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The Impact of Video Self-Modeling on Oral Reading Fluency and Reader Self-Perception

Catherine Anderson
California State University, Monterey Bay

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By: Catherine Anderson

APPROVED BY THE GRADUATE ADVISORY COMMITTEE

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Jaye Luke, Ph.D., Advisor, Master of Arts in Education

_____
Kerrie Chitwood, Ph.D., Advisor and Coordinator, Master of Arts in Education

Digitally signed by Kris Roney, Ph.D.

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Kris Roney, Ph.D., Associate Vice President
Academic Programs and Dean of Undergraduate & Graduate Studies

Abstract

Oral reading fluency is the ability to effortlessly decode text while deriving full meaning from what has been read. This is a skill struggling readers lack and is particularly critical for high school students asked to comprehend ever higher levels of reading materials. Using a multiple baseline-across-participants design, this study measured the impact of video self-modeling (VSM) on oral reading fluency and reader self-perception. The three participants, two boys and one girl, ages 15 to 18, attended a combination 9th-12th grade special day class for students with moderate to severe disabilities. Curriculum-based measurement probes established word correct per minute (WCPM) scores of oral reading fluency across all phases. During intervention, participants watched individualized VSM videos depicting them reading without error at goal-level. All participants increased oral reading fluency rates and improved reader self-perception scores in pre- and post-responses on a modified Reader Self Perception Scale (RSPS) survey. Social validity was assessed and overall positive results were reported by participants and the classroom teacher.

Key Words: Video Self-Modeling, VSM, Learning Disabilities, Oral Reading Fluency, Reading

Acknowledgments

Thank you to all who helped me along this challenging and rewarding journey.

"It does not matter how slowly you go, as long as you do not stop."
-Confucius

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The Impact of Video Self-Modeling on Oral Reading Fluency and Reader Self-Perception Literature Review

The ability to read fluently is a critical skill necessary for academic achievement and is strongly linked with overall success in school (Henk & Melnick, 1995). To assist students to attain reading fluency, teachers must provide systematic, explicit, guided, and intensive reading instruction (National Reading Panel (NRP), 2000). To teach reading competency, the NRP (2000) recommends mastery of the following literacy components: phonemic awareness, phonics and sound blending, guided oral reading, as well as vocabulary and comprehension. All five components are necessary for development of proficient literacy skills and vital for becoming a successful reader, however, reading fluency is the necessary link between word recognition and comprehension (NRP, 2000).

Reading fluently is defined as the ability to read text aloud with speed, accuracy, and prosody (NRP, 2000). There are multiple ways to intervene to improve reading fluency, including guided oral reading, which promotes reading aloud and receiving guidance and feedback from a skilled reader. Guided oral reading improves fluency skills such as acquisition of new words, reading accuracy, and comprehension of what has been read (National Institute for Literacy, 1997). Fuchs and Fuchs (1992) demonstrated that increased reading fluency leads to improvement in reading comprehension, while the NRP (2000) itself stressed that students who do not develop oral reading fluency skills are likely to remain poor readers.

Students with reading difficulties are well aware they read below peer-level, a fact that often causes deep frustration and shameful feelings that are difficult to overcome (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Struggling readers are also learners with a track record of receiving negative responses from classmates, teachers, and family, and consequently have become exceedingly reluctant to read aloud or practice oral reading skills. This is

counterproductive, because what is needed most for fluent reading mastery is to experience successful practice and receive encouraging feedback (Chapman, Tunmer, & Prochnow, 2000; Dowrick, Kim-Rupnow, & Power, 2006).

Without exposure to new and positive reading experiences to replace prior negative associations, students that grapple with reading can come to believe they are incapable of improving as readers (Linnenbrink & Pintrich, 2003). Additionally, students saddled with negative self-beliefs frequently become apathetic learners, and lack of motivation to learn can trigger persistent unwelcome behaviors and unproductively in the classroom (Henk, Marinak, & Melnick, 2013; McKenna, Kear, & Ellsworth, 1995). Consequently, poor readers may become deficient in the development of critical social skills, due to disinterest in participation or inability to attend to what is being taught at school (Mechling & Hunnicutt, 2011).

Reading proficiency is vital for social development and is clearly related to feelings of self-worth, impacting student interactions inside and outside of the classroom (Henk et al., 2013; Singer-Califano, 2008). Positive reader self-perception is key for reading success and maintaining the student motivation needed to learn and develop. Recurring adverse learning experiences that offer little opportunity for mastery of skills can cause students to adopt low expectations and conclude they have little effect over their ability to be educated (Davis Lazarus & Callahan, 2000; Gilmore & Cuskelly, 2009).

Unengaged learners continuing to experience critical feedback from teachers and peers, may increase disruptive behaviors that further interfere with learning. This trend may evolve into disadvantageous cycles limiting opportunities to strengthen useful coping skills and problem-solving strategies necessary to function well in today's world (Sutherland & Singh, 2004). As such students age, they gain fewer of the essential life skills needed to promote their

own greatest independence and self-sufficiency (Linnenbrink & Pintrich, 2003). Ultimately, the inability to read fluently may negatively impact their capability to find living wage employment in a desirable field and most likely will lessen the likelihood of higher educational opportunities (Burgstahler, 2003; Elder-Hinshaw, Manset-Williamson, Nelson, & Dunn, 2006).

With such high-stake consequences, it is essential to identify effective interventions for learners that struggle with reading mastery and oral reading fluency, and especially for those with learning disabilities receiving special education services (Hall, Leat, Wall, Higgins, & Edwards, 2006; Chapman et al., 2000). It is vital that teachers find and provide access to alternative reading strategies in addition to regular classroom reading curriculum to provide the reading experiences necessary for success (Lightfoot, 2005; Martin, 2006).

Learning to read with confidence enhances the lives of struggling readers, because inability to read affects self-esteem and self-efficacy (Klassen, 2002; Sutherland & Singh, 2004). Self-esteem is defined as the regard we have for ourselves, while self-efficacy reflects the confidence we have in our ability to exercise control over our own motivations, behaviors, and living environments (Bandura, 1977, 1982). Having high self-efficacy while performing an academic task such as reading is indispensable, because it inspires the individual to independently engage in practicing the necessary skills for improvement (Brophy,1999; Dowrick, 1999).

Furthermore, learners with high levels of self-efficacy persist in mastery of difficult tasks and achievement of goals, even if present abilities are not yet evident. Conversely, students with low self-efficacy do not persist, because of a perceived notion that they cannot perform the task or meet the goal that is being asked of them (Dowrick, 1999; Schunk, 1984). This is important

because low self-efficacy and negative attitudes about reading play a huge role in overcoming reading difficulties and can determine whether or not skills will develop and progress.

Two specific studies on self-efficacy and reading attitudes, McKenna et al. (1995) and Chapman et al. (2000), determined that outlook when students were young and learning to read began positively but steadily declined with age, ending in reading apathy. Reading achievement determines attitude and is lowest for learners who perform poorly on reading assignments and labor to read aloud. This supports the theory that reading attitudes are strongly influenced by collective factors that, bit by bit, and over long periods of time, mold and shape reader self-perception.

Thus, deterioration of reading self-efficacy most likely begins during the primary school years, when students learn-to-read and their perception that success or failure, and lack of personal control over ability, is well-established (Hampton & Mason, 2003; Sutherland & Singh, 2004). Furthermore, the high school years offer additional complexity not found at lower grade levels. Since more information is presented as students read-to-learn, those already overwhelmed with reading difficulties must cope with increasingly challenging work assignments and reading materials (Hampton & Mason, 2003; Lamb & Johnson, 2012).

Therefore, secondary education must provide opportunities to teach these young adults the reading skills needed for transition into fullest self-sufficiency, so that they may meet the future with the ability to function as equal members of society (Bandura, 1997; Mechling & Ortega-Hurndon, 2007). This is especially crucial for high school students receiving special education services in the moderate to severe setting, because although many will continue to receive educational support until age 22, after that time public school programs end (Burgstahler,

2003; Elder-Hinshaw et al., 2006); Mull & Sitlington, 2003). Students that are already in high school and that lack reading skills have little time left to make significant progress.

In general, moderate to severe classroom curriculum centers on continual mastery of essential life skills, including communication and functional academics. Here, the goal of nearly all learners will be to expand present interactions within the community and world around them (Skouge, Kelly, Roberts, Leake, & Stodden, 2007). In some cases, less emphasis may be placed on increasing reading skills; this may occur for a variety of reasons, including priorities set by the educational team, student ability, and lack of teacher resources to continue to wholeheartedly try different approaches to reading instruction.

However, if there is any possibility of attaining desirable literacy skills, student objectives will include them. Still, many students with learning disabilities, and especially in moderate to severe classrooms, continue to experience frustration as they grapple to master needed competencies, such as reading aloud with fluency (Chapman & Tunmer, 1995). Consequently, they remain uncomfortable and hesitant readers, possibly because instruction relies solely on traditional teaching strategies that do not always succeed with this population - even if lessons have been carefully individualized and utilize sound research-based practices (Lamb & Johnson, 2012; Schrand, 2008).

Legislation such as the Individuals with Disabilities Education Act (IDEA, 1997, 2004) and No Child Left Behind (2001), as well as increased focus on technology, application of best practices, and need for more evidence-based methodologies, have all improved special education programs and services. Along with these changes, teacher accountability and the need to use these approaches in the classroom have also increased, as well as the requirement to make

modifications and accommodations for students that struggle to learn (Martin, 2006; Ryan, Hughes, Katsiyannis, McDaniel & Sprinkle, 2011; Yell & Shriner, 1997).

Furthermore, there has been a long-established history of literacy invisibility, as parts of society continue to deny the ability of those with perceived learning disabilities to be literate people or belong as equal members in literate communities (Kliewer, Biklen, & Kasa-Hendrickson, 2006). Fortunately, more recent socio-cultural shifts demand that we provide students in the special education setting differentiated instruction, and treat them as one of a kind learners, drawing on unique blends of preferred aptitudes by which they demonstrate skills and abilities (Bellini & McConnel1, 2010; Ofiesh, 2004).

Instructional content delivered by visual, auditory, and tactile modes is an effective means by which students with a variety of learning styles, and with difficulty attending or maintaining focus, can learn (Brooks, Nolan, & Gallagher, 2001; Lambert & Cuper, 2008). With access to interactive multimedia and eye-catching images, graphics, and interesting hyperlinks, many students are able to adopt new learning patterns, such as actively taking part in lessons and maintaining attentiveness without continual prompting (Brunvand & Abadeh, 2010; Hasselbring & Williams Glaser, 2000; Schuck, 2005).

When allowed access to computer-based instruction or other technology-based learning tools, self-direction and full involvement can become a reality for many previously indifferent students (Mayer, 2003; Mechling & Ortega-Hurndon, 2007; Seok, DaCosta, Kinsell, Poggio, & Meyen, 2010). This may be because more lasting engagement occurs when new information is addressed in ways that better incorporate individual modes of learning - where it can be processed, and the desired skills acquired - through some combination of visual, auditory, and kinesthetic means (Barbe & Milone, 1981).

Students with learning challenges often benefit from non-traditional instruction, specifically, technology-based, multimedia learning tools and strategies with a mix of visual, verbal, aural, kinesthetic, logical, social, and solitarily modes used to develop and convey facts, details, and knowledge (Gardner, 1999; Stanford, 2003; Sternberg, 1977). This may be why traditional lessons concentrating on memory skills and pattern practice, with information delivered via lecture, textbooks, overhead projectors, and paper organizers, do not meet the needs of those with many learning disabilities (Kennedy & Deshler, 2010; Mayer, 2005, 2009).

Additionally, teachers may not always provide adequate solutions to resolve these difficulties and many learners develop reliance on others (teachers, paraprofessionals, parents, and peers) to generate and carry out essential goals and achievements for them. As a result, such students can come to view education with diminished personal responsibility (Bruvant & Byrd, 2011; Valas, 2001). However, media-rich learning environments and instruction presented through multisensory resources are often capable of creating innovative and useful learning experiences that better meet the needs of students that struggle in traditional learning environments (Klassen, 2002; Neo & Neo, 2004; Rosen, 2009).

Technology can provide the multimedia delivery system (through audio, video, and text with symbol support pictures) that can peak student curiosity, increase desire to learn and engage, and promote productive behaviors like following directions, and minimizing unnecessary class interruptions (Mechling, 2005). This may happen because user control over much of the learning process is now in the hands of the learners themselves (Jackson, Gaudet, McDaniel, & Brammer, 2009; Williams, Wright, Callaghan, & Coughlan, 2002). Giving students in special education some control over their learning environment is recommended, and adding technology into the mix may present a unique approach to reading mastery that may

prove of great benefit. By receiving reading instruction in a non-conventional manner that supplies a wider-range of learning modalities, participants may receive the key to unlocking understanding that they have previously been missing (Mazzotti, Wood, Test, & Fowler, 2012).

Such rewarding learning experiences increase self-esteem, and they can and do change how students feel about their own academic abilities; they not only provide new building blocks for acquiring knowledge but can promote learner interests and improve attitudes as well (Linnenbrink & Pintrich, 2003; Singer-Califano, 2008). Many struggling readers have come to correlate traditional reading instruction with *failure*, due to continual difficult and negative experiences they have encountered while trying to learn to read. Fortunately, these students already associate instruction via technology with *success*, due to overwhelmingly positive encounters they have experienced using multimedia in their everyday lives (Jackson et al., 2009; Ofiesh, 2004; Rosen, 2009).

Traditional reading interventions such as repeated reading, paired oral reading, echo and cloze reading have been used in the classroom for over forty years, yet are often not effective strategies when used alone for students with learning disabilities (Moore & Calvert, 2000). However, when used in conjunction with multisensory, technology-based instruction, student self-confidence, behavior, and academic skills may all improve, and incorrect thinking about what can be learned challenged (Kleemans, Segers, Droop, & Wentink, 2011; Seok et al., 2010; Skouge et al., 2007).

Specifically, video self-modeling (VSM) may present a broader-range of preferred learning modalities and intelligences by which to be taught, thus increasing the likelihood that learning will take place (Cihak & Schrader, 2008; Evmenova, Behrmann, Mastropieri, Baker, & Graff, 2011; Prater, Carter, Hitchcock, & Dowrick, 2012). VSM uses video technology as a

vehicle for individuals to model desired outcomes or skills that may help them improve performance. This is significant because self-modeling or imitation is used to acquire self-efficacy, and to acquire self-efficacy, participants must observe their own success (Bandura, 1982, 1986). Bandura (1986) proposed individuals learn by observing and imitating the actions of others as well as of themselves; in other words, they observe what a model does as well as the consequences of the model's actions, even if *they* are their own model.

VSM intervention is an evidence-based practice used to improve student behaviors and educational skills, with a history of more than forty years of use (Bellini & Akullian, 2007; Buggey & Ogle, 2012; Hitchcock, Dowrick, & Prater, 2003). VSM has been shown to provide an effective stratagem for many participants of all ages, across many settings, often directed toward people with disabilities and challenges to overcome. Much research indicates VSM improves conduct, functional life skills, communication abilities, as well as reading acquisition and writing (Hitchcock, et al., 2003; Mechling & Hunnicutt, 2011).

VSM creation techniques use carefully edited videos to deliver a final product, wherein learners watch themselves modeling their own successful, error-free performance of some desired action or skill - proficiencies beyond present levels of ability, but at only slightly higher levels, because learners must have the inherent ability to achieve the desired modeled outcome (Buggey, 2007; Dowrick, 2012). Buggey (2005, 2007) also noted that self-recognition of the participant on a computer screen and the ability to maintain attention on a short video is essential for success with VSM. How-to-instructions to create videos for VSM intervention have been documented in published articles and are also readily accessible on the internet (Buggey, 2005; Collier-Meek, Fallon, Johnson, Sanetti, & Delcampo, 2012).

VSM may provide an information scaffold with plentiful opportunities for interactivity controlled by the learner, as videos can be watched as often as deemed necessary. Participants repeatedly viewing VSM videos that show them reading well and confidently are likely to increase personal satisfaction in reading and may come to believe they have the capacity to function at such a level. Students may also increase self-efficacy by watching the direct evidence that they can be successful readers (Buggey, 2005). These positive VSM experiences may supply instruction in a non-traditional setting offering learning experiences that change reader self-perceptions and improve reading skill levels (Buggey, 2007; Dowrick, 2012; Prater et al., 2012).

Literature review articles by Hitchcock et al. (2003), Buggey and Ogle (2012), and Prater et al. (2012), provided in-depth examination of all published studies on VSM. Each of these reviews reported VSM literature covering many years, beginning in the 1970's and ending with the publication date of the authors' own papers. Each reported that most VSM interventions used single-case research designs with relatively small numbers of participants; however, due to the nature of the custom-created videos, large-scale studies were not likely to be undertaken. They also reported that the vast majority of VSM literature provided positive outcomes relative to the interventions as applied in both clinical and school settings, most often targeting social skills, but also used to improve task completion, as well as academic performance, such as math, science, and reading skills.

Conversely, only a handful of studies have been undertaken using VSM as an intervention to specifically improve oral reading fluency. They include Greenberg et al. (2002), Hitchcock, Prater, and Dowrick (2004), Dowrick et al. (2006), Decker and Buggey (2014), Montgomerie, Little, and Akin-Little (2014), and Robson, Blampied, and Walker (2015).

Nevertheless, the majority of these studies also reported participant success with VSM intervention and positive gains in reading fluency. Greenberg et al. (2002), in a non-peer reviewed journal article, conducted research with three, 3rd-grade students below grade-level in oral reading fluency and also examined reader self-perception. They reported VSM technology improved oral reading fluency in all of the students as well as their reader self-perception.

Hitchcock et al. (2004), stated four 1st-grade students with mild to moderate disabilities made significant reading progress through use of VSM. In their study, three participants doubled their reading fluency, and one participant increased reading fluency by four times the original rate. Dowrick et al. (2006) compared effects of VSM plus tutoring and tutoring alone on reading fluency of ten 1st-grade students at risk of academic failure. Results indicated nine out of ten participants showed improvement during intervention.

Decker and Buggey (2014), addressed the oral reading fluency of elementary students with learning disabilities, and compared effects of VSM and video peer-modeling to a control group. Results showed participants in both the VSM group and video peer-modeling group made improvements in word correct per minute (WCPM) rates, with no significant changes observed in the control group. Montgomerie et al. (2014), added to the literature by utilizing VSM for four, 3rd-grade, general education students lacking adequate improvements in reading. Data demonstrated VSM increased oral reading fluency in all four participants. And finally, Robson et al. (2015) in a non-peer reviewed journal article, used VSM to improve reading fluency in 11 primary school children. Reading performance (accuracy, comprehension and rate) was measured as dependent variables and results showed the majority of the participants improved reading fluency, comprehension, and accuracy as well as reader self-perception.

Even fewer studies have specifically used VSM to change reading attitudes among learners with identified reading disabilities, therefore, more quantitative research is needed to determine if VSM can be used to help struggling readers to improve reader self-perception (Montgomerie et al., 2014). However, Decker and Buggey (2014), observed both teacher and parents found VSM intervention had a positive effect on student outlook; reading attitudes were inferred because students were reported to be more engaged in reading and more interested in getting started reading. Greenberg et al. (2002) and Dowrick et al. (2006) also reported student satisfaction in watching their videos and provided teacher comments regarding improved student engagement and participation.

Research Question

What is the impact of implementing VSM intervention on the oral reading fluency and reader self-perception of high school students with moderate to severe disabilities?

Methods

Setting

This study occurred along the central coast of California, in a town with less than 10,000 people, in a secondary school located in an unincorporated area of the county. The school served approximately 1,400 students enrolled in 9th-12th grade that were predominately White (58%) and Hispanic/Latino (36%). Approximately 12% of the students were receiving special education services. The participants in this study attended a self-contained, combination 9th-12th grade classroom for moderate to severe disabilities. The class included one teacher, six aides, and one behavior technician.

Participants

The three participants were selected by the classroom teacher and chosen based on need to improve oral reading fluency and/or reader self-perception. Each participant was capable of attending to tasks up to 15 minutes in length without need for breaks. All participants had experience working in one-on-one instructional settings, and were able to utilize the classroom desktop computers. Students were not included if they did not have a need to improve oral reading fluency and/or reader self-perception. Participants were given a pseudonym to guarantee confidentiality and anonymity.

Student 1. Joe was an 18-year-old Hispanic/Latino male attending his senior year. Joe read at a 2nd grade reading level and had intellectual disability.

Student 2. Max was a 16-year-old Hispanic/Latino male attending his junior year. Max read at a 2nd grade reading level and had autism.

Student 3. Rosie was a 15-year-old White female attending her sophomore year. Rosie read at a 2nd grade reading level and had autism.

Materials

Classroom reading curriculum. The classroom reading curriculum, Unique Learning System (n2y, 2016), cloud- and standards-based, and aligned to Common Core, was designed for students with special needs. The curriculum provided access to four differentiated levels of text: Simple, Regular, Higher, and Advanced (see Appendix A). Reading passages were generated with text alone or in combination of words and symbol support pictures, depending on teacher assessment of student need and level of performance. Reading passages generated from this curriculum were used in this study to assess oral reading fluency rates as curriculum-based measurement (CBM) probes.

Modified Reader Self-Perception Scale (RSPS). Due to participant skill levels, a modified version of the Reader Self-Perception Scale (Henk & Melnick, 1995) survey was used to gauge awareness, confidence, and self-efficacy in the ability to read (see Appendix B). The RSPS scales were based upon the basic self-efficacy model described by Bandura (1977, 1982) and Schunk (1984). Participants in this study were provided 19 statements about reading from the 33 statements in the original RSPS, with results reported as comparison of percentage of increase or decrease in pre- and post-survey scores.

Henk & Melnick (1995) arranged the statements into five subscales: General Perception (GP), Progress (P), Observational Comparison (OC), Social Feedback (SF), and Physiological States (PS). In this study, the participants received one GP, four P, four OC, five SF, and five PS statements to respond to. The RSPS was orally administered by the researcher to the participants before and after intervention and the survey process thoroughly explained. Emoticons were used to represent "strongly agree", "agree", "uncertain", "disagree", or "strongly disagree", with 5-points for "strongly agree" and 1-point for "strongly disagree", and participants were directed to

circle the face that best matched their opinion about each of the statements. It was stressed that answering honestly was very important and that it was not a test.

Independent Variable & Instruments

The independent variable in this study was the VSM video that was individually created for each participant showing them reading fluently and confidently. The videos were produced by the researcher by recording each student reading aloud and then editing the videos to show fluid reading. This was accomplished by removing all footage of pauses, incorrect responses, mispronunciations, unwanted mannerisms, and researcher prompting (Buggey & Hoomes, 2011; Collier-Meek, Fallon, Johnson, Sanetti, & Delcampo, 2012).

The researcher administered the VSM intervention sessions, which consisted of the participants independently viewing their videos after being instructed in how to watch them closely and with full-attention. The final VSM reading videos were two minutes in length and were watched by the participants five days a week during regular classroom instruction, and accessed via a classroom desktop computer.

Creating the VSM reading videos. A reading passage from the classroom curriculum was selected for each participant at the student's goal-level. Participant goal-level was determined prior to the start of the study and was slightly higher than instructional-level. In order to produce the desired outcome of fluid reading, participants were video recorded echo reading and imitating the researcher's modeling. To implement the strategy of echo reading, the participant and researcher each had a copy of the same selected reading passage. The researcher, acting as model, read a few words of text with expression, enjoyment, and at the desired pace. The participant followed along silently with the text while listening to the researcher read (Buggey, 2005). It was then the participant's turn to read aloud the same words, while imitating

the way in which the researcher read the text. Later all evidence of the researcher's presence was deleted from the video (Collier-Meek et al., 2012; Decker & Buggey, 2014; Greenberg et al., 2002).

Video introduction/ending. The researcher again modeled the actions that were desired for the videos. At the video opening, participants were instructed to smile and introduce themselves, saying: "Hi! This is my reading video and I'm going to read now." Participants were then instructed to begin reading and the researcher indicated when it was time to stop reading. The videos concluded with participants smiling and the phrase, "Thanks for watching my video!"

Video sound/visual effects. At the beginning and end of the videos, audiovisuals of animated clapping and cheering were included, as well as text such as "Excellent Reader!" or "Great Reading!". This was produced using the sound and visual effects libraries in the iMovie software and added while editing the video clips.

Equipment. The VSM videos used in this study were created using a Kodak Zi6 video camera/Sunpack tripod kit and edited using iMovie software.

Dependent Variable & Instruments

The primary dependent variable in this study was establishing oral reading fluency rates for each participant, using CBM data probes to calculate Word Correct Per Minute (WCPM) scores for each session. WCPM was determined in a three-step process:

1. Each participant read aloud from two different but equal passages from the classroom reading curriculum at instructional-level, during timed reading of one-minute per probe. The total number of words read from the two passages in the allotted time were added together, with

each word assigned a one-point value. The total was then averaged to determine the Word Per Minute (WPM) calculation.

2. Any Errors Per Minute (EPM) that were made by the participants during their two readings were subtracted from their WPM calculation. EPM consisted of a one-point deduction for the following: insertions of words, substitutions, mispronunciations, omissions, self-corrections and hesitations during reading (Good & Kaminski, 2002). The researcher and teacher recorded all errors over the correct word printed in each passage.

3. The EPM was then subtracted from the WPM to produce the final WCPM calculation.

Research Design & Decision Rules

A multiple-baseline-across-participants design was used to evaluate the effects of VSM on oral reading fluency and reader self-perception. There were three phases in the study: baseline, intervention, and maintenance.

Moving between phases. To move from baseline to intervention, the first participant needed at least three baseline data points that were stable. Subsequent participants moved from baseline to intervention when they had at least three data points that were stable, and when the previous participant had shown an increase of 5 WCPM over their baseline mean score. Each participant remained in intervention until they maintained the increase of 5 WCPM for a minimum of three consecutive sessions during the phase. Maintenance probes were administered to each of the participants after the completion of the intervention phase, the results of which were used to determine if increases in WCPM were maintained, and whether any gains were made in oral reading fluency rates following the intervention. During maintenance, participants continued to read passages aloud for two minutes but did not view the VSM videos.

Inter-Observer Agreement (IOA)

Inter-observer data was collected during 25% of all phases for each participant using a CBM Probe Data Collection Checklist (see Appendix C) to determine researcher accuracy in calculating the dependent variable, WCPM. Inter-observer agreement was calculated for each participant by dividing the number of agreements by the number of agreements and disagreements, and multiplying by 100%. The IOA data was rounded to whole number and was 98% for Joe, with a range of 94-100, 99% for Max, with a range of 96-100, and 97% for Rosie, with a range of 93-100.

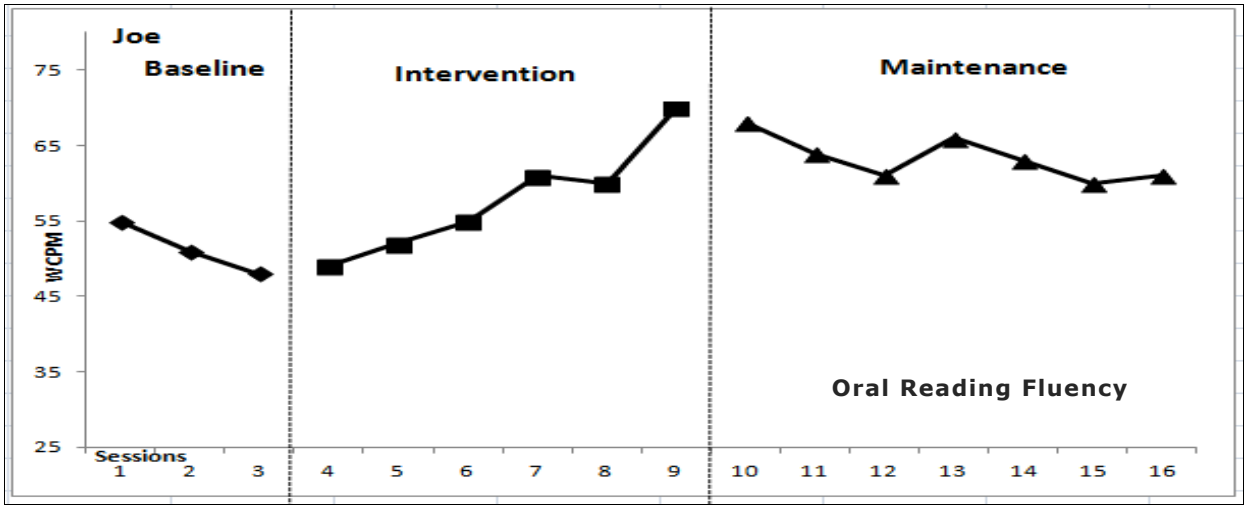
Procedural fidelity. Procedural fidelity was assessed in the form of a checklist in 25% of sessions during intervention using a VSM Reading Video Checklist (see Appendix D). Procedural fidelity was 100% for all three participants.

Social validity. Social validity for participants was assessed via a questionnaire with 4-Likert type scale statements (see Appendix E). The statements were related to VSM and reading. Results indicated Joe and Max liked being part of the study, enjoyed watching themselves on video, thought the VSM helped them, and felt that they could read better at the end of the study. Rosie was undecided if she liked being part of the study, watching herself on the video, and if there was an impact on her ability to read at the end of the study. She was uncertain if watching the video helped her to be a better reader.

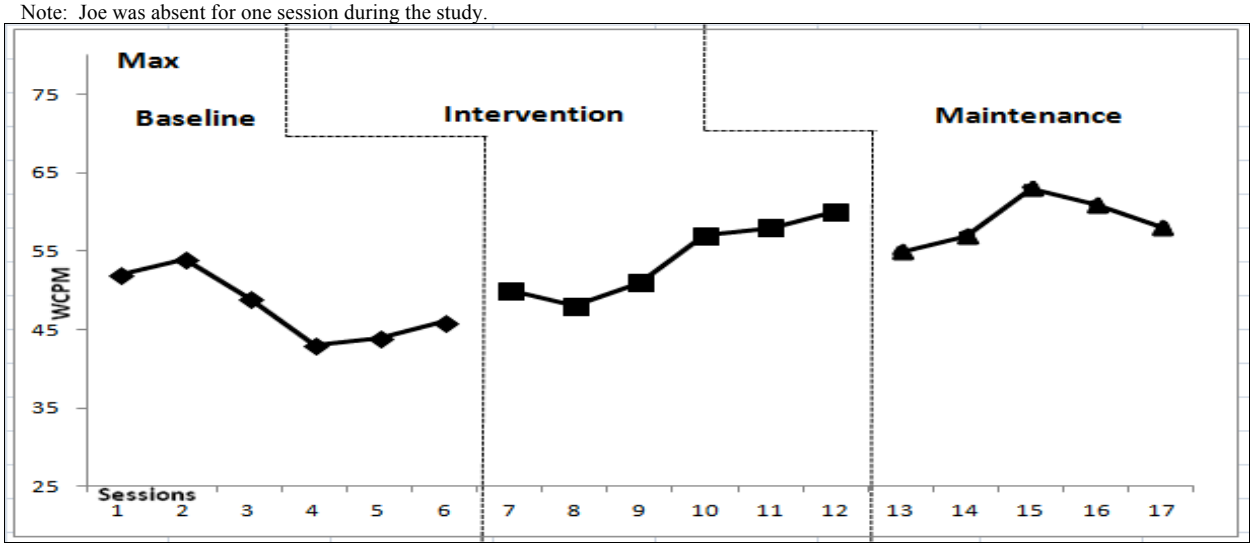
Social validity for the teacher was measured via a questionnaire with 5-Likert type scale statements (see Appendix F). The teacher agreed that the implementation of the study was straightforward and minimally disruptive to the daily routine. Additionally, she agreed that VSM was effective for both oral reading fluency and reader self-perception and that she was likely to use VSM in the future.

Results

Figure 1 below contains graphs depicting WCPM data scores across phases for all three participants. The first tier depicts WCPM data for Joe showing a steady and sure rise in oral reading fluency rates during VSM intervention. The second tier of Figure 1 depicts WCPM data for Max showing a more gradual but increasing trend during VSM intervention. The third tier depicts WCPM data for Rosie with a slower but continuously upward trend during VSM intervention.



Note: Joe was absent for one session during the study.



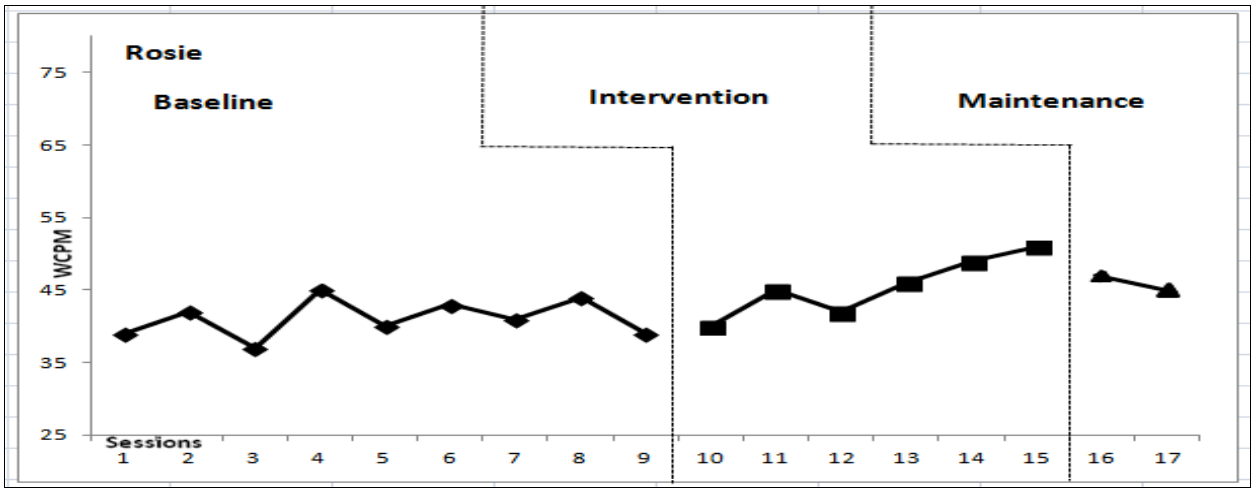


Figure 1. *Participant Oral Reading Fluency/WCPM Data Scores Across Phases*

Joe's mean WCPM score during baseline was 51. During VSM intervention his WCPM increased to 58, and continued to increase to 63 during maintenance. Joe's PND from baseline through intervention phase was 50% and from baseline through maintenance phase was 77%. Max's mean WCPM score during baseline was 48. During VSM intervention his WCPM increased to 54, and continued to increase to 59 during maintenance. Max's PND from baseline through intervention phase was 50% and from baseline to maintenance phase was 73%. Rosie's mean WCPM score during baseline was 41. During VSM intervention her WCPM increased to 46, and stayed at 46 during a short maintenance phase of two sessions. Rosie's PND from baseline through intervention phase was 50%, and from baseline through maintenance phase remained at 50%.

Reader self-perception. Participant scores for the survey statement categories were interpreted using the scale set by the RSPS (Henk & Melnick, 1995). Because of the moderate to severe disabilities of the participants in this study, the scores were displayed in percentages of increase or decrease from pre- and post-survey results and not rated as "high, average, and low" as outlined in the original survey scoring guide. This was because participant scores rarely met even the "low" category ratings. Reader self-perception scores of the participants are presented

in Table 1. All survey responses denoted an overall positive improvement after intervention in how the participants viewed themselves as readers.

Table 1. *Participant Reader Self-Perception: Modified Reader Self-Perception Scale (RSPS)*

	General Perception Statements		***+/- %***	**Progress Statements**		***+/- %***	**Observational Comparison Statements**		***+/- %***	**Social Feedback Statements**		***+/- %***	**Psychological States Statements**		***+/- %***
Joe	Pre 40%	Post 80%	+ ***40%***	Pre 45%	Post 70%	+ ***25%***	Pre 65%	Post 75%	+ ***10%***	Pre 44%	Post 68%	+ ***24%***	Pre 60%	Post 76%	+ ***16%***
Max	Pre 80%	Post 80%	+ ***0%***	Pre 60%	Post 80%	+ ***20%***	Pre 55%	Post 75%	+ ***20%***	Pre 64%	Post 72%	+ ***8%***	Pre 40%	Post 64%	+ ***24%***
Rosie	Pre 20%	Post 60%	+ ***40%***	Pre 40%	Post 65%	+ ***25%***	Pre 40%	Post 55%	+ ***15%***	Pre 40%	Post 60%	+ ***20%***	Pre 48%	Post 64%	+ ***16%***

Note: Modified from The Reader Self-Perception Scale (RSPS), Henk & Melnick (1995).

In response to survey statements, Joe increased reader self-perception 40% in General Perception, 25% in Progress, 10% in Observation Comparison, 24% in Social Feedback, and 16% in Physiological States. Max showed no increase in General Perception, increased reader self-perception 20% in Progress, 20% in Observation Comparison, 8% in Social Feedback, and 24% in Physiological States. Rosie increased reader self-perception 40% in General Perception, 25% in Progress, 15% in Observation Comparison, 20% in Social Feedback, and 16% in Physiological States.

Discussion

The purpose of this study was to examine the impact of VSM on the oral reading fluency of three high school students in the moderate to severe special day class setting. The study also examined whether any improvements from the VSM intervention were sustained after the maintenance phase ended, and whether there was an impact on the reader self-perception of the participants. The present study extends the research on VSM and oral reading fluency by looking at how it impacts older participants with moderate to severe learning disabilities in the special education setting.

The results are mixed regarding the success of VSM for oral reading fluency for the three participants as evidenced by the observational measurement of WCPM data scores and PND analysis. One of the three participants, Joe, experienced larger increases in oral reading fluency rates but the other two participants, Max and Rosie, showed improvement as well. In all cases, mean WCPM scores during intervention were higher than those during baseline. During VSM intervention, the mean WCPM scores increased an average of 7 WCPM for Joe, 6 WCPM for Max, and 5 WCPM for Rosie.

PND analysis of the intervention phase of this study indicated it did not meet the requirements for very effective intervention, nor for effective intervention, therefore, the intervention may be interpreted as questionable. Scruggs and Mastropieri (2001) indicated PND scores of 90% and over as very effective interventions, 70-90% as effective interventions, 50-70% as questionable, and scores below 50% as ineffective (Montgomerie et al., 2014). It is unknown if the participants in this study took longer to show gains during intervention because of disabilities, if scores were lower due to the relatively short duration of the study or due to other flaws. Interestingly, critics of the PND approach indicate it may not accurately reflect

treatment changes if there is a high "fluke" score during baseline which then limits the number of usable points (Martella Nelson, Morgan, & Marchand-Martella, 2013).

All in all, WCPM data scores from this study corroborated previous findings that VSM is an intervention that can improve oral reading fluency rates (Decker & Buggey, 2014; Greenberg et al., 2002; Montgomerie et al., 2014; Robson et al., 2015). Furthermore, findings indicated that all three participants in the present study maintained their oral reading fluency rate increases from the VSM intervention in that none of the students returned to baseline mean scores and all remained at least 5 WCPM over those measurements when the study ended. It should be noted however that the maintenance phase of the present study was brief and did not allow for extensive follow up probes over time.

Hitchcock et al. (2004) demonstrated that increases in reading fluency were maintained at the one and six-month mark. However, Montgomerie et al. (2014) found that participants did not maintain the increases in oral reading fluency following the withdrawal of intervention. This may suggest that although VSM can improve oral reading rates in the short-term, the effects may not be maintained over longer periods of time. Determination of whether or not effects are maintained is especially important for the special education population because time and resources are limited and the best interventions with the highest probability of maintenance and generalization should be undertaken to improve reading skills. There are so few long-term studies that include generalization of VSM and oral reading fluency that more research is needed to truly understand this phenomenon.

In addition to studying the impact of VSM on oral reading fluency, pre- and post-survey results may indicate that VSM positively impacted reader self-perception in all three of the participants. Joe appeared to enjoy participating in the study from beginning to end and seemed

to enjoy watching his video. Max appeared to be initially interested in the study, but became less enthusiastic about watching his video as the intervention progressed, which may have impacted results. During intervention, a procedural checklist was implemented that did not include asking participants about feelings or personal input during the sessions, so the impression of a decline in interest was made by watching body language. As the study progressed the newness may have worn off for Max and other classroom activities he was missing out on become of more interest.

Rosie appeared disinterested and reluctant to participate from the beginning and did not show any eagerness to watch her video at any point in time. This may be because Rosie has autism with a rigid fixation on fire trucks, firemen, and fires. Any other topic did not appeal to her. Rosie showed fewer increases than the other participants and also rated the intervention as less acceptable which may indicate that her self-perceptions were more strongly-rooted or the duration of the study not sufficient to greatly impact them. She also read in a flat, monotone tone of voice and may not have liked seeing herself read aloud. Participants were asked to model prosody and facial expressions of the researcher during filming but Rosie was not yet able to do so.

There are a multitude of reasons why older students may not enjoy this intervention as much as it is reported that younger students do (Buggey 2005, 2007; Buggey & Hoomes, 2011). For example, some older students may be uncomfortable viewing videos they are in, especially if classmates can see this or perhaps comment on it. Another reason may be that some learners require more time to become used to such an intervention and to see themselves on a computer monitor. In addition, reading is a documented challenge for these participants and it may be that targeting this skill stirred up negative feelings or anxiety about reading. It might be beneficial to examine if some students might benefit from a more gentle introduction to self-modeling and not

be put directly in front of a computer screen on day one of an intervention without warning as to how they might appear in the video.

One implication for participants in VSM intervention is that the videos provide frequent instruction and exposure to positive reading experiences in the classroom that can be of a less intrusive nature - if students are provided a private area in which to view themselves fluently reading. Additionally, even though videos are tailor-made for each student, and therefore take time to produce, it might be of value to make several, or at the least, one additional video for each participant, to keep interest alive during intervention, and to offer variety and prevent restlessness from occurring. VSM intervention also has implications for teachers, in that once the videos *are* created, they may be rotated and utilized repeatedly until the student has met their goal reading level as portrayed in the videos. With limited teacher resources, having recorded interventions readily available provides a very useful resource despite the initial time spent filming and editing the videos.

Limitations and Future Directions

This study took place in one classroom with limited participants and for a short duration. There was a limited baseline session for one of the participants, which can effect claims regarding a functional relationship between the independent and dependent variable. Another limitation was the length of the maintenance phase, which was especially short for one participant. If it is to be known whether or not the impact of the VSM intervention is generalized, a longer study and follow-up period would be necessary.

Another limitation was the lack of privacy for the participants. In a perfect setting, the participants should have viewed their VSM videos and read for data probes in a separate room, as this might have aided in participant attention and reduction of peer interest, however, this was

not available. Students not participating in the study were able to turn around and view the participants working in the back of the room. This peer interest may have caused embarrassment to the participants and affected results.

Yet another limitation of this study was the amount of time it took to become familiar with the editing technology and then to create quality videos for use during the intervention. After filming, each video took over 3 hours to create for each participant. Researchers have outlined limited time, skills and access to technology as reasons why VSM has not been widely implemented within the school setting (Bellini & McConnell, 2010; Collier-Meek et al., 2012)

Future research should equally include all elements that comprise oral reading fluency. Although the NRP's (2000) definition of fluency includes accuracy, speed, and prosody, the present study concentrated on improving participant oral reading fluency rates and was unable to impact meaningful expression such as stress, pitch or intonation in one participant with difficulty in this area using modeling of the researcher or choral reading techniques. Also participants in this study were not assessed for understanding of what they were reading so the connection between fluency and comprehension was not investigated; as comprehension is the ultimate goal of efficient reading, it is essential that future research center on the impact that any newly acquired fluency has on comprehension.

To date there have been only a handful of published studies using VSM to increase oral reading fluency, even fewer undertaken in the special education setting, and fewer still that have specifically examined reader self-perception. Further research should also highlight the use of VSM to improve oral reading fluency and reader self-perception using a larger sample of students with more variety of learning disabilities and for longer intervention and maintenance periods to improve the generality of the results.

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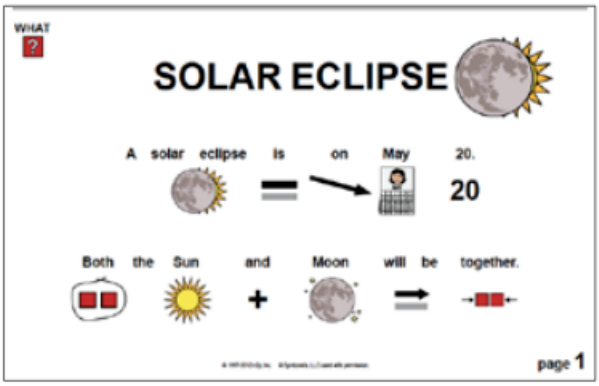
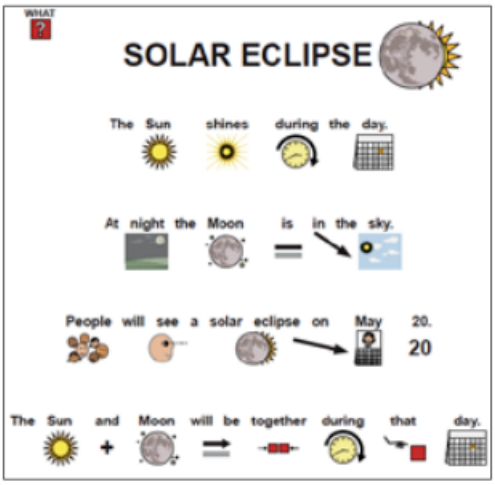
Appendix A

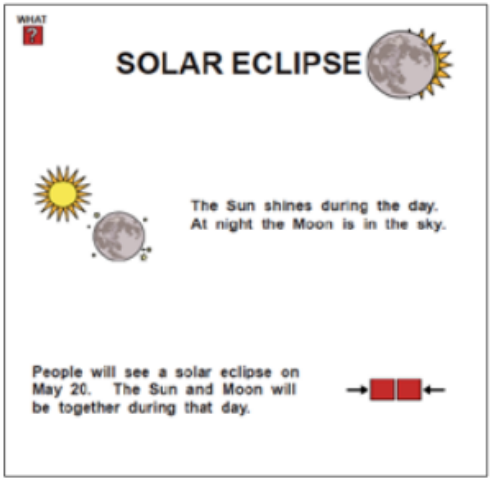
Unique Learning System: Classroom Curriculum Levels



Simple Edition



Regular Edition



Higher Edition

Advanced Edition

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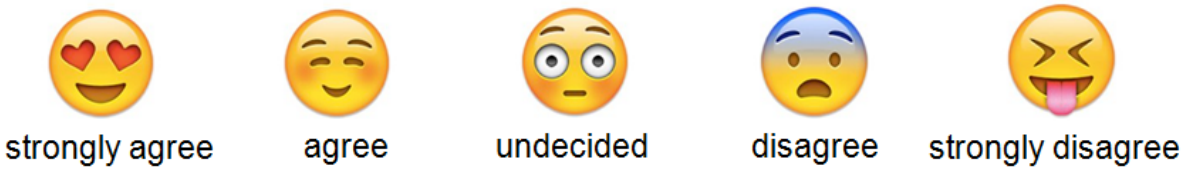
Appendix B

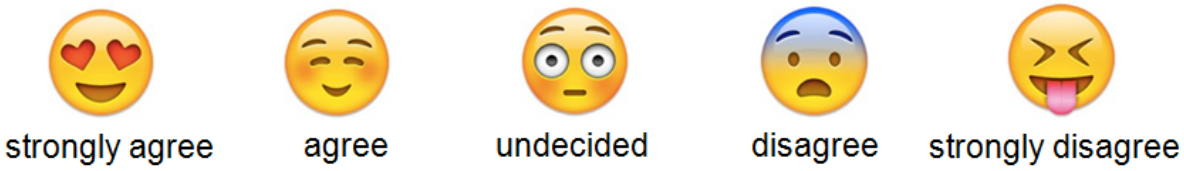
Modified Reader Self-Perception Scale

I am going to read some statements about reading with you. Circle the face that best matches your answer.

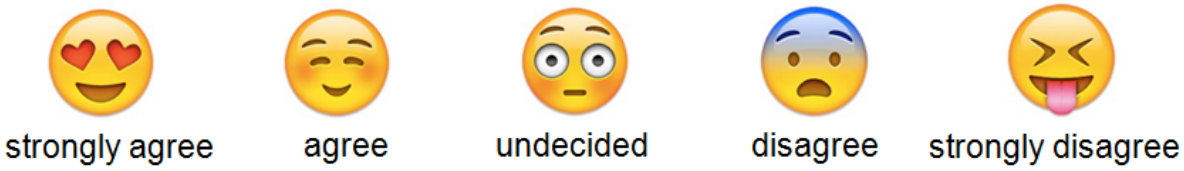
1. I think I am a good reader.



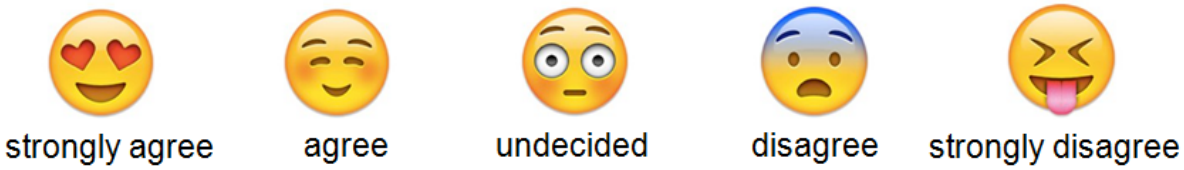
2. My teachers think that my reading is fine.



3. I read faster than other kids.

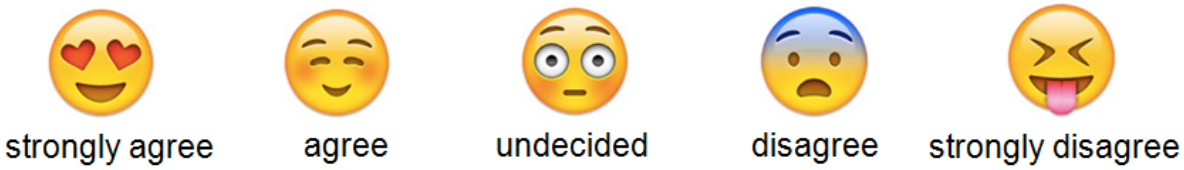


4. I like to read aloud.

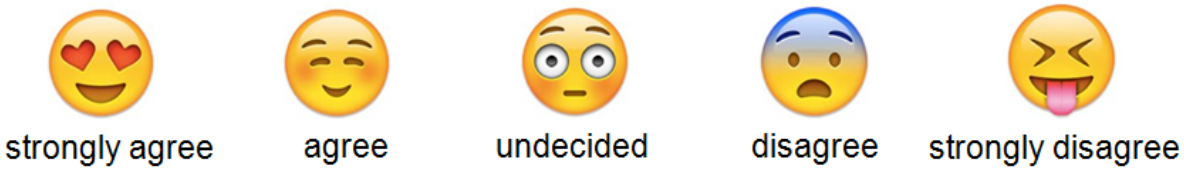


Modified from The Reader Self Perception Scale (Henk & Melnick, 1995)

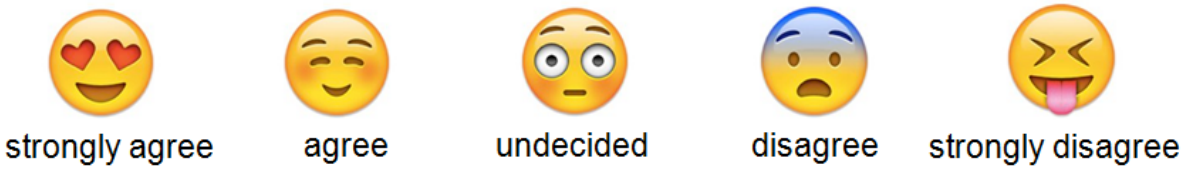
5. When I read, I can figure out words better than other kids.



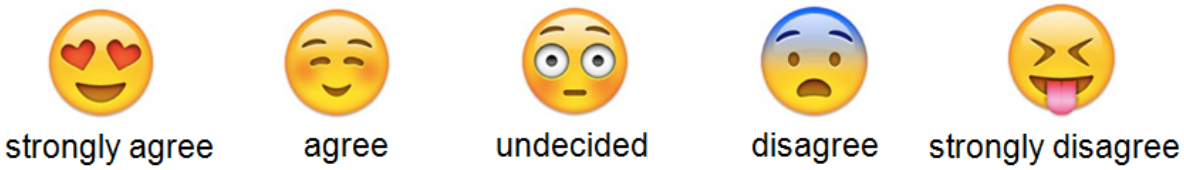
6. I feel good inside when I read.



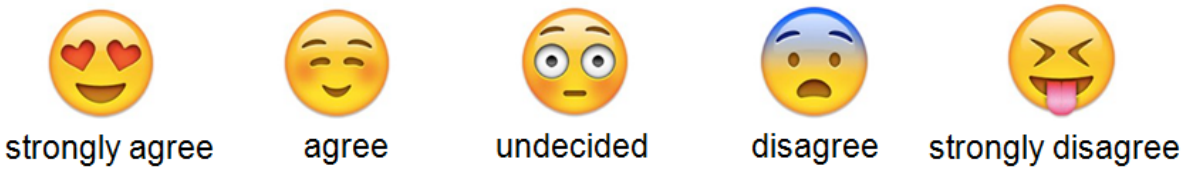
7. My classmates think that I read pretty well.



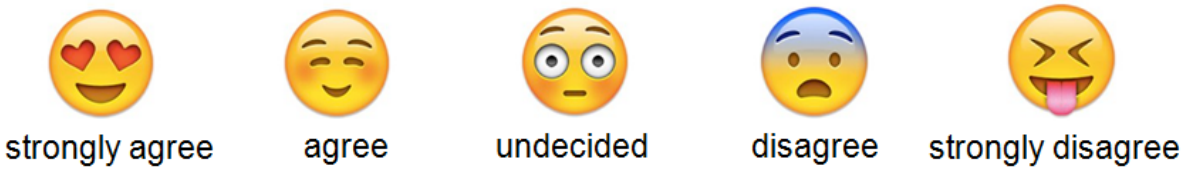
8. People in my family think I am a good reader.



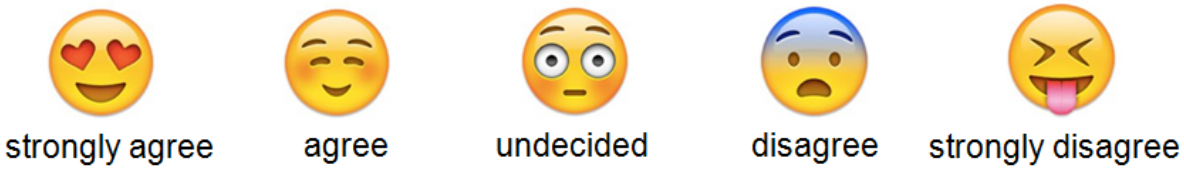
9. I am getting better at reading.



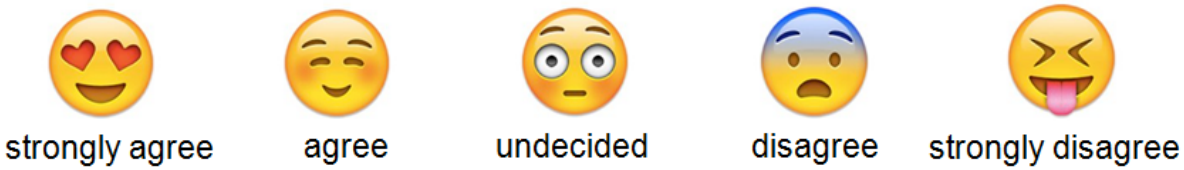
10. I understand what I read as well as other kids do.



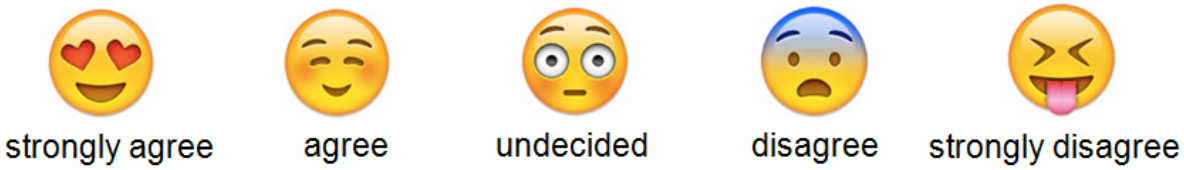
11. When I read I need less help than I used to.



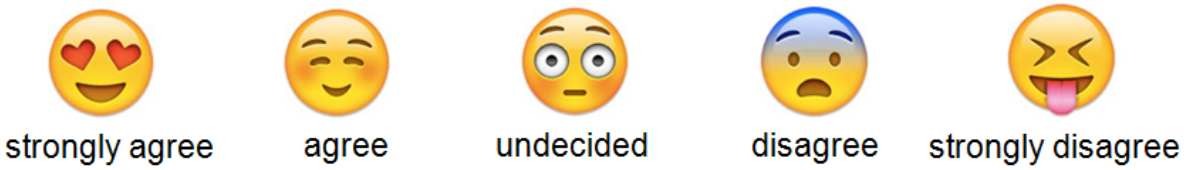
12. Reading makes me feel happy inside.



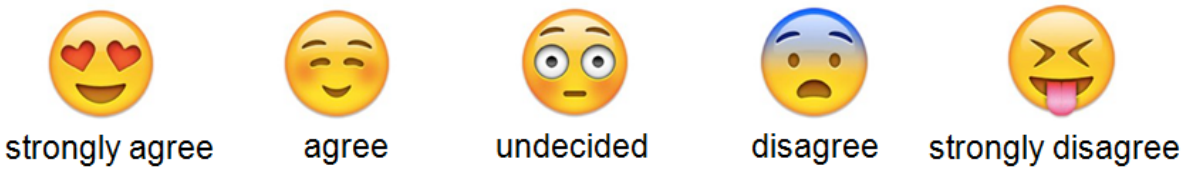
13. Reading is easier for me than it used to be.



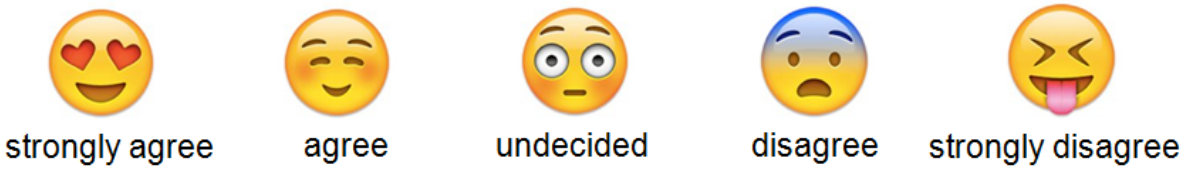
14. I read better than other kids in my class.



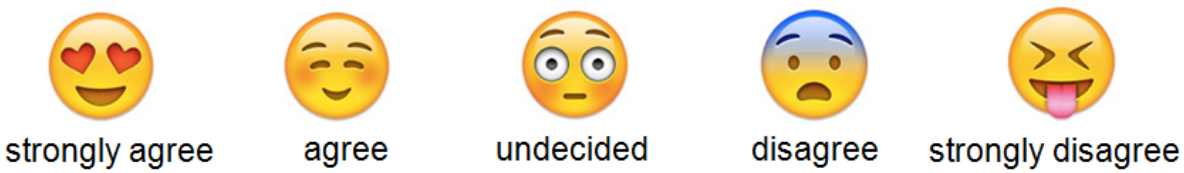
15. I feel comfortable when I read.



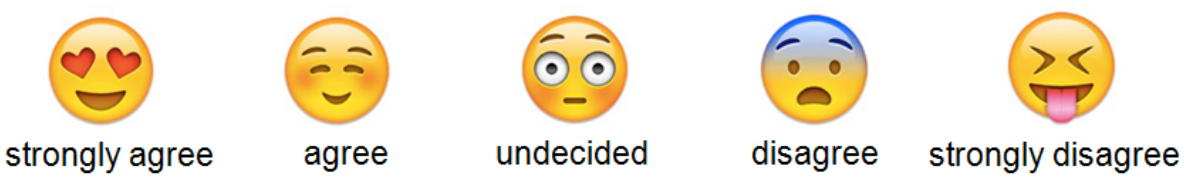
16. I read better now than I could before.



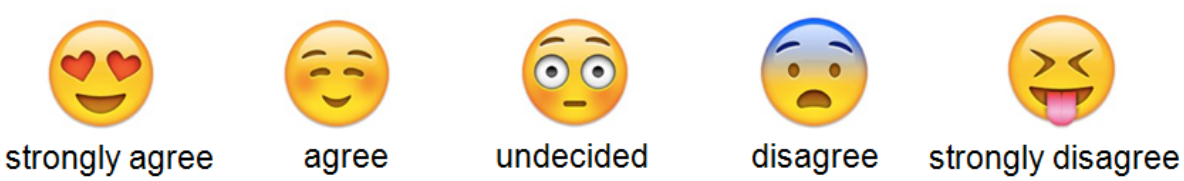
17. Reading makes me feel good.



18. Other kids think I am a good reader.



19. People in my family like to listen to me read.



Appendix C

CBM Data Probe Collection Checklist

CBM probe administered after viewing VSM reading video?	
Participant begins reading when prompted?	
Participant reads passage for one minute?	
Student is prompted to stop reading the passage?	
Distractions or other behavior or circumstances?	
WCPM and EPM calculated for the probe?	
WCPM =	
WPM =	
EPM =	
Participant 1, 2, or 3?	
Session No. =	

Appendix D

VSM Reading Video Checklist

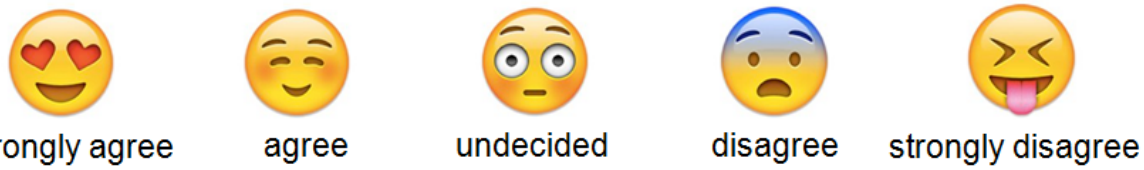
1. Turn on the desktop computer.	
2. Locate the participant's VSM Reading Video and enter password.	
3. Tell participant it is time to watch their video.	
4. Seat participant, assist with headphones, and start the video.	
5. If participant becomes inattentive, instruct him/her to please watch their video.	
6. When participant finishes watching the video, close link/folder to maintain confidentiality.	
Distraction for participant during viewing VSM?	
Other behaviors or circumstances?	
Participant 1, 2, or 3?	
Session No. =	

Appendix E

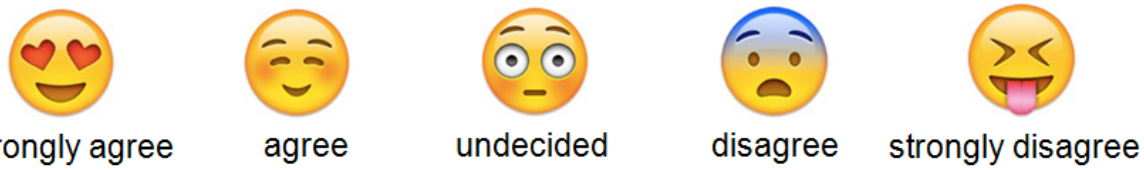
Participant Social Validity Questionnaire

I am going to read some statements about the study you took part in. Circle the face that best matches your answer.

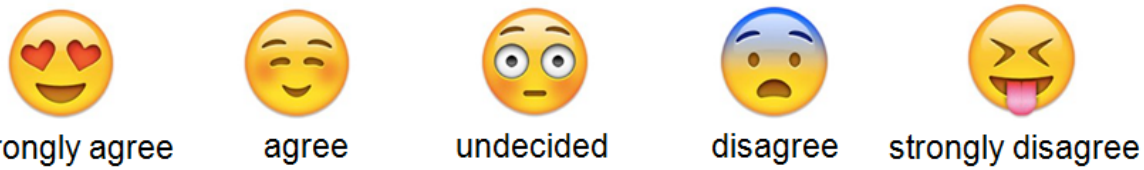
1. I liked being a part of this study.



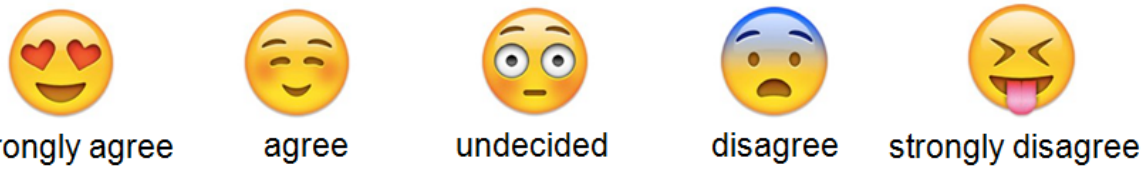
2. I enjoyed watching the reading video of myself.



3. Watching the reading video helped me to be a better reader.



4. I feel better about reading now than I did before this study.



Appendix F

Teacher Social Validity Questionnaire

Please rate each of the following areas of this study by circling one response per statement:

1. Implementation of the study was relaxed and straightforward.

strongly agree agree undecided disagree strongly disagree

2. Implementation of the study was minimally disruptive to the regular classroom activities.

strongly agree agree undecided disagree strongly disagree

3. The video self modeling (VSM) intervention was effective in increasing participant oral reading fluency.

strongly agree agree undecided disagree strongly disagree

4. VSM intervention was effective in improving participant reader self-perception.

strongly agree agree undecided disagree strongly disagree

5. I am likely to use VSM intervention in the future.

strongly agree agree undecided disagree strongly disagree