsically motivated are energized by the expected consequences [of completing the task] and aspire to get positive outcomes and avoid negative ones" (Schiefele et al., 2012, p. 429).

Schiefele et al. (2012) reported that there are three methods psychologists use when studying reading motivation: Qualitative methods, quantitative methods, and mixed methods (e.g., Baker & Wigfield, 1999; Greaney & Neuman, 1990; Taboada et al. 2008; Nolen, 2007; Guthrie et al. 1996; Wang & Guthrie, 2004; Wigfield & Guthrie, 1997b). In this research,
qualitative methods may include student self-reports and teacher-student interviews, quantitative methods may employ rating scales such as the Motivation for Reading Questionnaire (MRQ) (Wigfield & Guthrie, 1997), and mixed methods may use students' self-reports to construct questionnaires about motivation. For example, Guthrie, Goa, Wigfield, Tonks, and Perencevich (2006) used reading logs and self-reports to evaluate third graders' reasons for reading books. Similarly, Guthrie et al. (2007) used indirect measures, including interviews, teacher ratings, and motivation self-reports, to assess the specific dimension of motivation predictive of reading comprehension.

In line with these methods of research, some studies have examined the relationship between reading motivation and the use of comprehension strategies. For instance, Cox and Guthrie (2001) compared reading motivation and students' self-reports of how they used reading strategies when reading. They found there was a moderate to high correlation between reading motivation and using comprehension strategies such as prior knowledge or self-questioning. In another study, Guthrie et al. (1996) used interviews of elementary students who participated in a reading intervention program to identify different categories of motivation and the reading strategies with which they were correlated. They found that comprehension strategies such as searching, drawing, and transfer of concepts were highly correlated with components of intrinsic motivation such as self-efficacy, although they suggested that students’ use of comprehension strategies may have been due to the reading intervention that was in place and not intrinsic motivation.

While research on intrinsic motivation may include qualitative methods, some researchers suggest that quantitative methods are used more often. One quantitative method of measurement used to measure both intrinsic and extrinsic motivation has been the MRQ or other similar
questionnaires. On these questionnaires, variables such as the amount of reading, and reading strategies are identified as characteristics of intrinsic motivation while incentives, competition, grades, recognition, and compliance are identified as characteristics of extrinsic motivation. Likert scales are also used to standardize learner responses. Such quantitative measures have been used to modify reading motivation rating scales such as the MRQ. For instance, the MRQ has undergone several revisions since its original conception and has since been used to study other factors related to reading motivation such as curiosity, involvement, and competition (Watkins & Coffee, 2004).

In one study, Andreassen and Braten (2010) used a modified version of the MRQ to measure the relationship between intrinsic motivation, extrinsic motivation, and the use of reading strategies by asking students to read a text and answer several prompt questions (e.g., prediction about the text content, three good questions about the text, explanation of various words, and a summative question). From these responses, they then conducted a correlational analysis and determined that there was a significant correlation between students' use of reading strategies and intrinsic motivation, but a non-significant correlation between extrinsic motivation and reading strategies such as asking questions about a text.

Research also suggests that there is a positive correlation between the amount of reading that a student completes and intrinsic motivation, and negative correlation between the amount of reading that a student completes and extrinsic motivation for completing it (e.g., competition, social rewards, and compliance) (Becker et al., 2010; Durik et al., 2006; Guthrie et al., 1999; Lau, 2009; Wang & Guthrie, 2004; Wigfield & Guthrie, 1997b). For instance, Vansteenkiste, Simons, Lens, Soenens, & Matos (2005) compared the effects of functional texts on intrinsic and extrinsic motivation in a series of studies. During treatment, fifth and sixth grade students were
divided into two groups: the "intrinsic" group, which was told to read a text on nutrition for their own "purposes," and an "extrinsic" group, which was told to read the same text in order to complete a recall test at a later point. The researchers reported that students in the intrinsic group recalled more information than those in the extrinsic group, apparently confirming, as the previous studies found, that intrinsic motivation is what teachers ought to target when attempting to increase their students' engagement with texts.

**Suggested Practices to Increase Motivation**

Based on this research, suggested tactics that teachers ought to employ to increase intrinsic motivation include: 1) making reading relevant, 2) provision of choices, 3) assuring success, 4) arranging for collaboration, 5) emphasizing the importance of reading, 6) organizing thematic units, and 7) integrating multiple motivation supports during instruction (Guthrie, 2013). These practices are based in Concept Oriented Reading Instruction (CORI), which is a treatment package designed to increase components of intrinsic motivation (Guthrie, Wigfield, & Perencevich, 2004; Guthrie et al. 2006; Guthrie 2013). The current study focuses on and describes the first four tactics.

**Relevant Texts.** To create relevance for students, Guthrie (2013) suggests that teachers provide materials on topics that students are interested in reading and that by doing so, they may enjoy reading. To do this, Guthrie (2013) suggests that teachers should use interest inventories to identify students’ “curiosities” and then provide the selected topics (Guthrie, 2013, pg. 9). Other ways of creating relevance may be to use real world materials that are media based (e.g use a newspaper article related to the topic in a social studies classroom), use relevant texts (e.g. connect reading about a vocational activity to applying that service in the community), use poignant topics (e.g. stories that engage students about their own experiences) and project-based
reading activities. Guthrie notes, however, that the use of interesting materials may be limited to free reading or book clubs and may not be applicable to some instruction or curriculum-based reading activities.

*Preferred Books.* A second tactic for increasing students’ motivation is to create opportunities for students to select choice of texts to read (e.g. topics, genres) and provide choices for how they prefer to engage with the text (e.g. overt, covert, with or without peers) (Guthrie et al 2006; Erickson & Fornauf, 2017). The tactic is based on research on Self Determination Theory (SDT) which purports that developing students’ autonomy (freedom to create own personal goals, values, and self-direct one’s own learning) is a powerful way to address motivation (Deci & Ryan, 1985; Erikson & Fornauf, 2017; Guthrie, 2013; Reeve, 1996; Reed, Schallert, Beth, & Woodruff, 2004). Some ways educators may provide choices daily include but are not limited to allowing students to select which story or page to read, select sentences to explain, choose which questions to answer, or identify a goal for the day (Guthrie, 2013).

*Teacher Feedback.* A third motivational tactic that may be used to develop students’ self-efficacy (internal perception of one's ability to read skillfully in reading) is to create opportunities for students to successfully interact with reading (Bandura 1997; Guthrie 2013). For instance, teachers may increase the likelihood of success by ensuring that texts students read match their reading levels, training them on how to create realistic reading goals, and providing feedback about strategies students use when performing reading tasks (Guthrie, 2013).

*Peer Collaboration.* Finally, collaboration with peers may be used to motivate students to read. Some ways to incorporate collaboration may be to: a) use small groups or reading partners during reading activities, b) have peers exchange ideas and expertise, c) use student-led
discussion groups, d) use book talks between peers, e) team projects, and f) peer feedback (Erickson & Fornauf, 2017; Guthrie 2013). Some research-based practices that incorporate collaboration as a key component of reading instruction are read aloud (Whitehurst & Lonigan 1998), book clubs (Raphael & McMahan, 1994; Raphael, Florio-Ruane, & Geroge, 2001), and literacy circles (Daniels, 1994).

*Sustained Silent Reading.* Sustained Silent Reading (SSR) is an intervention based on the self-determination theory that is commonly used in schools to develop students’ attitudes toward reading (Cracken, 1971; Chua, 2008; Hunt, 1970; Yoon, 2002). According to the literature, SSR was developed as a supplemental reading program and is composed of three important parts: “self-selection, role modeling, and no accountability” (McCracken, 1971, pg. 187). Originally, the intervention involved 6 steps that required “rigid” implementation: 1) each student read silently; 2) teacher read silently also thereby providing a model; 3) students self-selected a single book or magazines and teacher helped them choose if it was needed; 4) a timer was used and was kept hidden from students, amount of reading time was increased in small increments, statements of approval were delivered following reading period, and teacher provided choice to “continue” reading; 5) no work was required as function of silent reading; and 6) whole classes and large groups were heterogeneously grouped (Cracken, 1971). Variations on SSR have been implemented in schools including voluntary reading (FVR), drop everything and read (DEAR), daily independent reading time (DIRT), super-quiet independent reading time (SQUIRT), and R5 (Chua, 2008; Gardiner 2001; Garan & DeVoogd, 2008; Kelley & Clausen-Grace, 2006).

In the reading literature, SSR has been widely used to influence students’ attitudes toward reading. Yoon (2002) conducted a meta-analysis that reviewed the 7 of 305 studies that met their selection criteria: (1) an SSR experimental group compared to a control group, 2) enough
statistical information to estimate effect size, 3) published after 1970, and 4) an outcome measure that included reading. The research reviewed in this study showed there was statistical evidence that supported the positive influence of SSR on reading attitudes (Yoon, 2002). In contrast, the National Reading Panel (NRP) reported that there were insufficient experimental studies with control groups for the panel to draw conclusions about the efficacy of SSR (Chua, 2008; Garan & DeVoogd, 2008; NRP, 2000). In a response to this report, Garan and DeVoogd (2008) stated that few educational researchers used experimental methods to determine causality, which may have restricted the number of studies that met the panel’s selection criteria (Garan & DeVoogd, 2008). These and more recent studies (Chua, 2008; Cuevas, Irving, & Russell, 2014) suggest that additional experimental research on SSR is needed to support the use of the practice in schools.

**Limitations of Existing Reading Research**

While studies on intrinsic and extrinsic motivation yield useful information for reading motivation, research on intrinsic reading motivation presents four potential issues that limit its usefulness for behavioral research. First, while there is some consistency on correlations between intrinsic reading motivation and reading performance, there appear to be few operational definitions of motivation in this body of literature. The lack of an operational definition of reading motivation, and its dimensions or constructs, makes it difficult for practitioners to define it when targeting it as a behavior during reading instruction. Second, intrinsic reading motivation is defined as an internal process that includes various constructs such as reading attitudes, value-beliefs, and internal perceptions of competency - all of which are private events that are inaccessible to observers and, therefore, not measurable.

Third, many of the methods used to measure reading motivation rely on rating scales or similar methods. Rating scales, questionnaires, self-reports, and similar measures are subjective
indirect measures of behavior that may produce correlational but not causal information. Thus, there is a need for quantitative, direct measures of behaviors identified as components of reading motivation. Fourth, and perhaps most importantly, although research suggests that intrinsic motivation as an important component of reading comprehension, few studies have tested causal interventions to increase reading motivation. Identifying function-based interventions for increasing reading motivation that are practical and sustainable is important, since the effectiveness of such interventions will need to be understood by practitioners if this research is to have value. In this respect, behavior-analytic approaches may be of benefit.

**Behavior-Analytic Approaches to Reading Motivation: Motivation as an External Event.**

Behavior analysts explain motivation in terms of external events. Skinner (1938) argued that rather than internal states, the causes of behavior were related to environmental events such as deprivation, satiation, and aversive stimulation. He called these motivating events “drive” or “drive conditions” (Skinner, 1938). Skinner also stated that drive is concerned with the relation between size and momentary strength of a response, and that the strength of the behavior itself and not drive should be measured (Skinner, 1938). Several years later, Keller and Schoenfeld (1950) elaborated on Skinner’s concept of the drive in their *Principles of Psychology*, stating that a more precise and behavioral term was an “establishing operation” (Keller & Schoenfeld, 1950, p. 274-280, 374). Michael (1982) later defined the “establishing operation” (EO) as "any change in the environment which alters the effectiveness of some object or event as reinforcement and simultaneously alters the momentary frequency of the behavior that has been followed by that reinforcement” (Michael, 1982, p.150). In this initial definition, Michael used establishing operations (EOs) to refer to both increasing and decreasing effectiveness, which was received with some criticism (Michael 1982). Later, the term motivating operations (MO) was adopted to
refer to the effects of both the EO and AO in a way that distinguished the concepts while maintaining the meanings (Laraway, Snycerski, Michael, & Poling, 2003).

**Application to Reading**

Skinner (1957) defined reading as a repertoire that includes many processes occurring simultaneously including reading comprehension. A simpler and more precise term, he said, was textual responding, which he defined as vocally responding to textual stimuli without any implications of having understood what was read (Skinner, 1957). Skinner also discussed automatic reinforcement of textual behavior, stating that some behaviors are strengthened or weakened by their own products which have reinforcing (EO) or punishing (AO) effects (Skinner, 1957) and not by external consequences. For instance, once a learner has acquired textual behavior (e.g., they can read words), they are likely to emit textual responses in the presence of unimportant textual stimuli such as advertisements or labels even though there are not any consequences for doing so. These automatic consequences can be used to motivate beginning readers to engage with books (Skinner, 1957). For example, a beginning reader may contact automatic reinforcers when they select an interesting book to read. The automatic reinforcers that are present when reading an interesting book then have the effect of increasing the probability of the behavior of looking or responding textually to books in the future (Skinner 1957). Of course, if a student is not yet a reader or is a struggling reader, they are less likely to contact these powerful reinforcers. Nevertheless, Skinner clearly emphasized that learners who have acquired textual behaviors can become motivated to read through contact with interesting or automatic reinforcers.
An Operational Definition for Reading Motivation

Motivation is often equated with the "sustained state strength" of behavior (Skinner, 1957, p. 212). For instance, a student who reads for long periods of time is highly motivated to read while one who rarely reads lacks motivation to read. Skinner used a great analogy for this example: a runner who runs frequently can seem to be highly motivated to run, while an individual who never runs may seem to lack motivation to run. Similarly, when measuring an individual's motivation to read, it is the strength of the behavior that should be measured rather than any internal processes or drives (Skinner 1938, 1957). Skinner further notes that behavior may vary in strength, which means that it may occur at low or high frequencies, short or long durations, and that the strength of occurrence may be the result of different kinds of variables including conditions of reinforcement (Skinner, 1957). In other words, the occurrence of a behavior at a given moment, including textual behavior, is the result of a learning history that includes various establishing and abolishing operations (motivating operations or MOs) as well as various schedules of reinforcement. Based on this, reading motivation may be defined as the temporal reinforcement value of textual stimuli for an individual (Gentilini & Greer, 2019; Laraway, Sycerski, Michael, & Poling, 2003; Michael 1982 & 1993; Skinner 1957). The reinforcement value for reading could then be measured by the moment to moment strength of a behavior using quantitative methods such as rate (how often students engage with books), duration (length of engagement), preference to read when given choice of other preferred stimuli, and preference for a variety of texts (Gentilini & Greer 2019; Tsai & Greer, 2006). In the current paper, the purpose of such an operational definition is to provide a method with which the current experimenter can objectively measure reading motivation. It allows for the measurement of observable behaviors such as textual engagement, duration of engagement, preference as well
as related reading behaviors (types of texts) while eliminating any reference to subjective internal processes.

**Behavioral Practices to Increase Motivation**

One practice that has been used to increase reading motivation is book conditioning, a strategy that is used to condition books and, in some cases, condition books as preferred reinforcers. Research suggests that preference for looking at books is a prerequisite for children’s readiness to read (Dinsmoor 1983; Greer, Dorow, Wachhaus & White, 1973; Greer & Polirstok 1982; Skinner, 1957; Tsai & Greer, 2006). Research has also shown that when books are conditioned for observing responses, children develop positive experiences with books and learn to enjoy looking at and reading books during free time, which has also resulted in faster acquisition of new words when compared to baseline conditions (Greer & Ross, 2008; Neuman, 1999; Tsai & Greer, 2006). Often, children learn to enjoy looking at books incidentally; for example, when caregivers read to them while pointing to the pictures and words in the books (Greer & Ross, 2008). When children have not acquired conditioned reinforcement for books, book conditioning can be implemented as an intervention to establish this repertoire.

There are two major principles involved in the process of conditioning stimuli: classical conditioning and operant conditioning. Classical conditioning is generally defined as learning that happens when associations are formed between pairs of stimuli that occur sequentially in time (Kalat, 2016). Ivan Pavlov (1927) is credited with the development of classical conditioning through his research on salivation and conditioned reflexes in canines. In these studies, he paired food (the unconditioned stimulus) with the tone of a bell (the neutral stimulus) and measured the dogs’ salivation responses. Before pairing, the unconditioned stimulus elicited salivation and the neutral stimulus did not. After repeated pairings, the bell elicited salivation. In
so doing, Pavlov demonstrated that neutral stimuli could acquire the function of the unconditioned stimuli after repeated pairings (Malott & Shane, 2014; Shahan, 2010).

Operant conditioning is generally as defined learning that happens where connections are formed between behaviors and their consequences (Kalat, 2016). Skinner (1938) is credited with operant conditioning. He distinguished it from classical conditioning, in terms of the types of responses therein. Unlike classical conditioning which focuses on reflexes, operant conditioning focuses on “voluntary” types of response. Voluntary responses interact with the environment to produce favorable consequences (conditioned stimuli) and thus, increase the probability of future occurrences (Cumminskey-Moore, 2017; Kalat, 2016). Skinner also proposed that behavior could be analyzed in terms of behavioral chains where each link has two function: As a conditioned reinforcer for the previous behavior and as a signal for the following operant and probability of reinforcement (Cumminskey-Moore, 2017; Malott & Shane, 2014).

In book-conditioning procedures, the principle of operant conditioning is applied when voluntary responses like observing books or reading books, produce favorable consequences such as social approval (Tsai & Greer, 2006). Some tactics that use this principle may be direct contingencies of reinforcement (e.g. social approval contingent on reading engagement behaviors), vicarious reinforcement (e.g. observational learning) and group contingencies (e.g. peer yoked contingencies) (Greer, Singer-Dudek, & Gautreaux, 2006; Gentilini & Greer, 2019). The principle of classical conditioning is applied through stimulus-stimulus pairing wherein books (the neutral stimuli) are paired with a preferred reinforcer such as edibles (the unconditioned stimuli) (Tsai & Greer, 2006). After successful pairing, the books would then function as conditioned reinforcers for the students. Stimulus-stimulus pairing and social reinforcement may be used individually or simultaneously to establish neutral stimuli as
conditioned reinforcers. It is important to note that for students who may have had extensive aversive experiences with books including histories with reading underperformance, books may function as aversive stimuli, rather than simply neutral stimuli.

In tactics that use observational learning, stimuli that were previously neutral acquire reinforcing effects when participants observe peer confederates receive the neutral stimuli while they receive nothing or a much less preferred stimulus (Singer-Dudek, Greer, & Schmelzkopf, 2008). For instance, Singer-Dudek, Oblak, and Greer (2011) established books as conditioned reinforcers through an observational learning procedure for three preschool participants with mild language and developmental delays. Before treatment, books did not function as reinforcers for participants. During the treatment condition, the participants observed a confederate as he or she received a book contingent on a correct response and the participant received nothing for a correct response. Results showed that correct responding to acquisition and maintenance tasks increased for all participants after the observational intervention and that all but one participant met the mastery criterion. The authors concluded that there was a functional relationship between their observational book conditioning intervention and books subsequently acquiring reinforcing effects for acquisition and maintenance tasks for preschool participants. Singer-Dudek et al. (2008) obtained similar results with this tactic.

Stimulus-stimulus pairing (SSP) and social reinforcement have been used as tactics to increase book engagement. To reiterate, SSP is a strategy in which previously neutral stimuli acquire reinforcing effects through repeated pairings with other unconditioned or conditioned reinforcers (Tsai & Greer, 2006). SSP conditioning interventions typically involve two-step pair and test procedures. First, the child is observed during a free play probe to determine whether they engage with books for a predetermined amount of time. If the child does not, then they
receive the conditioning intervention which involves stimulus-stimulus pairing and testing the pairing procedure during free play probes (Buttigieg & Greer, 2015). Tsai and Greer (2006) implemented an SSP procedure with social approval for observing responses and examined its effect on the acquisition of textual responses and choice of book stimuli during free play. Before the conditioning treatment, all participants played with toys but did not look at books. During treatment, participants received edible reinforcers and positive verbal approval comments from adults contingent on book observation during intervals. Results showed that the book-conditioning procedure decreased the number of learn units to mastery criterion for textual responses for all four participants. In other words, the participants' learning rate decreased and their selection and engagement with books during free play increased. The authors concluded that the intervention was effective and that conditioned reinforcement for books may enhance children's learning. Other SSP procedures have demonstrated similar results (Buttigieg & Greer, 2015; Lee, 2016; O’Rourke, 2006).

Peer yoked contingencies (PYC) have been used to establish conditioned reinforcement for books. Yoked contingencies are indirect social contingencies of reinforcement that refer to “conditions in which a couple or pair of individuals have to work or learn together to achieve reinforcement” (Greer & Ross, 2008). In the classroom, a game board serves as an Establishing Operation (EO) for students to win and receive a preselected reward (Choi & young, 2014; Rothstein & Gauthreaux, 2007). The game board is set up in such a way that the students, as a team, compete against the teacher. To move up their game piece, students are required to respond correctly when receiving direct learn units (Rothstein & Gauthreaux, 2007). If they fail to respond correctly, the teacher’s game piece moves up while the student piece does not. If they win, the students receive a reinforcer at the end of the game. Overall, peer yoked contingencies
have been used to induce observational learning (Davis-Lackey, 2005; Gold, 2013, Hawkins, Charnock, & Gautreaux, 2007; Stolfi, 2005), to increase conversational units among peers (Rothstein & Gautreaux, 2007), and to increase reading comprehension (Cuminskey-Moore, 2017; Hill-Powell, 2015).

Only three studies have employed peer-yoked contingencies to establish conditioned reinforcement for books. In one of a series of experiments, Cuminskey-Moore (2017) evaluated the effects of pairing books with peer interaction and a peer-yoked contingency on the acquisition of conditioned reinforcement for books and the reading comprehension achievement scores of 5th grade students. Before the procedure, none of the students demonstrated conditioned engagement during 20-min observations. During the procedure, books were paired with peer interaction such that student dyads engaged in overt reciprocal reading of the same book. After reading together, a peer-yoked contingency was put in place for a derived-relation comprehension task. The dependent variables were a series of tests including 20-min observation probes, derived-responding probes, the Woodcock Johnson III Diagnostic for Reading Battery (WJRB) for vocabulary and comprehension subtests, and the Gray Silent Reading test. The results demonstrated that the pairing and a peer yoked contingency was effective in conditioning the students’ independent reading during 20-min observations. The students’ scores on standardized reading tests (WJRB & Gray Silent Reading test) had also increased. Other PYC procedures have demonstrated similar results (Bly & Greer, 2019; Gentilini & Greer, 2019).

**Limitations of Existing Behavior Analytic Research on Reading Motivation**

While observational learning and book conditioning through pairing have been effective interventions for younger children, there have been few studies in the behavioral literature that have explored the efficacy of book conditioning with elementary or middle school students with
reading delays and still only four studies study have evaluated the effectiveness of peer-yoked contingencies to increase independent book-reading duration. Furthermore, even in the behavioral literature, there have been few studies that measure the effects of book conditioning on both reading motivation and comprehension. While there have been studies that have examined the use of conditioned reinforcement strategies to increase other academic areas such as mathematics and writing (Lee, 2016; Maurilus, 2018), only four studies have conditioned books instead of toys as reinforcers (Tsai & Greer, 2006, Singer-Dudek, Oblak & Greer, 2001; Buttigieg & Greer, 2015; Cuminskey-Moore, 2017).

**Study Rationale and Research Question**

The present study investigated the effects of two interventions, modified Sustained Silent Reading (RR) and Book Club, a modified Reciprocal Reading (RR) intervention, to establish books as conditioned reinforcers for middle school students who had below-grade-level reading performance. Reading motivation was defined as the temporal reinforcement value of textual stimuli for an individual and was measured by observing moment to moment engagement with books during predetermined lengths of time. By using these procedures, this study sought to address two major questions: 1) What are the effects of the two interventions on the book engagement of secondary students? 2) Does conditioned reinforcement for book reading lead to an increase in written retelling of content that participants read?

**METHOD**

**Participants**

*Participant Selection.* Participants were selected from a pool of participants that provided informed consent to participate and for whom books did not function as preferred activities or reinforcers. As part of a pre-selection procedure, prior to baseline the experimenter conducted
two 5-minute test sessions to determine if books functioned as preferred stimuli for potential participants. To begin, the teacher instructed the students to: “Grab a chapter book and silent read at your desks”. A 5-second whole interval recording system was used to collect book engagement data. Participants who did not engage with books at the mastery criterion of least 80% in two 5-minute test session were selected for the experiment (Tsai & Greer, 2006). All four participants met this criterion (e.g. they did not engage with books for 80% of the observed time) except Participant 3 in Dyad 2, who met criterion in the first but not in the second test observation. The participant was selected to continue in the study because she read below more than 3 grades below her grade level and she met criterion during one of the two test sessions.

Participants. Four 6th-grade students participated in this study. Participant 1 was identified as having a specific learning disability (SLO) for math, Participant 2 was identified as having a mild Cognitive Impairment (CI), Participant 3 was identified as having other health impairments (OHI) because of a limited alertness to education, and Participant 4 had reading delays and no disabilities identified. All attended the same remedial reading classroom. Participant 1 and Participant 2 were recruited from the morning class period into Dyad 1 and participant 3 and participant 4 were recruited from the afternoon class period into Dyad 2. Participants were placed in dyads based on their SDQA independent reading levels. (See Table 1)

Setting

This study took place in a public middle school in the Midwest. The school served 736 students and 22% of the school population received reduced or free lunches. The study procedures were implemented in a Special Education remedial reading classroom during a morning class period for dyad 1 (2nd period) and during an afternoon class period for dyad 2.
(seventh period). The reciprocal-reading intervention took place at a carpeted, predesignated area, “Margo’s corner” at the back of the classroom. The participants always sat on the beanbags, and the teacher sat on the bean bags with them or on the floor so that they could always see her. All class periods were 50 minutes in length. In general, the classroom structure included a silent reading or silent writing warm up activity at the beginning of class, followed by a partner Repeated Reading intervention where peers read with partners, provided each other with feedback, and graphed their fluency data, a Direct Instruction (Engelmann, 1980) lesson, and finally, students exchanged points for reinforcers at the end of the hour. On the days the teacher did not teach using DI, she read novels aloud to the participants or had paraprofessional staff implement read aloud while she administered weekly assessments as was needed.

All sessions of the modified Reciprocal Reading (RR) intervention took place at the designated section on the carpeted area in the back of a classroom that contained 16 student desks, one teacher desk and one paraprofessional desk, a small book library, a coffee cart, and shelves where classroom materials were stored (e.g., reinforcers, data collection sheets, curricula). Throughout the study, the teacher and participants sat on the bean bags or on the carpeted floor. During Sustained Silent Reading (SRR) sessions, participants read at their desks. The RR intervention and the test observation that immediately followed it were approximately 17-20 min. The SSR intervention and the test observations that immediately followed it were approximately 15 min long. All intervention RR sessions occurred while traditional instruction was ongoing in front of the room while all SRR session occurred during the “silent reading” part of the entire classroom.
Materials

The experimenter assembled small red book bins for each participant that were labeled with their respective names and that each contained at least four highly preferred books. Similarly, the experimenter created “book bins” for each dyad: A red bin for Dyad 1 and a blue bin for Dyad 2, that were labeled with either the team’s name, if they chose one, or with the participants’ names. The Dyads’ bins contained three copies of the book that each Dyad selected to read. For each dyad, the experimenter used books that were of high interest based on the Multiple Stimulus Choice without Preference (MSWO; DeLeon & Iwata, 1996) assessment and that was at the students’ independent reading levels based on the SDQA. The dyad bins were used during modified Reciprocal Reading (RR) sessions, and the individualized bins were used during sustained silent reading (SSR) sessions.

During RR sessions, the materials that were used were: 1) datasheets comprised of 10 trials for recording participation, use of “pass card”, and listener’s engagement, 2) a whiteboard and marker that was used when the peer yoked contingency was implemented, 3) an iPhone “voice memo” application that was used to record the session, 4) preferred edibles, 5) preferred reinforcers, 6) three copies of the book that was selected by the dyad, 7) data sheets comprised of 60 trials for whole interval recording and food consumption recording, and 8) an “interval” application for whole interval recording. During SSR, materials that were used were: 1) highly preferred books at the students’ independent reading levels, 2) tracking sheets on which participants recorded page numbers read after SSR sessions, 3) data sheets comprised of 60 trials for whole interval recording, and an “interval” recording app. Other materials that were used were 1) inter-observer agreement data sheets and treatment fidelity check sheets, 2) pens, pencils and clipboards, 3) plastic crates where reinforcers were stored, 4) comprehension probe sheets,
5) google drive where data were recorded and maintained, 6) a locking accordion folder where completed datasheets were stored. See Appendices B-G for samples of intervention materials.

**Experimental Design**

An alternating treatments design (Barlow & Hayes, 1979) with a baseline, final treatment phase, and probes were utilized to evaluate and compare the effectiveness of Sustained Silent Reading (SRR) and Book Club, which was a modified Reciprocal Reading (RR) intervention. The experimenter analyzed the data to determine if there were different treatment effects between the two interventions (Kazdin, 1982). If there was a clear difference in data trends between responses during each of the two interventions, then the experimenter concluded that a difference in the effects of the two interventions was observed (Haydon, Maheady, & Hunter, 2010). Treatment phases were counterbalanced across dyads so that Dyad 1 began treatment in the SRR condition and Dyad 2 began treatment in the Book Club condition. Treatment conditions were alternated in an ABABAB sequence until all participants had received at least 5 treatment sessions in each condition. The teacher or experimenter signaled the beginning of each intervention by providing an explicit direction (“We’re going to do book club” for Book Club and “Grab a chapter book and silent read in your seats” for SRR). Different books were also assigned to each intervention.

**Response Definitions and Data Collection Procedures**

There were two dependent variables in the study: 1) Book engagement and 2) reading comprehension. Book engagement was defined as looking at or reading a book for an entire interval without any instances of non-book related events such as looking at other stimuli in the room, lying on tables, turning away from the book, talking about non-book related events, or
engaging in stereotypic behaviors. Reading comprehension was defined as post-reading recall in which the reader writes what they remember by providing correct written responses to two types of questions: 1) written story-retell questions that prompted the participant to describe the section of the book they read during the session, and 2) story-reflection questions that prompted the participant to state what they liked and did not like about the book (Domingo, 2015; Kalmbach, 1968). Sample data collection sheets are available in Appendices H-J.

Whole interval recording was used to measure book engagement during two types of sessions: 1) 10-min intervention sessions during which the treatment conditions were present, and 2) 5-min post-intervention sessions which occurred immediately after a treatment session and during which there were no treatment conditions present. During SSR intervention sessions, data were collected using 10-s whole interval recording. A whole interval of book engagement or observation consisted of the student looking at or reading a book for an entire interval (5s) without distraction. If the student observed the book for an entire 10-s interval without any instances of other non-book related behaviors such as lying on the tables, turning away from the books, talking to about non-book related events, looking at other stimuli in the room, or engaging in stereotypic behaviors, then a plus (+) was recorded for that interval. A plus was also recorded if the students finished reading a book and selected a new book during an interval if: there was no passivity, and no other stimuli were chosen. If the student turned away from the book or engaged in behavior that was not related to books (stereotypy, talking to others, or picking up other stimuli), then the response was recorded as a minus (-) for the interval.

During RR intervention sessions, data were collected using 10-s whole interval recording. However, in these sessions, the teacher also collected data on the following four behaviors: A) reading aloud during an entire interval, b) use of the “pass card” during an interval, c) picking up
where a peer stopped reading independently, and d) the number of words read incorrectly during each interval. During these sessions, a plus (+) was recorded if the participant read aloud during an interval regardless of any errors that were made. If the participant chose to use a “pass card,” a minus (-) was recorded for that interval. If the listening peer in the dyad picked reading where their partner stopped, a plus (+) was recorded for that interval. If the teacher or partner had to show them where they stopped reading, and a minus (-) was recorded. During each interval, the teacher indicated the reader by writing their name next to the appropriate paragraph in her copy of the book. As the participants read, the teacher recorded reading errors by marking a slash (/) through the word read incorrectly.

For test sessions that occurred immediately after all treatment sessions (SSR and RR), data were collected on two behaviors during 5-min test observations: A) engagement with books, and B) choice of book selected (e.g., chapter book or picture book). During these test sessions, 5-s whole interval recording was used: a plus (+) was recorded if the participant read the book for an entire 5-s interval without any instance of other non-book related behaviors such as looking turning body away from the book, around at other stimuli in the classroom, talking with peers, and talking to about non-book related events. If the participant turned away from the book or engaged in behavior that was not related to books, then the response was recorded as a minus (-) for the interval. The participant’s choice of books was recorded by circling “chapter book” or “picture book” on the datasheet at the end of the test session.

Additionally, during the RR condition, a research assistant observed the listener in the Dyad and collected data on the listener's book engagement while the partner was reading, and if the listening peer consumed edibles at any time during the 1-min interval when their partner was reading. The research assistant recorded a plus (+) for the interval if the listener looked at the
book for an entire 10-s interval without any instance of other non-book related behaviors such as looking turning body away from the book, around at other stimuli in the classroom, talking with peers, and talking to about non-book related events. If the listener turned away from the book or engaged in behavior that was not related to books, then the response was recorded as a minus (-) for the interval. To record food consumption, the observer circled yes (1) or no (0) to indicate if the listener ate or drank at any time during the 1-min interval during which the partner read. See Appendices E-F for sample data collection sheets.

Reading Comprehension. The second dependent variable for this study was reading comprehension, which was measured using written reading checks. During the probes, participants completed four reading checks that required written responses. The written responses were scored using a rubric that measured six areas: 1) characters, 2) setting, 3) plot, 4) details about what the student liked about the story, 5) details about what the student disliked about the story, and 6) prediction of events in the remaining story. To grade the reading checks, the experimenter developed a modified rubric (Idol, 1989a) which was used to score each question with a value of 1 (yes) or 0 (no).

Interobserver Agreement (IOA) and Treatment Fidelity

Interobserver Agreement. IOA was obtained during 92% of treatment and test conditions assessed. A trained research assistant (RA) recorded students’ responses simultaneously with the teacher or the experimenter during treatment sessions and test observations. The IOA scores were calculated by dividing the total agreements by the total number of agreements plus disagreements and then multiplying that number by 100%. Agreement occurred when the RA’s data for a session matched data collected by the teacher or experimenter (Singer-Dudek et al.,
Mean IOA was 95% during treatment conditions (range, 80-100%), 92% during test conditions (range, 82-100%) and 100% during comprehension probes.

*Treatment Integrity.* Treatment integrity data were collected during 79% of all intervention sessions. An independent observer scored treatment integrity by using a task analysis that listed the steps in each treatment condition. Treatment integrity was calculated by dividing the number of actual steps completed by the number of total steps possible and then multiplying by 100%. The mean fidelity scores were 97% (range, 92-100%).

**Procedures**

*Reading and Preference Assessments.* Before baseline, the experimenter administered four reading assessments for each participant to determine their reading preferences, reinforcer preferences, and reading levels: 1) A written multiple choice and short answer preference assessment for books and edibles, 2) A modified Multiple Stimulus Without Replacement (MSWO) preference assessment of book choice, 3) the San Diego Quick Assessment informal reading inventory (SDQA; LaPray & Ross, 1969), and 4) probes that tested for the participants’ engagement with books prior to the intervention.

*Preference questionnaire.* All participants completed a four-part, multiple-choice questionnaire that provided their preferences for books, edibles, social, and tangible reinforcers. Part I of the assessment prompted participants to select their preferred choice of books. For each book choice, its title, brief description, and a picture of the cover of the book were listed on the assessment. The assessment was administered group for the entire classroom. During administration, the experimenter read each question out and prompted students to select their choices. After the questionnaire was completed, the experimenter reviewed it and probed for
more detailed responses (e.g., “What kind of chips do you like?”) where it was missing. The data collected from the questionnaire was later used during treatment.

_Book Choice Assessment._ A Multiple Stimulus Without Replacement (MSWO) preference assessment was administered for each participant individually to determine a hierarchy of high-interest books that were at the participants' independent reading levels. During the assessment, participants were provided with a total of 12 book choices, and then a final choice between the top three high-interest books. To begin, the experimenter placed four stacks of books of each with at least 4 books (e.g., sports, animals, science fiction) on a desk in front of the participant. Next, the experimenter allowed the participant to look through each stack, picking up and looking at each book in the stack for approximately 30-s. After looking at each book in all four stacks, the participant was instructed to choose the “number 1” book they were interested in reading the most from the array. Once the child chose a book, it was removed as an option, and the experimenter instructed them to choose the next “number 1” book they were interested in reading. The experimenter recorded the child’s most to least preferred book using a scale of one (most preferred) to three (least preferred). This process continued for book set 1, 2, and 3. At the end of the assessment, the participant was instructed to choose the most preferred book from the three that had the highest scores. The experimenter used these data to create four individualized book bins for each participant and one bin for each dyad.

_San Diego Quick Assessment (SDQA)._ The SDQA (LaPray & Ross, 1969), an Informal Reading Inventory (IRI), was also administered to measure the students' abilities to recognize and read sight words out of context. The assessment was composed of a list of sight words sequenced from preprimer to twelfth grade. It allowed the evaluator to detect reading errors and assign an approximate grade reading level as either independent (high accuracy reading level),
instructional (challenging reading level), or frustration (difficult reading level) based on the number of errors made (LaPray & Ross, 1969; Schumm, 2006, see also glossary of reading terms pdf). The results of the SDQA were used for leveled reading and dyad placement. All textual materials used during the intervention were at the participants’ independent reading levels, defined as the highest level at which a reader can read quickly with minimal errors and without help and within their Lexile reading levels (University of Utah Reading Clinic, 2017).

**Pre-baseline.** First, the teacher was required to read the procedure scripts for the two reading interventions. Then the experimenter modeled implementation of RR with students in a non-participating class period. After the model, the teacher implemented RR, and the experimenter provided feedback until the teacher demonstrated 100% mastery as measured by a procedural checklist (See Appendix A). After training was mastered, the teacher implemented the first experimental session of RR and fidelity data were collected. The teacher and research assistant were said to have met mastery if they scored 100% during an inter-observer agreement check that was conducted by the experimenter. After the start of the study, the experimenter met with the research assistant, and teacher for 15-20 min weekly feedback sessions to review data collection procedures for each treatment condition. The experimenter delivered feedback individually if there was a decrease in treatment fidelity or IOA. Additionally, the experimenter conducted IOA checks the following day after the meeting, as a control measure for observer drift.

**Baseline.** The purpose of this condition was to test if books functioned as conditioned reinforcers for participants by measuring their engagement with books before the interventions. Book engagement was assessed by measuring book selection, book continuation, and book engagement during a 10-min observation. First, book selection and continuation (steps 1 and 2)
were measured during each of four 5-min sessions. Next, book engagement was measured during 10-min sessions that occurred once before, during, and post-intervention.

**Step 1: Book selection.** The experimenter placed a “math worksheets” folder and two preferred books on a student’s desk. The books were at the child’s independent reading level. Next, the experimenter said: “You can read or work on math worksheets. Which do you prefer?” If the student chose the “math worksheets” folder, then the experimenter recorded a minus (-) for book selection and started a 5-min timer. After 5-min, the experimenter told the students “You’re all done, you can go back to group work” and then removed the math folder. If the student chose to read the books instead of doing math worksheets, the experimenter recorded a plus (+) for selecting books, set a 3-minute timer, and then recorded the number of intervals during which the participant demonstrated book engagement for 3 minutes. Students who chose books were then given a book continuation test, as described in Step 2. A book continuation test was not implemented if the participant chose math worksheets instead of books during Step 1.

**Step 2: Book Continuation.** After 3 minutes of reading, students who chose books during Step 1 were then given a book continuation test to determine if they would continue to read books when given a choice. To conduct the book continuation test, the experimenter said, “You can keep reading or put the book away” after 3 minutes of reading. If the student chose to keep reading, the experimenter recorded a plus (+), started a 2-min timer, and then continued recording the number of intervals during which the student demonstrated book engagement. If the student chose to put the book away, the experimenter told the student to remain in his or her seat for a few minutes, reset the timer for 2 minutes, and then told the student that the session was complete after 2 minutes.
Step 3: 10-min book engagement probes. After two sessions of book selection (step 1) and book continuation (Step 2) tests were conducted, book engagement sessions were conducted. The purpose of book engagement tests was to determine the amount of time that participants engaged with books before the intervention. All students participated in book engagement tests regardless of their book selection and book continuation behaviors. The book engagement sessions were identical to normal classroom procedures except that sessions occurred for a consistent amount of time daily. Each session of book engagement was 10 minutes, and four sessions were conducted with the entire class; data were only collected for each of the four participants. The teacher, primary experimenter, and research assistant were present during these sessions, each observing a preassigned participant. The experimenter sat at the teacher’s desk which was located in the front far left side of the room, the RA sat at the paraprofessional’s desk which was located at the far right side of the room, and the teacher worked from behind her standing work desk, in the front right side of the classroom. To begin a book engagement session, students were seated at their desks, and the teacher said, “Grab a chapter book and silent read at your desks.” Participants had 1-minute to choose a chapter book from any of the books available in the classroom. Five seconds after all participants were seated at their desks with a book, the experimenter, a teacher, and the research assistant began recording book engagement using 10-s whole interval recording. Each session ended after 10-minutes by the teacher instructing participants to “Put your books underneath your desks and grab your DI folders. I will know you have your worksheets on your desks.”

Modified Sustained Silent Reading (SSR). SSR consisted of 10-minute sessions during which participants independently read high-interest books (Cracken, 1971). The majority of SSR intervention sessions were conducted by the participants’ classroom teacher, and all sessions
were conducted in the students’ classroom while they were sitting at their individual desks.

Before the first SSR session, the teacher instructed the participants in each dyad to choose one book from their individual bins, explaining that they would continue to read this book each time it was silent reading time. Next, the teacher trained the participants on the procedures to follow during SSR sessions. Specifically, students were told that when the teacher said “Grab a chapter book, and silent read in your seats,” they should: 1) pick the book that they selected for SSR, 2) open the book to the page where they would begin reading (e.g., the page after the last page they finished), 3) record the starting page number on their tracking sheet, 4) read silently for 10 minutes, and 5) record the page number where they stopped reading for the day on their tracking sheets. Following this, participants could follow the procedures independently without further training. All four participants selected different books to read during SSR condition.

To begin the first SSR session, the teacher indicated that it was SSR book-reading day by calling the students over to the far corner where their book bins were stored on a bookshelf and asking them to write the “start” page number on tracking datasheet that was placed in their selected book in the bin. After the participants filled in the document and collected their book, the teacher implemented silent reading with the entire class(es) of six to eleven students. To begin, the teacher instructed the entire class to “Grab a chapter book and silent read in your seats.” Once the participants were seated at their desks, the experimenter, teacher, and research assistant began recording book engagement using 10-s whole interval recording. After 10-min, the teacher called the participants over to their bins and instructed them to record where they stopped reading on the progress tracking datasheet (e.g., writing “I read pages 5-7”). Immediately after this, the teacher conducted the 5-min test observation by telling only the participants to “Grab a different chapter book and silent read in your seats.” Once they were
seated at their desks, the experimenter, teacher, and research assistant began recording book engagement using 5-s whole interval recording. After 5 minutes, the teacher terminated the session by instructing the class to “Put your books underneath your desks and grab your DI folders. I will know you’re ready when you have your DI sheets on your desks.”

**Modified Reciprocal Reading (RR): High interest & choice + reciprocal reading + SSP + yoked contingency (Book Club).** The modified Reciprocal Reading (RR) intervention was the second intervention compared in this study. Modified RR was a treatment package comprised of four components: 1) reciprocal reading within dyads, 2) stimulus-stimulus pairing (SSP), 3) a choice of high-interest books to read during each session, 4) and a peer yoked contingency. The treatment package was called “Bookclub.” During this condition, the teacher indicated that it was “book club” day by calling the dyad over to her desk where the assorted prizes and edibles were stored in two separate crates. Then, she instructed the dyad to “Choose a snack and a prize, then go to sit at the bean bags for book club.” The teacher allowed them approximately 2 minutes to make their choices, then followed them to the predesignated area.

**Pre-intervention procedures.** Book club began by helping participants choose their first book before the first intervention session. The teacher helped participants choose their first book by randomly selecting a book for them to read. She began this process by instructing each student in a dyad to select a book from their individual bin that they would like to read with their partner. Once each student selected a book, the teacher instructed them to write the book title on a small piece of paper, fold the paper and put the paper in a bin. Then while the participants watched, the teacher closed her eyes and picked one of the papers from the bin. The title that was selected was the book that was used during all book club sessions or until the dyad finished the book. If they finished the book before the intervention was completed, the teacher repeated the
book selection process. Using the selected book, three copies were printed, labeled with the participant and teachers names and stored in the dyad’s bin. A small whiteboard that the teacher used to deliver points during the PYC and two red cards that the participants could use as “pass cards” were also stored in each dyad’s bin.

Immediately following book selection, the teacher used a modified Behavior Skills Training (BST) procedure to teach the students turn-taking when reading with a peer. The teacher used three books that were already present in the classroom and taught the participants how to engage in reader and listener behaviors, how to earn points and win, how the teacher would earn points, and how to use red cards as “pass cards” if they did not want to read once when it was their turn. After explaining and modeling the process, the teacher required the students to practice reciprocal reading using 1-min reading intervals, delivered feedback, answered questions as needed until they demonstrated 100% mastery. The day after mastery criterion was met, the book club intervention was implemented.

Intervention Procedures: Book club sessions were 10 minutes each, and each student in a dyad received a total of five 1-minute opportunities to read during each session. The intervention steps were: 1) choice of reinforcers, 2) reciprocal reading, and 3) a peer yoked contingency. The teacher conducted book club sessions in a predesignated carpeted area where a colorful poster indicated that space was “Margo’s Corner.”

Step 1: Choice of reinforcers. First, participants selected a preferred prize from a prize bag and preferred snacks for book club. The preferred prize was used as a reinforcer after completion of an intervention session. Preferred snacks were to be consumed while listening to a peer read. After selecting reinforcers, the teacher instructed the students to go to the carpeted area, or “Margo’s corner,” where they sat on bean bags.
**Step 2: Reciprocal Reading.** To start a book club session, the teacher said: “Let's start our book club. When the timer rings, I will call on someone to read. Remember all the rules: 1) you will take turns reading for 1 min, 2) I will randomly call on you to read when it’s your turn, 3) you will earn a point for your team when you read, 3) follow along when your partner is reading, 4) You can use your “pass” card one time during each session, 5) I will get a point if you choose to “pass” and I will get a point if you don’t know where to start when it’s your turn to read, 6) the team with the most points will win at the end and get to keep prizes, 7) you can eat and drink while we’re reading.”

After the instructions, the teacher placed a small whiteboard in front of the participants so that they could see the points they earned after each reading. Then she started the iPhone voice memo audio recorder, started a 1-min timer, and called on the first student to read. If a student chose to read when it was their turn, a plus (+) was recorded on a datasheet. If a student chose to use their pass card so that they did not read, a minus (-) was recorded on a datasheet. Data were also collected on how well participants followed along with their peer by recording a plus (+) on the data sheet if the participant independently started reading where the peer stopped, and a minus (-) if they did not. Additionally, the teacher tracked students’ reading errors by marking a slash (/) through each word they read incorrectly on her own copy of the book. If a participant chose to “pass,” the teacher read instead, marked a minus (-) on her data collection sheet, and then called on the next participant after one minute of reading. At the end of the session, the teacher gave one statement of praise for on-task reading behaviors. The teacher also corrected reading errors by accurately reading any words that the dyad had read incorrectly and then requiring the dyad to repeat the words.
Step 3: Peer yoked contingency. A peer yoked contingency (PYC), defined as an indirect social contingency “in which a couple or pair of individuals have to work or learn together to achieve reinforcement,” was set up and implemented as an establishing operation for book engagement (Greer & Ross, 2008). Before book club, the teacher wrote “Teacher” at the top of a column and “Team” at the top of another column on a whiteboard and then placed it in front of her on the bean bag or on the floor where she was seated with the students. If both members of a dyad read aloud and followed along while their peer was reading, then the teacher marked one point on the board under the “team” column at the end of a reading exchange (e.g., after each member of dyad read aloud). If either or both members of a dyad chose to “pass” or failed to start reading where a peer stopped reading, then the teacher marked one point on the board under the “teacher column” at the end of a reading exchange. The Dyad was considered the winner of the game if they had more points than the teacher at the end of the session. If the teacher had more points at the end, she was considered the winner of the game. Dyads could collect their prizes at the end of the class session. Immediately after book club, the teacher conducted a 5-min test observation by telling the participants to “Grab a chapter book and silent read in your seats.” Five seconds after all participants were seated at their desks with a book, the experimenter, a teacher, and the research assistant began recording book engagement using 5-s whole interval recording. After 5 minutes, the teacher terminated the session by instructing the class to “Put your books underneath your desks and grab your DI folders. I will know you are ready when you have your DI sheets on your desks.”

Social Validity. After the study, participants were asked questions that were used to determine their view of the intervention. Four of the questions were multiple choice and were translated into a Likert scale from, and one question was a free response question. For example,
some of the questions asked were: A) How much did you like reading your own book independently? b) how much did you enjoy book club? c) do you like to read independently or with a partner? Additionally, the classroom teacher was asked to complete an intervention acceptability questionnaire that was similar in format (e.g., four multiple-choice questions, one free-response question). Some of the questions on the intervention acceptability questionnaire were: A) how easy was it to implement the RR intervention? b) how likely are you to implement the RR intervention? c) how likely are you to implement the SSR intervention? The free-response question prompted the teacher to provide any comments or feedback. (See appendix G-H).

RESULTS

Intervention Sessions

Figure 1 displays the percentage of intervals during which Participant 1 engaged with books during baseline and both treatment conditions. Overall, results indicated that SSR was the most effective intervention for increasing book engagement for Participant 1. During baseline, the median percentage of intervals engaged with books was 58% (range, 17-60%) for Participant 1. During SSR, the median percentage of intervals engaged with books was 77% (range, 73-93%). During RR, the median percentage of intervals engaged with books was 13% (range, 07-23%). In the final SSR condition, the median percentage of intervals engaged with books was 83% (range, 72-85%).

Figure 2 displays the percentage of intervals during which Participant 2 engaged with books during baseline and both treatment conditions. Overall, results indicated that SSR was the most effective treatment for increasing book engagement for Participant 2. During baseline, the median percentage of intervals engaged with books was 50% (range, 22-85%) for Participant 2.
During SSR, the median percentage of intervals engaged with books was 75% (range, 48-90%). During RR, the median percentage of intervals engaged with books was 23% (range, .03-57%). In the final SSR condition, the median percentage of intervals engaged with books was 63% (range, 47%-93%).

Figure 3 displays the percentage of intervals during which Participant 3 engaged with books during baseline and both treatment conditions. Overall, results showed that RR was the most effective treatment for increasing book engagement for Participant 3. During baseline, the median percentage of intervals engaged with books was 62% (range, 45-95%) for Participant 3. During SSR, the median percentage of intervals engaged with books was 73% (range, 45-95%). During RR, the median percentage of intervals engaged with books was 97% (range, 92-100%). In the final SSR condition, the median percentage of intervals engaged with books was 28% (range, 8-73%).

Figure 4 displays the percentage of intervals during which Participant 4 engaged with books during baseline and both treatment conditions. Overall, results indicated that RR was the most effective treatment for increasing book engagement for Participant 4. During baseline, the median percentage of intervals engaged with books was 63% (range, 40-65%) for Participant 4. During SSR, the median percentage of intervals engaged with books was 83% (range, 42-92%). During RR, the median percentage of intervals engaged with books was 97% (range, 85-100%). In the final SRR condition, the median percentage of intervals engaged with books was 38% (range, 17-73%).

**Test Sessions**

Figure 5 displays the percentage of intervals during which Participant 1 engaged with books during baseline and during the 5-min test session that immediately followed each
intervention session. Overall, results showed that book engagement was higher after SSR than after RR. During SSR test sessions, the median percentage of intervals engaged with books was 45% (range, 10-83%) for Participant 1. During RR test sessions, median percentage of intervals engaged with books was 25% (range, .03-58%). In the final SSR test sessions, the median percentage of intervals engaged with books was 68% (range, 43-82%).

Figure 6 displays the percentage of intervals during which Participant 2 engaged with books during baseline and during the 5-minute test session that immediately followed each intervention session. Overall, results indicated that book engagement was higher after SSR than after RR. During SRR test sessions, the median percentage of intervals engaged with books was 40% (range, 15-45%) for Participant 2. During RR test sessions, the median percentage of intervals engaged with books was 20% (range, 13-77%). In the final SSR test sessions, the median percentage of intervals engaged with books was 27% (range .05-57%).

Figure 7 displays the percentage of intervals during which Participant 3 engaged with books during baseline and during the 5-minute test session that immediately followed each intervention session. Overall, results indicated that book engagement was higher after SSR than after RR. During SSR test sessions, the mean percentage of intervals engaged with books was 88% (range, 57-100%) for Participant 3. During RR test sessions, the median percentage of intervals engaged with books was 80% (range, 42-92%). In the final SSR test sessions, the median percentage of intervals engaged with books was 70% (range, 35-88%).

Figure 8 displays the percentage of intervals during which Participant 4 engaged with books during baseline and during the 5-minute test session that immediately followed each intervention session. Overall, results showed that book engagement was higher after SRR than after RR. During the SSR test sessions, the median percentage of intervals engaged with books
was 75% (range, 18-92%) for Participant 4. During RR test sessions, the median percentage of intervals engaged with books was 72% (range, 27-93%). In the final SRR test session, the median percentage of intervals engaged with books was 85% (range, 38-88%).

**Reading Comprehension Probes**

Figure 9 displays the percentage of correct responses on comprehension probes for Participants 1, 2 and 4. Participant 3 was not included because only one comprehension probe was conducted for each condition due to her absences during the study. Overall, reading comprehension probes showed that comprehension was only higher in the RR condition for one participant. For Participant 1, comprehension was the higher in the SSR condition and there were no differences across conditions for Participant 4. Specifically, Participant 1 (Dyad 1) had an average of 58% correct responses to comprehension probes that followed the SSR treatment and an average of 28% correct responses to comprehension probes that followed the RR treatment. Participant 2 had an average of 11% correct responses to comprehension probes that followed the SSR treatment and an average of 42% correct responses to comprehension probes that followed the RR treatment. Participant 4 had an average of 83% correct responses to comprehension probes that followed the SSR treatment and an average of 83% correct responses to comprehension probes that followed the RR treatment. Total Words Written (TWW) was also measured for comprehension probes. Participant 1 had a mean of 33 TWW during SSR probes and a mean of 19 TWW during RR probes. Participant 2 had a mean of 18 TWW during SSR probes and a mean of 20 TWW during RR probes. Participant 4 had a mean of 47 TWW during SSR probes and a mean of 56 TWW during RR probes.

**Social Validity**
Participants. Overall, all participants indicated that they liked the reciprocal reading intervention. Two participants indicated that they “really liked” reading with a partner, one participant was neutral, and only one participant disliked reciprocal reading. Only one participant indicated that she liked reading independently over reciprocal reading. When asked to write the title of their favorite between the book they read independently and the book they read with a partner, three participants wrote the titles of the books they read independently, and only one participant wrote the title of one of the books she read during test observations.

Teacher. Overall, the teacher indicated that she liked both SSR and RR treatments and found the interventions “easy” to “somewhat easy” to implement, respectively. She stated that she was very likely to implement reciprocal reading for students who do not like silent reading. When prompted to provide any other comments or feedback, the teacher wrote: "Students really enjoyed book club. I noticed a lot of great friendships were created as an effect of bookclub. The kids that participated in a book club would talk in the hallway and in classes." She also stated that: "I would use this in the future for any student who disliked silent reading.” Sample data collection sheets are available in Appendices K-L.
**Book Engagement**

**Participant 1**

*Figure 1*: Percentage of time engaged with books in baseline, during SSR and RR treatment, and during SSR final treatment phase.
Figure 2: Percentage of time engaged with books in baseline, during SSR and RR treatment, and during SSR final treatment phase.
Participant 3

Figure 3: Percentage of time engaged with books in baseline, during SSR and RR treatment, and during SSR final treatment phase.
Figure 4: Percentage of time engaged with books in baseline, during SSR and RR treatments, and during SSR final treatment phase.
Figure 5: Percentage of time engaged with books in baseline, during test observations after SSR and RR treatments, and during the final phase of SSR.
Figure 6: Percentage of time engaged with books in baseline, during test observations after SSR and RR treatments, and during the final phase of SSR.
Figure 7: Percentage of time engaged with books in baseline, during test observations after SSR and RR treatments, and during the final phase of SSR.
Participant 4

Figure 8: Percentage of time engaged with books in baseline, during test observations after SSR and RR treatments, and during the final phase of SSR.
Figure 9: Percentage of correct responses on comprehension probes for Participants 1, 2, and 4.

DISCUSSION

Overview

The current experiment used an alternating treatments design to compare the effects of sustained silent reading and a modified reciprocal reading intervention called “Book Club” on the reading motivation of sixth-grade students with reading delays. Reading motivation was defined as the percentage of intervals during which students actively engaged with books. Reading comprehension probes were also conducted to assess the effects of each intervention on participants’ written retell and reflection. Results demonstrated that sustained silent reading resulted in increased reading engagement and reading comprehension when compared to the
Major Findings

SSR and RR compared to baseline. The results of this experiment suggested that the sustained silent reading (SSR) procedure was more effective in increasing book engagement than the modified reciprocal reading procedure for three of four participants. When compared to baseline, book engagement increased by an average 19-32 percentage points for Participants 1, 2, and 4. There were no differences (2 percentage point increase) for Participant 3. Similarly, during the tests that followed SSR, book engagement was higher for three of four participants (Participants 2, 3, and 4) when compared to baseline. There was no difference for Participant 1. When compared to baseline, RR treatment sessions increased book engagement by an average 28-37 percentage points when compared to baseline for Participants 3 and 4. For Participants 1 and 2, RR treatment sessions decreased book engagement by an average 38–41 percentage points. During the tests that followed RR, book engagement was an average 2-7 points higher than baseline for Participants 3 and 4 but was not higher for Participants 1 and 2.

SSR compared to RR. When compared to one another, SSR was more effective for two participants (Participants 1 and 2), and RR was more effective for two participants (Participants 3 and 4) during treatment sessions. Specifically, book engagement during SSR treatment sessions was 61-68 percentage points higher than RR treatment sessions for Dyad 1 (Participants 1 and 2). In contrast, book engagement during RR treatment sessions was 18-28 points higher than SSR for Dyad 2 (Participants 3 and 4). During test sessions, book engagement was higher during SSR than RR for all participants.
Final treatment phase. During the final SSR treatment sessions, book engagement remained high for Dyad 1 with an average of 80% book engagement and remained low for Dyad 2 with an average of 39% book engagement. During the final SSR test sessions, book engagement occurred during an average 67% of intervals for all participants.

Comprehension probes. Results of the comprehension probes varied across participants. However, in general, the probes suggest that comprehension was higher after SSR than after RR for Participants 1. Comprehension was higher after RR than after SSR for Participant 2, and there were no differences between probes for Participant 4. The comprehension probes served as a reading check to confirm that participants were reading silently or listening when following along with a peer.

Anecdotal Findings

Several anecdotal observations were made during the study. One observation was that all participants, except Participant 1, requested book club as the preferred intervention. Another observation was that peers seemed to “build friendships” as evidenced by their conversations in the hallways as well as their inquiries about their peers if they were absent, suggesting that the RR procedure may have conditioned as reinforcers the peers in the dyads. This is important since some research has suggested that building reading communities for struggling readers may be an essential part of reading instruction (Raphael & McMahan, 1994). Additionally, the teacher reported that two of the participants volunteered to read aloud during a reading lesson, which was a novel behavior for the two students. These are interesting findings because they suggest that the interventions may have had some collateral effects on students’ overall academic and social engagement.
The experimenter, teacher, and research assistant also observed the types of books that participants selected. Overall, it was reported that Dyad 1 typically selected chapter books while Dyad 2 selected picture books. A highly probable explanation for the choice in books may have been the participants’ reading levels: Dyad 1 (Participants 1 and 2) had independent reading levels that were on or just below grade level (sixth and fifth grade levels, respectively) and Dyad 2 (Participants 3 and 4) had independent reading levels that were four grades below grade level (second grade level). This anecdotal observation between the choice of text and skills level reiterates similar findings in other research which state that achievement in reading includes both “skill and will” (Bly & Greer, 2019; Gentilini & Greer, 2019; Watkins & Coffee, 2004).

There were some variations in data that are important to point out. First, for participant 1, lowest engagement of .04% occurred immediately after she returned from Out of School Suspension (OSS). For participant 2, the relatively high engagement with books that occurred during baseline may have been because the participant could access “coffee cart,” a highly preferred group activity that was part of his individualized program in the school.

**Limitations of the Current Research**

One major limitation of the current experiment was observer drift that may have occurred for the teacher when compared to the research assistant and experimenter. Since the teacher had a number of responsibilities in the classroom, ensuring that she collected data with fidelity was important for the project. To reduce the possibility of observer drift for the teacher, the experimenter conducted weekly observations and IOA to give feedback to the teacher on her treatment fidelity.

A second limitation was the possibility of observer effect on participants. The participants watched the experimenter whenever she was in the classroom, which may have led
to changes in their behavior when she was there. To decrease the effects of this limitation, the experimenter and research assistants were instructed to record data as discreetly as possible by placing computers or other work in front of their data collection materials during observations. Further, the experimenter removed herself from the classroom and collected some IOA data from the hallway while the teacher conducted the interventions.

A third limitation was the similarity between the test and intervention conditions for SSR. Specifically, SSR intervention sessions and test sessions were identical, and they were similar to the teacher’s usual silent reading procedures, which may have contributed to the students’ higher responding during SSR. The final limitation was the possibility of carryover effects between interventions. That is, alternating between treatments may have resulted in carryover across treatments.

**Application of Reading Motivation Literature to the Current Findings**

Recently, there have been several studies that have assessed the effects of various collaborative procedures on the conditioned reinforcement for book reading (Bly & Greer, 2019; Cuminskey-Moore, 2017; Gentilini & Greer, 2019, Tsai & Greer, 2006). The current study differs from these and adds to the literature in that it is the first empirical experiment that investigated and compared the effects of SSR and RR. Additionally, this study applied the procedures with participants who were secondary students with reading delays.

Research on reading motivation suggests tactics to increase reading motivation for students’ who lack motivation to read: Providing interesting books for students that are at their reading levels during free reading, collaborating during reading activities, helping students achieve reading goals, and delivering feedback on their reading performance. (Daniels, 1994, 1995; Erickson & Fornauf, 2017; Guthrie, 2013). Behavioral research suggests other tactics such
as stimulus-stimulus pairing and peer yoked contingencies (Cuminskey-Moore, 2017; Gentilini & Greer, 2109; Tsai & Greer, 2006). In the current study, both treatments included highly preferred choice of books that were closely matched to the participants’ reading levels. Additionally, during SSR, the participants were required to track the progress they were making in their book by writing down the page numbers they stopped at after each session. This added component of the intervention may have served as self-management, allowing participants to track their success progress in reading their books, possibly facilitating book engagement.

During RR treatment, stimulus-stimulus pairing procedure, a yoked contingency, and feedback following each session were implemented.

**Practical Implications and Future Research**

Future studies should consider and plan for ways to address the limitations previously discussed. For instance, researchers should plan to control for possible carryover effects by including phase changes within the design where a baseline may be added before a treatment in an AB fashion or combining the treatments at some sessions (Hayes & Blackledge, 1998). Researchers may also consider randomizing treatment sessions to control for sequential confounding. To control for observer effects and observer drift, future researchers may consider the use of cameras for individual students during treatment sessions and weekly training and feedback sessions with the implementers and the data collectors. The RR required 15-20 minutes, which left little time for other reading instructions. Future research may consider training the paraprofessional staff to implement the procedure.

In addition to these, there are other concerns that future researchers should consider. For instance, it is possible that the RR treatment and the definition of reading engagement may have underestimated the participants’ engagement with books. To decrease the possibility that
engagement is underestimated, future researchers should consider several procedural revisions such as: A) redefining book engagement such that the new operational definition for engagement includes behavior such as the listener attending to or looking at their partner reader in the Dyad and b) including a pre-training component to the current procedure in which participants are taught how to read and consume food appropriately. Additionally, researchers should consider using edibles that are easily accessible to participants during RR (e.g., chips and not popcorn). Finally, future researchers may also consider further investigations of some of the anecdotal findings including collateral effects of the interventions on other academics and the possibility of observational learning occurring between peers in the dyads and if that may function to affect engagement.

**Conclusion**

This study evaluated and compared the effectiveness of two procedures on book engagement for four secondary students with reading delays. This study extends existing research on reading motivation in behavior analysis by replicating and comparing the effects of an intervention that has been demonstrated to be effective for young children with a common school-based intervention. Results suggest that the Sustained Silent Reading procedure was most effective in increasing book engagement for advanced readers while the Reciprocal Reading treatment package was most effective for less advanced readers. These results reiterate recent research findings which demonstrate that different learners may require different types of interventions to increase reading motivation (Gentilini & Greer, 2019; Bly & Greer, 2019).

Finding effective and sustainable interventions to increase reading motivation of secondary students with reading delays is vital since these learners may need intensive interventions to catch up with their peers. Overall, the teacher suggested that procedures used in
this research were practical for her classroom setting when she indicated that both SSR and RR were interventions that she would “very likely” use with her students. Middle school teachers and other educators may consider using the SSR procedure as a practical way of increasing reading motivation for students who have on level reading repertoire and RR for less advanced students. Educators may also consider using the current procedures as supplements to ongoing reading instruction in the classroom.
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Appendix A

HSIRB Approval
Date: March 28, 2019

To: Denise Ross, Principal Investigator
    Gaige Johnson, Student Investigator for Thesis
    Student Investigators: Ariana McClellan, Brandi Fontenot, Mya Hernandez,
    Michael Jones, Katherine Mahaffy, Margaret Uwayo,
    Garrett Warrillow

From: Amy Naugle, Ph.D., Chair  

Re: IRB Project Number 15-05-04

This letter will serve as confirmation that the changes to your research project titled “Establishing the Literacy Skills of Students with Reading Delays” requested in your memo received March 25, 2019 (to add three new data collection sites [Comstock Elementary, Kalamazoo Literacy, and Portage Central Middle School]; to update recruitment, consent, and data collection materials for these sites) have been approved by the Institutional Review Board.

The conditions and the duration of this approval are specified in the Policies of Western Michigan University.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the IRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination:  

June 14, 2019
Appendix B

Procedural Checklists for Treatment Fidelity
Book Club (Reciprocal Reading)

Materials:
- 3 copies of preselected book (student selected based on MSWO)
- White board, markers, erasers to track teacher vs. student team points
- Bin with 2 red cards for each participant for when they “pass”, data sheets, pen/pencils
- Audio recorder (voice memos) for reading sessions

Setting: Mrs. Hug’s classroom (2nd & 7th hrs) (“Margo’s corner” at the back of the room)

Pre-training: Behavioral Skills Training (BST) Engaged Reading (SESSION 1 ONLY)
- Show students various snacks (chips, drinks, cookies etc.) and prizes
- Tell students: “We are going to do a book club together. Today, we will practice how to do that. From now on when I tell you it’s time for book club, you will walk over to this desk and choose a snack which you can eat and drink while we read. You may also choose a prize from my prize bag. After choosing your snacks you will walk over to the bean bag area, grab a copy of your books and get ready to read with me.”
- Teacher shows students where all prize/snack bins are located
- Follow students to “Margo’s Corner” & sit w/students
- Tell students: “we are going to read together as a group. Each of us will take a turn to read, I will randomly call your name when it's your turn to read. To be an engaged reader, you need to follow along when others are reading. It’s important for you to follow along so that you can pick up right where your peer stopped. Each of us will have 1 min to read when it’s our turn. Take your time when reading and do a good job. If my 1min timer rings and you’re in the middle of a sentence, finish the sentence and then stop reading so I can call on the next person. If you read a word incorrectly, I will tell it to you. We will also play a game during book club, teacher vs. you guys as a team. Each time one of you reads when I call on you, you will earn a point for everyone. Each of you has a red card. You can use the card to “pass” ONCE during each reading session. If you choose to “pass” when I call on you, I will get a point. At the end, the team that has the most points wins and get can a reward. You can also eat and drink while we're reading together.
- Again, here are the rules:
We will take turns reading for 1mn each
I will randomly call on you to read when it’s your turn
You will earn a point for your team when you read
If you read a word wrong, I will tell it to you
Follow along when others are reading
You can use your “pass” card once each session
I will get a point if you choose to “pass”, I will also get the point if you don’t know where to start when it’s your turn to read
The team with the most points wins at the end and gets a reward
You can eat and drink while we’re reading
Do you have any questions?” Let’s practice
Researcher gives students copies of the same article
Students and researcher practice described procedures
Turn taking, following along when others are reading using pass card, points,
Researcher delivers feedback appropriately
Following practice, have students choose a book for book club by following these steps:
Teacher instructs students to choose 1 highly preferred book from own bin
Teacher writes titles of selected (3) book on pieces of paper, folds them, & puts in a bin
Teacher selects 1 piece of paper from the bin and the title selected is the book the dyad will read

Daily Book Club Steps

Instruct students to select their prizes for today’s session (see large sack w/reinforcers)
Students can take their prizes w/them to the reading area and collect them at the end of class period
Write “Teacher. Vs. Team” on whiteboard for points
Put board in front of bean bag where students can see it
Start voice memos recorder
Say: “Let’s start our book club. When the timer rings, I will call on someone to read. Remember all the rules.”
Read rules:
We will take turns reading for 1mn each
I will call on you to read when it’s your turn
You will earn a point for your team when you read
If you read a word wrong, I will tell it to you
Follow along when others are reading
You can use your “pass” card once each session
I will get a point if you choose to “pass”, I will also get the point if you don’t know where to start when it’s your turn to read
The team with the most points wins at the end and gets a reward
You can eat and drink while we’re reading

Set timers: (One 10 min timer for session and another timer for 1mn - this will be used to indicate when the next interval)
Call on each student to turn by turn every 1mn
If student chooses to “pass”, teacher reads for 1 min and then call on the next student
Deliver points to team appropriately as students read
If student struggles w/a word for more than 5s tell it to them
As each student reads, write their initials next to the paragraph they read
To track errors, mark a slash (/) through each word they read incorrectly & write the word they said above it (e.g. if they read sly instead shy, put a slash through shy and write sly above it)

Data collection:
Record data on occurrence per trial (did participant read Y/N/P AND did student pick where peer stopped independently Y/N
Write student errors in each interval in appropriate column
RA: Take 10s time sample data, IOA, or Fidelity (optional)
After each student has read 5x or 10mn have passed
Deliver overall feedback 1 statement of praise (e.g. great job following along, reading each time I called on you) & error correction (this word is X)
Students repeat the word after correction
Teacher tells students to put their snacks/other materials away
Teacher implements silent reading test by stating: “grab a chapter book and silent read at your desks”
Allow 5-s latency and teacher/researcher records whole interval data during 5mn test

SCORE: ________/34
Teacher initials: ___________ Date: _______ Fidelity Checker initials: _______

Session#: ___

Sustained Silent Reading

Materials:
- Preselected book (student selected based on MSWO)
- Classroom library books (available all the time)
- Data sheets for whole interval recording, pens/pencils

Setting: Mrs. Hug’s classroom
- Students read at their desks

Choosing a Book for Independent Reading (SESSION 1 ONLY)
- Tell students to choose 1 highly preferred book from own bin
- Tell students to write the title of the book on “independent book datasheet”
- Tell students that “You’re going to read this same book for all the independent book reading sessions. After each reading period, you will write down the page numbers that you read. Let me give you an example”
- Researcher demonstrates
- Ask students to practice using datasheet
- Deliver feedback

Independent Reading Steps
- Instruct students to write today’s date on independent book datasheet which is in their student book bin and
- Allow them to take book they’ve been reading
- Tell class: “Grab a chapter book and silent read in your seats”
- Set timer for 10- min session
- Allow 5s latency
- Record 10-s whole interval data on each participating student
  (+) = book reading behaviors (head movement/ scanning movement across pages left to right, top to bottom, turning pages, mouth movement along w/eye movement), talking about the book
  (-) = looking away from book for more than, touching the book but not engaging with it, talking with peers non reading behaviors, look at other stimuli in the classroom
- After 10mn, instruct students to record page numbers on independent book datasheet
- Conduct book engagement test by telling students: “Grab a different chapter book and silent read in your seats”
- Allow 5-s latency and record whole interval data for 5mn reading test
- Terminate session by telling students to go back into DI groups

SCORE:__________/18
Appendix C

Book Engagement: 5-min Test
- 5s whole interval recording. **12 INTERVALS = 1MN. MC = 48/60 (80%).**
- (+) = book reading behaviors (head movement/scanning movement across pages left to right, top to bottom, turning pages, mouth movement along with eye movement), talking about the book
- (-) = looking away from book, hands on the book but looking away/not engaging with it, talking with peers non-reading behaviors, look at other stimuli in the classroom
- **SD:** “Grab a CHAPTER BOOK and silent read in your seats”. Allow 5s latency & **start recording.**

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**TOTAL**

**Did student select chapter book:** Yes / No

**NOTES:**
Appendix D

Book Engagement: Sustained Silent Reading Datasheet
- Session: 10 min. Use 10s whole interval recording. **6 10s INTERVALS = 1mn, MC = 48/60 trials or 8mn.**
- (+) = book reading behaviors (head movement/ scanning movement across pages left to right, top to bottom, turning pages, mouth movement along w/eye movement), talking about the book
- (-) = looking away from book, hands on the book but looking away/not engaging with it, talking with peers non-reading behaviors, look at other stimuli in the classroom
- SD: "**Grab a chapter book and silent read in your seats**" After students were seated, allow 5s latency & start recording.

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**TOTAL**

*Did student select chapter book: Yes / No*

**NOTES:**
Appendix E

Sustained Silent Reading Book Progress Tracker
Name: ________________________________ Start Date: __________

Book Title: __________________________________________________________________________

1. Today________(date), I read from page _________ to page ________________

2. Today________(date), I read from page _________ to page ________________

3. Today________(date), I read from page _________ to page ________________

4. Today________(date), I read from page _________ to page ________________

5. Today________(date), I read from page _________ to page ________________

6. Today________(date), I read from page _________ to page ________________

7. Today________(date), I read from page _________ to page ________________

8. Today________(date), I read from page _________ to page ________________

9. Today________(date), I read from page _________ to page ________________
Appendix F

Reciprocal Reading Treatment Datasheet
**Protocol:** 1) Call on student to read (quasi randomly) 2) Set 1-MIN timer when student begins to read 3) Record participation data:
   - (+) = student chose to read
   - (-) = student did not read/used “PASS” card.

**Book Title:**

**Dyad Names:**

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- Today, we stopped on pg. _______________ paragraph ___________
Appendix G

Book Engagement and Food Consumption During Book Club Datasheet
- Session: 10 min. Use 10s whole interval recording. 6 10s INTERVALS = 1mn, MC = 48/60 trials or 8mn.
- Record book engagement of LISTENER: (+) = following along with reader (head movement/scanning across the page, turning pages, tracking with finger or pencil), (-) = looking away from book for more than 4s consecutively, failing to pick up where peer stopped. Record Eating & Drinking: (+) = student eats/drinks any time during 10s interval (-) = student did not eat during interval

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**Total**

**NOTES:**

Did student select chapter book: Yes / No

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86
Appendix H

Reading Check Rubric
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Appendix I

Reading Check Writing Sample
1. Write about what you read in your book today. Write everything you remember about this story. Use complete sentences. You can fill up this whole space and the back. You have 3 minutes.

“So there are five character right know and they all have magical creature as there pets and one of the character pet is not behaving so the character tries to calm down his pet but it is not calming down it is like we need to leave we need to go or else she will take us away and we will have to be locked up and never let out and we will not able to see see are owners.”

1. What do you like about the story so far?

“I like that it is about how they interdesuse the magical creature.”

1. What do you NOT like about the story?

“I don’t like that it is very girly and kind of boring.”

1. What do you think will happen next?

“They will have a free life.”
Appendix J

Participant Social Validity
Name:______________________________ Date:__________________

1. How much did you like about reading books project?

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2. How much did you like taking turns reading with a partner?

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<tr>
<th>Did not like it</th>
<th>It was okay</th>
<th>Really liked it</th>
</tr>
</thead>
</table>

3. How much did you like reading your own book independently?

<table>
<thead>
<tr>
<th>Did not like it</th>
<th>It was okay</th>
<th>Really liked it</th>
</tr>
</thead>
</table>

4. How much did you enjoy book club (reading and eating snacks)?

<table>
<thead>
<tr>
<th>Did not like it</th>
<th>It was okay</th>
<th>Really liked it</th>
</tr>
</thead>
</table>

5. Would you like to participate in book club in the future?

<table>
<thead>
<tr>
<th>I would rather not</th>
<th>I don’t care</th>
<th>I would really like to</th>
</tr>
</thead>
</table>

6. Do you like to read independently or with a partner?

<table>
<thead>
<tr>
<th>Read with a partner</th>
<th>Read independently</th>
<th>I don’t care</th>
</tr>
</thead>
</table>
7. What was your favorite book that you read? Write its title:

8. What would you like to see happen in future book clubs?

9. Any other comments for Ms. Margo?
Appendix K

Teacher Intervention Acceptability
Name: __________________________       Date: ____________________

1. How well did you understand the book club procedure?

<table>
<thead>
<tr>
<th>Very poor</th>
<th>Moderately poor</th>
<th>Moderately well</th>
<th>Very well</th>
</tr>
</thead>
</table>

2. How effective were the trainings and feedback for this intervention?

<table>
<thead>
<tr>
<th>Very ineffective</th>
<th>Moderately effective</th>
<th>Moderately effective</th>
<th>Very effective</th>
</tr>
</thead>
</table>

3. How much do you like the book club intervention (10 minutes pairing and 5-minute test) for your students?

<table>
<thead>
<tr>
<th>Did not like it at all</th>
<th>Somewhat liked it</th>
<th>Liked it</th>
<th>Loved it</th>
</tr>
</thead>
</table>

4. How easy was it to implement the book club intervention?

<table>
<thead>
<tr>
<th>Very difficult</th>
<th>Somewhat difficult</th>
<th>Somewhat easy</th>
<th>Very easy</th>
</tr>
</thead>
</table>

5. How likely would you be to use the intervention for your students?

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Somewhat unlikely</th>
<th>Somewhat likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

6. Would it be acceptable to use this intervention for older students who do not like reading?

<table>
<thead>
<tr>
<th>Very poor</th>
<th>Somewhat poor</th>
<th>Somewhat well</th>
<th>Very well</th>
</tr>
</thead>
</table>

7. How much do you like the independent book club intervention (10 independent reading and 5-minute test)?

<table>
<thead>
<tr>
<th>Did not like it at all</th>
<th>Somewhat liked it</th>
<th>Liked it</th>
<th>Loved it</th>
</tr>
</thead>
</table>

8. How likely would you be to use the intervention for your students?
<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Somewhat unlikely</th>
<th>Somewhat likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

9. Any other comments or feedback? (e.g. future consideration etc.)
Appendix L

Table 1: Participant Characteristics
<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Participant</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Free/Reduced Lunch Status</th>
<th>SDQA Independent Level</th>
<th>NWEA Lexile Reading Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyad 1</td>
<td>Participant 1</td>
<td>12</td>
<td>F</td>
<td>Specific Learning Disability (SLO)-math</td>
<td>Yes</td>
<td>5\text{th} grade</td>
<td>400-500 2nd grade</td>
</tr>
<tr>
<td></td>
<td>Participant 2</td>
<td>12</td>
<td>M</td>
<td>Cognitive Impairment (CI)-mild</td>
<td>Yes</td>
<td>4\text{th} grade</td>
<td>90-140 Pre/Primer</td>
</tr>
<tr>
<td>Dyad 2</td>
<td>Participant 3</td>
<td>12</td>
<td>F</td>
<td>Other Health Impairment (OHI)</td>
<td>No</td>
<td>2\text{nd} grade</td>
<td>300-535 2nd grade</td>
</tr>
<tr>
<td></td>
<td>Participant 4</td>
<td>12</td>
<td>M</td>
<td>Specific Learning Disability (SLO)-reading</td>
<td>No</td>
<td>2\text{nd} grade</td>
<td>500-600 3rd Grade</td>
</tr>
</tbody>
</table>
Appendix M

Table 2: Mean Percentage of Time Engaged with Books During Treatment
### Table 2. Mean Percentage of Time Engaged with Books During Treatment

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline (%)</th>
<th>SSR (%)</th>
<th>RR (%)</th>
<th>SSR Final Phase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>50%</td>
<td>80%</td>
<td>12%</td>
<td>80%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>52%</td>
<td>84%</td>
<td>23%</td>
<td>66%</td>
</tr>
<tr>
<td>Participant 3</td>
<td>66%</td>
<td>68%</td>
<td>96%</td>
<td>34%</td>
</tr>
<tr>
<td>Participant 4</td>
<td>58%</td>
<td>77%</td>
<td>95%</td>
<td>43%</td>
</tr>
</tbody>
</table>
Appendix N

Table 3: Mean Percentage of Time Engaged with Books During Test Observations
Table 3. Mean Percentage of Time Engaged with Books During Test Observations

<table>
<thead>
<tr>
<th>Participant</th>
<th>Baseline (%)</th>
<th>SSR (%)</th>
<th>RR (%)</th>
<th>SSR Final Phase (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>50%</td>
<td>50%</td>
<td>25%</td>
<td>64%</td>
</tr>
<tr>
<td>Participant 2</td>
<td>52%</td>
<td>38%</td>
<td>33%</td>
<td>28%</td>
</tr>
<tr>
<td>Participant 3</td>
<td>66%</td>
<td>84%</td>
<td>73%</td>
<td>66%</td>
</tr>
<tr>
<td>Participant 4</td>
<td>58%</td>
<td>67%</td>
<td>60%</td>
<td>70%</td>
</tr>
</tbody>
</table>