January 2015

Reading in the Digital Era: Using Video Self-Modeling to Improve Reading Fluency in At-Risk Students

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Reading in the Digital Era: Using Video Self-Modeling to Improve Reading Fluency in At-Risk Students

by

Monica Anestin

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts in Applied Behavior Analysis Department of Child and Family Studies College of Behavioral and Community Sciences University of South Florida

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Date of Approval: June 29, 2015

Keywords: reading intervention, oral reading, fluency intervention, Tier 3 reading intervention

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Abstract

Reading fluency bridges the concepts of word recognition and reading comprehension, both of which are vital skills needed to become a successful reader. This study evaluated the impact of video self-modeling (VSM) on oral reading fluency in four upper elementary students at-risk for failing in reading. A multiple-baseline design across participants was used to evaluate the outcomes of the VSM intervention. The results indicate that VSM may have a positive impact on reading fluency of students at-risk for reading failure; the use of VSM was positively associated with increases in reading fluency in three of the four participants. The participant for whom VSM alone did not result in substantial reading gains needed an additional repeated reading intervention to improve fluency. Generalization occurred for all participants and some evidence of maintenance was noted in three participants. Social validity surveys indicated high acceptability of the VSM intervention by study participants.
Chapter 1:
Introduction

For students, the ability to read is an essential skill for both academic and social advancement (Fletcher, Nicholas, & Davis, 2011). In addition, reading successfully affects the self-esteem of the reader, as well as opportunities for employment and advanced learning (Shaywitz et al., 2003). Students with reading difficulties have a high probability of engaging in problem behavior and dropping out of school when compared to students who do not demonstrate difficulties in reading (National Institute for Literacy, 1997). Therefore, it is critical that effective interventions be identified for students struggling with reading.

In a meta-analysis of studies on reading instruction, the National Reading Panel (NRP; 2000) delineated phonemic awareness, phonics, vocabulary, fluency, and comprehension as five critical areas for reading instruction. To be a successful reader, one must excel in all five of these areas of literacy. Despite all five areas being essential for student success, reading fluency has seldom been targeted in reading programs (Kame’enui & Simmons, 2001), which may result from a lack of training on reading fluency during teacher in-service training (Zutell & Rasinski, 1991).

Reading fluency is defined as reading a text with automaticity/speed, accuracy, and prosody (NRP, 2000; Stecker, Roser, & Martinez, 1998). Automaticity is noted as the precursor to reading fluency and refers to quickly and correctly recognizing words in a text (Morris,
Accuracy is defined as deciphering words easily when reading (Fuchs, Fuchs, & Maxwell, 1988), and prosody involves pitch, phrasing, rhythm, intonation, as well as stress and pausing in words/sentences (Hirschberg, 2002). Prosody allows the reader to develop a link between text and oral language which in turn leads to better reading comprehension for the student (Kuhn & Stahl, 2003).

Reading fluency has been identified as the bridge that leads to reading comprehension (Perfetti, 1985). As such, reading fluently is necessary for student academic success (Fuchs & Fuchs, 1992; Snow, Burns, & Griffin, 1998). Fuchs et al. (1988) also demonstrated that increasing oral reading fluency lead to improvements in reading comprehension. Given that fluent reading leads to comprehension, the NRP (2000) stressed that if students do not develop oral reading fluency, they are likely to remain poor readers. Osborn, Lehr, and Hiebert (2003), further expressed the need for instruction in reading fluency by suggesting that perseverating on words while reading hinders comprehension of the text.

Research indicates that interventions such as repeated reading and guided reading have been successful in increasing reading fluency of elementary students with reading difficulties (Daly, Martens, Kilmer, & Massie, 1996; Kamps, Locke, Delquadri, & Hall, 1989; Therrien & Kubina, 2006). Repeated reading is a strategy used to build fluency skills by having students reread a text several times (Kuhn & Stahl, 2003). Guided reading is a reading strategy that consists of teachers choosing texts at student levels, reading aloud with students, helping students to decipher words, and correcting student reading errors (Mostow, Nelson-Taylor, & Beck, 2013). Although both repeated reading and guided reading have been successful for increasing reading fluency (Rasinski et al., 2005), these interventions are often costly and time consuming (Mostow, et al., 2013). As guided reading occurs within small, teacher-led groups, it
is likely that other students within the groups may lack patience for struggling readers and teachers may be too busy to devote the time needed for these interventions (Mostow et al., 2013). Thus, there is a need to identify less time consuming interventions for reading fluency.

An alternative to these traditional interventions for reading fluency is video self-modeling (VSM; Dowrick, 1999). VSM is defined as a person observing and learning from his or her own desirable behavior (Buggey & Ogle, 2012). To create such a video, the individual learners are recorded engaging in a desired behavior, usually with prompts, to ensure that they can produce the appropriate response. All instances of prompting and displays of the learner emitting an undesired behavior are then edited out. After the editing process, the learners view themselves engaging in the target behavior without making any mistakes (Collier-Meek, Fallon, Johnson, Sanetti, & Delcampo, 2012).

With the availability of technology equipment in schools today, VSM may be a less costly and time-consuming intervention for teachers to implement compared to traditional interventions such as repeated reading and guided oral reading fluency. For example, Lightfoot (2005) reported that the integration of technology in the classrooms assists in lessening the cost and delivery of education, while also producing a more portable and lasting product. An added benefit of using VSM versus other reading interventions is that VSM videos produce a permanent product that can be viewed continuously without teacher assistance, which allows the teacher to continue providing instruction to other students.

In a study advocating for the use of VSM interventions in schools, Bellini and McConnell (2010) found that videos could be created using cameras on school assigned equipment, with each video taking less than 1-hour to complete, even for those inexperienced with producing videos. Depending on the target behavior, the editing process can be relatively fast. Bellini and
McConnell (2010) suggested that the intervention would take minutes to implement. Therefore, although it may take time to create the initial videos for a VSM intervention, the efficiency and effectiveness of the intervention may be greater than those of more traditional interventions for reading fluency.

VSM has been used as a successful intervention for an amalgam of behaviors such as on-task behaviors (Clare, Jenson, Kehle, & Bray, 2000), classroom participation (Hartley, Kehle, & Bray, 2002), and functional skills (Lasater & Brady, 1995). For example, Lasater and Brady (1995) evaluated the effectiveness of VSM for teaching functional skills (shaving, making a sandwich, hanging clothes in closet, and making a bed) to two 14 and 15 year old adolescents diagnosed with autism. The VSM intervention included four videos of the participants performing the target behaviors correctly without assistance. The results indicated the VSM intervention was successful for teaching both participants the functional skills.

Clare et al. (2000) incorporated a VSM intervention within a school setting by investigating the effects of VSM on increasing on-task behaviors of three male students with disabilities in a self-contained classroom. During the intervention, the researchers recorded when students stayed on task and worked on assigned classwork. The videos were then edited to efface any instances when the students were not displaying the target behaviors. After the videos were edited, they were shown to the students as a positive self-model. The results indicated considerable increases in on-task behavior. Hartley et al. (2002) extended these findings by using VSM to increase classroom participation behaviors (raising hands in class and answering questions correctly in Language Arts) for five third grade general education students. The students were first filmed engaging in these target behaviors and then shown the videos prior to instruction in Language Arts. The results indicated that class participation increased from 11% in
baseline to 43% in intervention. These skills were maintained six weeks following the intervention.

A few studies have expanded the use of VSM in school settings by assessing the effects of this intervention on reading fluency (e.g. Bray, Kehle, Spackman, & Hintze, 1998; Dowrick, Kim-Rupnow, & Power, 2006; Hitchcock, Prater, & Dowrick, 2004; Montgomerie, Little, & Akin-Little, 2014). Bray et al. (1998) investigated the use of VSM for teaching oral reading fluency to five third grade general education students who experienced difficulties with reading. The intervention was held across four weeks and involved the students viewing a 5min video of themselves reading 10-15 words. The results indicated that VSM increased student oral reading fluency and the skills were maintained at the 8-week follow-up.

Dowrick et al. (2006) compared the effects of VSM plus tutoring and tutoring alone on reading fluency of 10 first grade students at-risk of academic failure. The intervention was held across two weeks and involved the use of 2 min self-modeling videos of the children reading fluently. The results indicated that VSM plus tutoring resulted in greater levels of oral reading fluency when compared to tutoring alone. Montgomerie et al. (2014) expanded the literature by using VSM as a stand-alone intervention for four, third grade general education students who were not making adequate gains in reading. During the intervention, the students viewed videos of themselves reading fluently before school for two weeks. Data from this study demonstrated that VSM increased the oral reading fluency of all four students.

Based on the results discussed above, VSM is a promising intervention that can be used in school settings (Prater, Carter, Hitchcock, & Dowrick, 2012). However, the vast majority of studies on VSM targeted children with autism spectrum disorders, and its use as a stand-alone intervention to improve reading and literacy has been limited (Decker & Buggey, 2014). The
study carried out by Montgomerie et al. (2014) remains the only published study that examined the use of VSM as a stand-alone intervention for increasing oral reading fluency, and none has addressed fourth and fifth grade general education students at-risk for reading failure. Furthermore, none of the research on VSM and reading fluency has investigated children’s attitude towards reading. Children’s attitudes towards reading may contribute to self-identification as poor readers and less involvement in reading related activities (Nathan & Stanovich, 1991). Research indicated that elementary students’ self-concept in reading showed significant correlations with reading achievement (Chapman & Tunmer, 1995), and students with low reader self-perception performed lower on reading assignments than their counterparts (Chapman, Tunmer, & Prochnow, 2000).

These findings suggest that further research should be conducted to assess the potential efficacy of VSM for oral reading fluency and its impact on reader self-perception in students at-risk for reading failure. Therefore, the purpose of this study was to extend the VSM literature by addressing the following questions: (a) to what extent will VSM improve the reading fluency of elementary students at-risk for reading failure in a general education setting; (b) to what extent will reading skill acquisition generalize to novel passages, and the generalized reading skills be maintained at follow-up; and (c) to what extent will the VSM intervention impact the way the students view themselves as readers?
Chapter 2:  
Method

Setting

This study took place at a public elementary school (Pre K-5th grade) in an urban district in Florida. The school had a population of 352 students and was a Title I school with 89% of the students enrolled receiving free or reduced-price lunch. The specific demographics of the student population were 46% Caucasian, 26% African-American, 22% Latino/Hispanic, and 6% multiracial students. During the time of the study, the school provided special education services to 13% of the students. The Florida Comprehensive Assessment Test (FCAT) in reading during the 2013-2014 academic year indicated that the percentage of students performing at a satisfactory level and above in reading were 41%-44% for students in grades three through five indicating the need for increased reading interventions to assist these students with making gains in reading.

Participants

Participants in this study included four students in grades four and five who were enrolled at the elementary school. Inclusion criteria for study participants included students who: a) were aged 9-11; b) performed at or below the 20th percentile in reading; c) did not engage in inappropriate behaviors, defined as having no more than two documented Classroom Behavior Tracking Forms and no Office Discipline Referrals (ODRs) for the current school year; d) did
not receive special education services; e) did not have a history of excessive tardiness or absences; and f) had signed parental consent to participate in the study. Students were excluded from the study if they did not meet all of the inclusion criteria. Three classroom teachers who served the participating children provided social validity data.

The targeted students were selected based on a four-step process. The first step involved the principal investigator (PI) meeting with the school psychologist to obtain the names of students in grades four and five who were performing at or below the 20th percentile in reading on Easy CBM (Alonzo, Tindal, Ulmer, & Glasgow, 2006), a curriculum-based reading assessment instrument used by the school district as a progress monitoring tool. In the second step, the PI checked the names of the students against the inclusion criteria and generated a list of students who met the requirements for the study. During the third step, the PI met briefly with the students’ teachers and interviewed them about the students’ performance in reading to confirm their difficulties in reading. During this phase, the PI reviewed an information packet that contained a description about the purpose of the study and the procedures involved to determine whether or not the teacher wanted to participate in the research. Interested teachers were given an informed consent form, which was verbally reviewed with them.

In the final step, once the teacher agreed to participate, the PI sent a flyer with a brief explanation of the study home to the first four students who met the inclusion criteria. The bottom of the flyer included an option for parents to check whether or not they were interested and would like to be contacted, these forms were returned by the students. When flyers were returned with a check mark next to “yes, contact me”, the PI contacted the legal guardians to schedule a time to review the informed consent. The parental consent form was verbally reviewed with the parents and they were advised to take their time deciding and to return the form to the PI
within a week if they wanted to participate. Parents were also informed that they could contact the PI at any time via cell phone or email with questions about the study and/or their child's voluntary participation.

Micha was a 10-year-old Caucasian female in the fourth grade, who had been previously retained. According to the interview with Micha’s teacher, she was selected as a good fit for the study because she was struggling in the areas of reading fluency and reading comprehension. FCAT scores for the 2013-14 school year indicated that she scored Level 1 on Reading and Mathematics placing her below grade level. The FCAT is scored using Levels 1 through 5 with Level 1 being an inadequate level of success and Level 5 being mastery level.

Nikki was a 9-year-old Hispanic female in the fourth grade identified as being an English Language Learner (ELL), which allowed her to receive accommodations for testing. During the interview with Nikki’s teacher, her teacher stated that Nikki would be a good candidate for the study because having a model of herself performing the desired skill was likely to be beneficial to her as this was an ELL teaching strategy. At the time of the interview, Nikki’s teacher stated that Nikki was demonstrating deficits in the areas of reading fluency, comprehension, and writing. Nikki’s FCAT scores were not available.

Bruce was a 10-year-old Caucasian male in the fourth grade. During the interview with Bruce’s teacher, his teacher stated that Bruce was a very smart student and was very capable of performing well, but he was not motivated to learn and did not take his classwork seriously. His teacher believed that he would benefit from the study because he was not receiving any accommodations and he might benefit from having one-on one interventions. On the 2013-14 FCAT, Bruce scored Level 3 in Mathematics and Level 2 in Reading.
Kenneth was an 11-year-old Multiracial male in the fifth grade. During the interview with Kenneth’s teacher, she stated the Kenneth was a well-behaved student, but he was not consistent with academics. Kenneth’s teacher identified Kenneth as being a match for the intervention because he was struggling with reading fluency and comprehension and was not receiving any additional supports. Kenneth scored Level 1 in Mathematics and Level 2 in Reading on the 2013-14 FCAT.

Teacher one (Micha and Nikki’s teacher) was a Caucasian female in her 30s who had been teaching for four and a half years and teaching at the fourth grade level for two years. She held a Bachelor’s degree in Psychology and took additional college coursework and state assessments to become certified in teaching. The reading strategies this teacher used included graphic organizers, reading with highlighters/text coding, running records, and tracking text.

Teacher two (Bruce’s teacher) was an Asian female in her 40s who had been teaching for nine years and teaching at the fourth grade level for three years. She held a Master’s degree in Education, and her preferred reading strategies were text coding, decoding, comprehension, and inference.

Teacher three (Kenneth’s teacher) was an African-American female in her 40s who had been teaching for 20 years, with the 2014-15 school year being her first year teaching at the fifth grade level. She held a Bachelor’s degree. The reading strategies that she used were small groups, one-on-one sessions with students, fluency interventions, basic sight words, word families, comprehension building, and timed running records.

**Measures and Data Collection**

**Oral reading fluency.** The primary dependent measure was oral reading fluency as measured by words correct per min (WCPM) and errors per min (EPM). WCPM was defined as
words read correctly in one minute, and included self-corrections (saying a word correctly after previously mispronouncing it) and adhering to context (Hofstadter-Duke & Daly, 2011). An example of adhering to context would be if the text says, “She asked for a present”, the word “present” should be pronounced as the noun tense of the word PREZ-ent; it should not be pronounced in its verb tense, pre-ZENT (Bray et al., 1998). The WCPM calculation involved counting the total number of words read in the passage, subtracting the total by the number of errors, and dividing the difference by two (the total number of minutes each participant took to read the passage).

EPM were defined as mispronunciations (using a nonsense word instead of the actual word e.g., “dit” instead of “dip”), substitutions (using another word in place of the word in the text), insertions (adding a word that is not in the passage), omissions (skipping over a word that is in the text), and PI assistance (being told the correct word by the PI). When the student made an error, the observers recorded the incorrect word or beginning letter of the type of error over the correct word written in the passage, this allowed the research team to track what types of errors the students were making. Data on EPM were collected to determine if the number of errors made by the students would decrease as WCPM increased. EPM was calculated by counting the number of errors and dividing that number by two (the number of minutes required to read the passage).

During data collection, the participants were required to read a passage at their instructional level. The passages were randomly drawn from the school’s reading material, Journeys at each grade level, which was also used to create the VSM videos. Passages of 250-300 words were retyped and duplicated. During each session, the individual students were asked to read one of the passages aloud for a maximum of 2 min. Data were collected on total number
of words read correctly and the number of reading errors. Data collection sessions were
conducted 3-5 times per week during regular school hours. These sessions took place in the
intervention room (a conference room that was usually used for meetings, testing, or one-on-one
instruction with resource staff) located on the school campus during one-on-one sessions with
the PI. All sessions were recorded for video editing and scoring.

**Comprehensive Reading Inventory (CRI).** The Comprehensive Reading Inventory
(CRI; Cooter, Flynt, & Cooter, 2007) was used as a supplementary oral reading fluency measure,
which was administered to participants during baseline to assess reading fluency prior to the
intervention and immediately following the intervention to assess gains. The CRI is a criterion-
referenced test designed to determine levels and progress in five reading competency areas:
phonemic awareness, phonics, vocabulary, fluency, and comprehension for students in grades K
through 5. The CRI has demonstrated adequate internal consistency reliability with an overall
reliability coefficient of .85 (Cooter et al., 2007). Of the five reading competency areas, only the
fluency section was used to assess reading fluency. The reading fluency portion of the CRI
required students to read a running record passage orally for 1 min. During this time, the PI
recorded reading errors on a running record analysis grid and then calculated the WCPM to
determine whether the students made gains in oral reading fluency following the intervention.

The CRI was administered by presenting a list of leveled passages containing three
sentences per level. Leveled passages are identified by having the student read from the leveled
sentences two grade levels above their level. For example, if a student is in grade five, leveled
sentence passage starts at grade three. Students continue to read until they make two or more
errors.
**Reading Attitude Survey (RAS).** Prior to baseline and following intervention, participants were asked to complete an adapted version of the Reading Attitude Survey (RAS) (Cooter et al., 2007; see Appendix A) to examine changes in their attitudes toward reading. The RAS was orally administered by the PI. This 8-item survey asked the students to respond to questions of how they viewed themselves as readers. To answer each question, participants were asked to mark one of three different facial expressions (happy, neutral, and sad) that most closely represented their answer to the question. The survey was scored using a Likert scale, with 4 points assigned to the happy face, 2 points to the neutral face, and 1 point to the sad face. Scores ranged from 8 to 32 and were obtained by adding item responses.

**Treatment fidelity.** Research assistants (RAs) assessed the PI’s treatment fidelity of the VSM interventions by answering “yes/no” questions on a treatment fidelity checklist, which included nine items (Appendix B), to determine the percentage of steps that were implemented as planned. Data on treatment fidelity were collected for 33% of the intervention sessions. The PI had 100% treatment fidelity across participants for all intervention sessions for which data were collected, indicating that the VSM intervention was implemented correctly in all sessions.

**Social validity.** Classroom teachers whose students participated in the study completed an adapted version of the Intervention Rating Profile-15 (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985; see Appendix C) following the intervention phase. The adapted IRP included 14 items designed to measure acceptability of the intervention, which were rated on a Likert-type rating scale ranging from 1 (strongly disagree) to 6 (strongly agree). The items on the scale assessed the extent to which the teachers found the VSM intervention acceptable, effective, efficient, and fair. The IRP-15 is reported to have an internal consistency of .98 indicating a high degree of reliability (Carter, 2007; Martens et al., 1985).
Students who participated in the study completed a brief questionnaire at the end of the intervention (see Appendix D). The questionnaire consisted of five items designed to measure student acceptability of the intervention using a Likert-type rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items on the scale assessed whether the students found the VSM intervention acceptable, helpful, and efficient.

**Interobserver Agreement (IOA)**

Interobserver agreement (IOA) was calculated for 30% of the sessions, evenly distributed across experimental phases, measures, and students. Using a running record recording form, the PI and RA independently scored the video-recorded direct observation sessions. IOA was determined by calculating percentage of agreements on a point-by-point (word-by-word) basis (Kazdin, 1982) for both WCPM and EPM. RAs included two students who were enrolled in a graduate and undergraduate program studying Applied Behavior Analysis. The RAs participated in a training session where they listened to an audio recording of a student reading from a running record. They were then trained on recording miscues on a running record observer sheet. After marking the errors on the sheet, the PI trained the RAs on calculating WCPM and EPM. A score of 90% or above was required during the training sessions before serving as an RA, The PI trained the RAs by implementing behavioral skills training (BST) involving instructions (telling them how to record the data), modeling (showing them how to record the data), role-play (allowing the RAs time to practice recording miscues on the running record analysis sheet), and feedback (providing the RAs with specific verbal praise for the steps completed accurately and corrective feedback for errors in recording). The mean IOA across phases and measures were 98.2% (range 97.1-100%) for Micha, 98.8% (range 99.2-98.5%) for Nikki, 99.5% (range 98.3-100%) for Bruce, and 99.3% (range 98.6-100%) for Kenneth.
Data Analysis

Direct observation data on individual oral reading fluency were analyzed visually in each phase for changes in trend, level, immediacy effect, and overlap. Individual data on the CRI and RAS were analyzed using descriptive statistics (range and mean) to examine differences before and after the intervention. Social validity surveys were also analyzed using descriptive statistics.

Materials

A Canon HD camera was used to create the VSM videos. The videos from the camera were then saved to a 16 GB memory card and downloaded to a laptop computer with Windows 8. The video footage was edited using Windows Movie Maker, and saved in a secured, password protected folder. The intervention passages used to create the videos were drawn from the students’ grade level textbook Journeys.

Experimental Design and Procedures

The outcomes of the VSM intervention were assessed using a non-concurrent multiple baseline design across participants. After baselines were established for each participant, the VSM intervention was introduced in a staggered fashion. For the participant whose reading fluency did not meet goal line levels following VSM over three consecutive sessions, repeated reading was added to the intervention. Generalization and follow-up probes were conducted by requiring the participants to read novel passages.

Development of videos. After collecting baseline data, the PI developed VSM videos to be used in the intervention, following the six-step process suggested by Bellini and Elhers (2009): (1) choosing target behaviors; (2) identifying who will be in the video; (3) planning the production of the video; (4) filming the behavior; (5) editing the footage; and (6) showing the video to the target students.
During this time, the PI worked with the classroom teachers to identify passages from the *Journeys* textbook, a K-6 reading program with Common Core standards instructional design. The passages were used to create the VSM intervention videos and assess the student’s oral reading fluency in baseline and intervention. These intervention passages were used to assess the impact of VSM on reading fluency. Videos of students and the PI engaging in an echo reading activity with each of the preselected passages were recorded using a camera.

These videos depicted the students sitting at a table and looking down at the passage in front of them while repeating what the PI read. This process continued until the students and the PI had been recorded reading all passages using echo reading. Once the videos were created, they were edited to remove all reading prompts from the PI and depicted the students looking at the passage and reading independently. The final videos included the words from the passage written across the screen. To ensure that the students paid attention to the entire video, all edited videos were 1 to 2.5 min (Buggey, 2007). The number of videos edited for each student varied. Ten videos were edited for Micha; five videos were edited for Nikki 12 videos were edited for Bruce; and 10 videos were edited for Kenneth. The differences in the number of videos created for the students were due to the different baseline sessions and intervention sessions needed by the students.

**Baseline.** In each baseline session, individual students were asked to read one passage aloud for 2 min. Each passage was randomly selected from the passages that were used to create the VSM intervention videos. These reading sessions were video recorded for later scoring. Baseline data were collected 3-5 times per week during regular school hours in the intervention room located in the guidance suite. Data on WCPM and EPM were collected by viewing the recorded sessions. To collect these data, the research team used a running record analysis form to
mark reading errors and calculate WCPM. Baseline data were used to develop the intervention goals for WCPM and EPM.

**VSM.** In this phase the participants were brought into the intervention room by the PI, given a set of headphones and asked to watch a previously edited video on a laptop computer. During sessions, the PI did not talk to the students until they were finished viewing the entire video. After viewing the video, the students were given a running record of the same passage that was viewed on the video and asked to read the passage aloud for 2 min (this was determined by setting a 2-min timer). In each session, one video was randomly selected from the 10 videos with intervention passages that had not been viewed in the previous sessions. VSM sessions lasted approximately 10 min.

To end the VSM intervention, students needed to meet or exceed the criterion for mastery, which was an increase in WCPM by 1.5-2 words per min (Texas Center for Reading and Language Arts; TCRLA; 2002) from median baseline levels over three consecutive sessions or an increase in reading fluency from the 20th percentile to 50th percentile as measured by Easy CBM. Students met the criterion for mastery if the data points were at the goal line, they exceeded mastery if the data points were above the goal line, and they did not meet mastery if the data points were below the goal line.

**VSM + repeated reading (VSM + RR).** For one participant, Micha, whose oral reading fluency did not improve following VSM alone, repeated reading was introduced. Micha engaged in repeated reading by reading the passage a total of two times each. Data on WCPM and EPM were collected while the student read from the running records. To collect these data, a running record analysis form was used to mark reading errors and calculate WCPM for the passages read during the repeated reading. These data were collected each time the passages were read, and
WCPM and EPM were measured by averaging the two. To end the VSM + RR intervention, the student needed to meet or exceed the criterion for mastery, which was an increase in WCPM by 1.5-2 words per min from baseline levels over three consecutive sessions or an increase in reading fluency from the 20th percentile to 50th percentile as measured by Easy CBM.

**Generalization and follow-up.** Generalization probes were conducted at the end of the sessions in baseline and throughout intervention for all study participants. During these probes, students were asked to read novel grade level passages provided by their teacher that were from a supplemental text for the *Journeys* textbook, but did not include the same passages as *Journeys*; these passages were not from the same textbook as the baseline and intervention passages and did not have an accompanying VSM video. Students read these passages aloud for 2 min.

To determine whether generalized reading skills were maintained at follow-up, three follow-up reading probes were conducted for three of the four participants one to two weeks following the intervention. Generalization and follow-up probes lasted no more than 10 min for all students. Data on WCPM and EPM were collected by viewing the recorded sessions. Follow-up data for Bruce and Kenneth were collected two weeks following the end of the intervention. Due to time constraints, follow-up data for Micha were collected one week following the end of the VSM intervention.
Chapter 3:

Results

Oral Reading Fluency

WCPM and EPM. Figure 1 depicts data on WCPM and EPM across experimental phases for all four participants. As shown in the figure, three of the four participants demonstrated improved oral reading rates, exceeding their predetermined goals as a result of the VSM intervention. Levels of WCPM during intervention were higher than those during baseline. The mean WCPM increased an average of 9.5 WCPM for Micha; 15.8 WCPM for Nikki; 17.5 WCPM for Bruce; and 31.55 WCPM for Kenneth between baseline and intervention phases with an immediate change in WCPM when VSM was implemented. Because improvement of WCPM during VSM was minimal for one of the participants (Micha), VSM + RR was implemented. After implementing VSM + RR, this participant met the mastery criterion for WCPM. On the other hand, data on EPM did not clearly demonstrate the impact of VSM on errors made across participants. Only two participants (Nikki and Kenneth) showed a reduction in errors as WCPM increased during VSM intervention. The average reduction in errors during VSM for these participants were 9.6 EPM for Nikki and .5 for Kenneth. For the participant who received RR in addition to VSM, her error rates increased even though WCPM increased. Therefore, the data do not clearly demonstrate whether adding RR to VSM had a positive impact on her reading fluency because of her increased error rates. Table 1 summarizes each participant’s reading performance across phases.
Micha. The first panel of Figure 1 depicts data for Micha. During baseline, Micha read an average of 41.5 WCPM and made an average of 6 EPM. During the VSM intervention, Micha read an average of 51 WCPM and made 3.9 EPM. The levels of WCPM increased whereas the levels of errors decreased to some degree. However, WCPM data were highly variable with 65% of the intervention data points overlapping the highest baseline data point. Furthermore, Micha did not meet the criterion for the VSM intervention, which was to meet or exceed 50.5 WCPM, 52 WCPM, and 53.5 WCPM over three consecutive sessions. When VSM + RR was implemented, Micha’s WCPM increased to 64.4 WCPM. WCPM rates during the VSM + RR phase exceeded the criterion for mastery, demonstrating an increasing trend. However, Micha’s EPM did not decrease with the addition of RR, rather it increased to 8.4 EPM.

Nikki. The second panel of Figure 1 displays data for Nikki. During baseline, Nikki read an average of 62.1 WCPM and made an average of 15.4 EPM. During the VSM intervention, Nikki read an average of 77.9 WCPM and made an average of 5.8 EPM. Using the median of the WCPM read by Nikki in baseline, it was determined that Nikki needed to read or exceed 62.5 WCPM, 64 WCPM, and 65.5 WCPM over three consecutive sessions during the VSM intervention. During the VSM intervention, Nikki’s intervention data depict an immediate, slight increase in the level of WCPM and a decrease in EPM following the introduction of the VSM intervention. The data also show an increasing trend in WCPM and a decreasing trend in EPM throughout the intervention phase.

Bruce. The third panel of Figure 1 displays data for Bruce. During baseline, Bruce read an average of 77.7 WCPM and made 2.8 EPM. During the VSM intervention, Bruce read 95.54 WCPM and made 3 EPM on average. Using the median of the WCPM read by Bruce in baseline, it was determined that Bruce needed to read or exceed 82.5 WCPM, 84 WCPM, and 85.5
WCPM over three consecutive sessions during the VSM intervention. Bruce’s intervention data depict an immediate and substantial increase in the level of WCPM and his EPM remained stable at low levels. Although there is a decrease in WCPM following session 12, the data were stable.

**Kenneth.** The fourth panel in Figure 1 display data for Kenneth. During baseline, Kenneth read an average of 73.9 WCPM and made 3.4 EPM. During the VSM intervention, Kenneth read an average of 105.45 WCPM and made 2.9 EPM. Using the median of the WCPM read by Kenneth in baseline, it was determined that Kenneth needed to read or exceed 77.8 WCPM, 79.3 WCPM, and 80.8 WCPM over three consecutive sessions during the VSM intervention. Kenneth’s intervention data demonstrate an immediate increase in the level of WCPM following the introduction of the VSM intervention. Although there is a slight decrease in WCPM following session 14, Kenneth’s data show an increasing trend and remain well above baseline and initial intervention sessions. Data on EPM remained stable during the intervention not exceeding those of baseline.

**Generalization and Follow-up**

The second research question was to determine whether oral reading fluency would generalize to novel passages, and whether the generalized treatment effects would be maintained one or two weeks after treatment had been discontinued. As shown in Figure 1, three of the four participants demonstrated some generalization effects on both WCPM and EPM with novel passages in the VSM condition. All four participants demonstrated increases in WCPM, but one participant’s (Micha) error rates also increased during weekly generalization probes with novel passages. In terms of relative change, the VSM + RR condition resulted in similar generalization effects to the VSM only condition on WCPM with novel passages for the participant (Micha) who received additional RR intervention. During follow-up observations, three of the four
participants showed some maintenance of generalized improvement in WCPM. For Micha, one of her three data points was higher than those of baseline and as the passages used during generalized became harder her reading also improved. For Bruce, two of his three follow-up probes had higher levels than his baseline probes. All three follow-up probes for Kenneth were above baseline levels with an increasing trend. Additionally, EPM remained low and stable for two of the participants (Kenneth and Bruce). Although an increase in EPM was observed for one participant (Micha) in the last follow-up session, the average number of errors in follow up were lower than those observed during the VSM+RR phase.

**Comprehensive Reading Inventory (CRI)**

Table 2 depicts data from the CRI. The CRI was administered to participants prior to baseline to assess oral reading fluency (pre-test) and immediately following the intervention to assess gains (post-test). The results from the CRI indicated that for all participants’ oral reading fluency improved by one grade level as a result of intervention. Prior to intervention, Micha was reading at a CRI level 4. After the intervention her score improved to a CRI level of 5. Nikki was reading at CRI level 3 before intervention and CRI level 4 after intervention. Bruce was reading at CRI level 4 before intervention and CRI level 5 after intervention. Kenneth was reading at CRI level 5 before intervention and a CRI level 6 after the intervention.

**Reading Attitude Survey (RAS)**

The third research question was to determine whether the VSM intervention would positively impact the way the participating students viewed themselves as readers. The RAS was administered prior to baseline and following the end of the intervention. When asked questions regarding their attitudes towards reading following the intervention, two of the four participants (Nikki and Kenneth) answered the questions with more negative responses indicating a
decreased attitude toward reading. Nikki’s response to 4 items changed from a positive to negative response. These items asked the questions “How do you feel about your reading classes at school; how do you feel about the stories you read during class; how do you feel when you read out loud during class; and how do you feel about reading? When responding to the RAS post-intervention, Kenneth’s response to 2 items changed from a positive to negative response. These items asked the questions “How do you feel when you have free time at school to read anything you want” and “How do you feel when you read out loud in class? Table 3 summarizes the participants’ responses from pre and post RAS.

Social Validity

Social validity was measured using the IRP-15 (Table 4) and a social validity questionnaire (Table 5) to identify the extent to which the students participating in the study and their teachers found the intervention acceptable. Individual teacher responses on IRP indicated both high and moderately high levels of social validity. The average of the individual teacher responses was 4.5 for teacher one regarding Micha’s treatment, 4.35 for teacher one regarding Nikki’s treatment, 3.42 for teacher two regarding Bruce’s treatment, and 3.57 from teacher three regarding Kenneth’s treatment.

Individual student responses on the social validity survey indicated that all student participants rated VSM as having high levels of social validity. The average of the individual student responses was 4.2 for Micha, 4.4 for Nikki, 4.6 for Bruce, and 4 for Kenneth. All but two of the items received a rating of three or above. When asked “I am a more confident reader than I was before the intervention”, Kenneth responded with a 2 which indicates “disagree”. When asked “I would tell people who have a hard time reading to try this intervention”, Micha
responded with a 1 which indicates “strongly disagree”. Individual teacher and student social validity data are displayed in tables 4 and 5.
Table 1: Participant Data across Experimental Phases

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>VSM</th>
<th>VSM + RR</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>WCPM Mean (Range)</td>
<td>EPM Mean (Range)</td>
<td>WCPM Mean (Range)</td>
<td>EPM Mean (Range)</td>
</tr>
<tr>
<td>Micha</td>
<td>41.5 (24-51.5)</td>
<td>6.1 (2.5-7)</td>
<td>51.2 (40.5-61.5)</td>
<td>3.9 (2.5-5.5)</td>
</tr>
<tr>
<td>Nikki</td>
<td>62.1 (53-68.5)</td>
<td>15.4 (8-24)</td>
<td>77.9 (70.5-88.5)</td>
<td>5.8 (2.5-9.5)</td>
</tr>
<tr>
<td>Bruce</td>
<td>78 (68.5-86.5)</td>
<td>2.8 (1.5-5)</td>
<td>95.5 (83-107.5)</td>
<td>3 (1.5-6)</td>
</tr>
<tr>
<td>Kenneth</td>
<td>73.9 (61.5-83)</td>
<td>3.4 (2-5)</td>
<td>105.45 (91-119.5)</td>
<td>2.9 (1.5-2)</td>
</tr>
</tbody>
</table>

Note: Mean word read correctly per minute (WCPM) and error per minute (EPM) for participants in experimental conditions.
Table 2: Comprehensive Reading Inventory

<table>
<thead>
<tr>
<th></th>
<th>Micha</th>
<th>Nikki</th>
<th>Bruce</th>
<th>Kenneth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Test Score</td>
<td>Post-Test Score</td>
<td>Pre-Test Score</td>
<td>Post-Test Score</td>
</tr>
<tr>
<td>Level 4</td>
<td>Level 4</td>
<td>Level 5</td>
<td>Level 3</td>
<td>Level 4</td>
</tr>
<tr>
<td>WCPM/EPM</td>
<td>84/4</td>
<td>WCPM/EPM</td>
<td>WCPM/EPM</td>
<td>WCPM/EPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WCPM/EPM</td>
<td>WCPM/EPM</td>
<td>WCPM/EPM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68/2</td>
<td>78/2</td>
<td>104/0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|         | Note. WCPM=Words correct per minute; EPM=Errors per minute.
Table 3: Reading Attitude Survey

<table>
<thead>
<tr>
<th>Question</th>
<th>Micha Pre</th>
<th>Micha Post</th>
<th>Nikki Pre</th>
<th>Nikki Post</th>
<th>Bruce Pre</th>
<th>Bruce Post</th>
<th>Kenneth Pre</th>
<th>Kenneth Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you feel when you find a good book to read?</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>How do you feel when you have free time at school to read anything you want?</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>How do you feel about your reading classes at school?</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>How do you feel about the stories you read during class?</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>How do you feel when you read out loud in class?</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>How do you feel when you read silently in class?</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>How do you feel about reading in front of your classmates?</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>How do you feel about reading?</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Score</strong></td>
<td><strong>24</strong></td>
<td><strong>23</strong></td>
<td><strong>21</strong></td>
<td><strong>15</strong></td>
<td><strong>25</strong></td>
<td><strong>24</strong></td>
<td><strong>30</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

Note. Pre=Pre intervention; Post=Post intervention. Points were assigned to happy, neutral, and sad faces. Happy face=4 points; Neutral face=2 points; Sad face=1 point.
### Table 4: Teacher Social Validity on VSM

<table>
<thead>
<tr>
<th>IRP-15 Question</th>
<th>Teacher 1 Micha</th>
<th>Teacher 1 Nikki</th>
<th>Teacher 2 Bruce</th>
<th>Teacher 3 Kenneth</th>
</tr>
</thead>
<tbody>
<tr>
<td>The intervention was acceptable for addressing oral reading fluency.</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>The intervention proved effective in improving the child’s oral reading fluency.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>I would suggest the use of this intervention to other teachers.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>I would be willing to use this intervention in the classroom setting.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The intervention would be an appropriate intervention for a variety of children.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>This intervention would be easy to use in my classroom.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>I like the procedures used in this intervention.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>The intervention is consistent with those I have previously used in classroom settings.</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>This intervention was an appropriate way to handle this child’s difficulties in reading.</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Soon after the intervention, I noticed a positive change in the child’s reading performance.</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>The intervention improved the child’s oral reading fluency and other behaviors.</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>I am considering the use of Video Self-Modeling with other students who have similar reading difficulties in my classroom.</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>The intervention proved effective in changing the child’s oral reading fluency.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Overall, this intervention was beneficial to the student.</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total score</th>
<th>63</th>
<th>61</th>
<th>48</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average score</td>
<td>4.5</td>
<td>4.35</td>
<td>3.42</td>
<td>3.57</td>
</tr>
</tbody>
</table>

Note. Ratings were based on a 1-5 scale with 1 indicating “strongly disagree” and 5 indicating “strongly agree”.
Table 5: Student Social Validity on VSM

<table>
<thead>
<tr>
<th>Social Validity Questionnaire</th>
<th>Micha</th>
<th>Nikki</th>
<th>Bruce</th>
<th>Kenneth</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked being a part of this intervention.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>I enjoyed watching the videos of myself.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>The intervention helped me to read better.</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>I am a more confident reader than I was before the intervention.</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>I would tell people who have a hard time reading to try this intervention.</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total score</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td><strong>Average score</strong></td>
<td>4.2</td>
<td>4.4</td>
<td>4.6</td>
<td>4</td>
</tr>
</tbody>
</table>

Note. Ratings were based on a 1-5 scale with 1 indicating “strongly disagree” and 5 indicating “strongly agree”.
Figure 1: Oral Reading Fluency across Participants

Figure 1 depicts data on WCPM and EPM across experimental phases for all study participants. Solid squares=WCPM; solid circles=EPM; open squares=WCPM generalization probe; open circles=EPM generalization probes. WCPM=Words Correct per Minute. EPM=Errors per Minute
Chapter 4:

Discussion

The primary aim of the study was to examine the impact of VSM on oral reading fluency of general education students at-risk for reading failure in fourth and fifth grade. The study also examined whether gains attained from the VSM intervention would generalize to novel passages, and the generalized treatment effects would be maintained at follow-up. Additionally, the study examined whether the VSM intervention would have a positive impact on how the study participants viewed themselves as readers. The results indicated that VSM was successful in improving the reading fluency of three of the four participants as evidenced by both data on direct observation measures of WCPM and CRI, and only one participant required the VSM+ RR intervention to reach the criterion for success.

These results were consistent with Montgomerie et al. (2014) who evaluated the effect of VSM on oral reading fluency for children with reading difficulties. These authors found that VSM was successful at improving the oral reading fluency for three out of four participants suggesting that VSM was an effective intervention for some general education elementary students who were identified by their teachers as being behind their peers in reading. The results of the study also support previous findings in that feedforwad VSM can improve oral reading fluency of primary elementary students who are at-risk for reading failure (Robson, Blampied, & Walker, 2015).
Although only a few probe data were collected, the results of the current study also indicate that all participants showed some evidence of generalization of reading fluency to novel passages, indicating that VSM can promote generalization of improved oral reading fluency to untrained passages. The generalization effects found in the study support previous studies on VSM in academic settings that found improvements made during the intervention generalized to novel settings/passages (Hitchcock et al., 2004; Dowrick et al., 2006). For example, Dowrick et al. (2006) and Hitchcock et al. (2004) used VSM and tutoring to improve the oral reading fluency of students in first grade. The researchers found that the VSM intervention was more successful than tutoring alone and these increases in reading fluency generalized to the general education classroom.

As stated earlier, this study is the first to examine the maintenance of generalized treatment effects of VSM as a stand-alone intervention. As evidenced by the graphs depicted in Figure 1, the results indicate that although the participants WCPM remained at or above baseline levels during follow-up, they did not maintain intervention levels. Although these results are unlike those found by Hitchcock et al. (2004) who demonstrated that the increases in reading fluency were maintained at both the one and six-month follow-up probes it is important to note that findings are not representative of all results published in this area. For instance, Montgomerie et al. (2014) found that their study participants did not maintain the increases in oral reading fluency following the withdrawal of intervention. Further, Robson et al. (2015) also found that of their 11 study participants, two of the participants’ reading rates fell below baseline levels and reading rates for three other participants remained above baseline, but were not near intervention levels. These findings may suggest that although VSM can improve reading rates in the
short term, the effects may not be maintained over a long period of time (Montgomerie et al., 2014; Robson et al., 2015). It is possible that a modification to the VSM intervention that includes booster sessions if reading rates drop during follow-up may aid in maintenance.

The results of the current study also suggest that VSM may have limited treatment effects on error rates. Although all participants increased WCPM during VSM to some degree, only two participants demonstrated decreases in error rates; reading errors did not decrease when WCPM increased for the two participants. The increases in EPM could be attributed to the increased reading speed of these participants being that the error types they made during baseline changed from being largely PI assisted, mispronunciation, and substitution error types to omission, substitution, and insertion error types during intervention.

The results of the study also indicate that VSM did not positively impact the participants’ attitudes toward reading. All participants indicated that their attitudes towards reading were more negative than they were prior to the intervention. The decreases in attitude towards reading are similar to the study by Robson et al. (2015) who found that four of their 11 study participants’ reader self-perception did not change or decreased following intervention. However, because all participants in this study rated the intervention as highly acceptable and answered that it helped to improve their reading fluency, it is assumed that participants rated their attitudes towards reading negatively following intervention because the VSM intervention allowed them to become aware of the mistakes they were making whereas this was not the case prior to intervention.
An interesting finding from the RAS was that all students answered the question “How do you feel when you read out loud during class?” with a lower rated response post intervention, but their answers to the question “How do you feel about reading in front of your classmates?” remained the same post-intervention. The participants stated that they didn’t feel embarrassed reading in front of their classmates because this normally happened as paired reading whereas reading in front of the class was a whole group activity. This may indicate that viewing videos of themselves reading made the participants more cognizant of the types of behaviors they engaged in during reading (pacing, rocking back and forth, and moving around).

**Limitations and Future Directions**

Although the effects of the VSM intervention resulted in improvements in reading fluency for three out of four participants, there were several limitations to the study. The first limitation of this study is the limited demonstration of experimental control. One of the participants (Nikki) was moving to a different school, and it was determined that intervention be introduced to him immediately even though her data were not stable. In addition, more baseline data should have been collected for Bruce because his baseline data for WCPM were on an increasing trend when the intervention was implemented although his data for EPM in baseline were on a decreasing trend. Furthermore, Bruce’s WCPM decreased toward the end of intervention. One of the reasons his reading performance decreased may be in part due to having difficulty at home and an increase in problem behaviors in his classroom. Bruce was engaging in major problem behaviors in the classroom, cafeteria, and other areas throughout the school toward of the end of intervention. When he was pulled for sessions he would state that he did not feel like
working that day, cry, or tell the PI that he had recently gotten into a verbal argument with his teacher and peers. His negative emotions might have influenced his reading performance during intervention sessions.

The second limitation of this study is associated with limited generalization and maintenance as evidenced by the data. Being that the study was conducted close to the end of the school year, follow-up data were collected two weeks after the end of the VSM intervention for Bruce and Kenneth and one week after the end of the intervention for Micha. There were no follow-up data collected for Nikki because she withdrew from the school shortly after completing the VSM intervention. Future studies could focus on assessing maintenance data at longer intervals of time.

The third limitation of the study is in the area of generality. The generality of the findings obtained in this study is unknown as the intervention was conducted in a contrived setting by a trained researcher instead of in the classroom environment with the teacher. Other studies could evaluate the implementation of VSM by natural school supports in classroom settings and effective training strategies to enhance the treatment fidelity of VSM when implemented solely by school personnel.

Another limitation of this study is the amount of time it took to create the videos to be used during the interventions. Each video took 30-45 min to create for each student and the students watched a new video each session making the planning and creation of the intervention videos more time-consuming than traditional reading interventions. Although researchers have stated VSM can be less costly and time consuming, this was not the case for this intervention. Finally, due to district-wide testing, field trips, end of
the year events, school-wide activities, and student absences, the PI faced difficulties with establishing a consistent schedule to collect data.

Further research should also focus on the use of VSM to improve oral reading fluency by using a larger sample of students who are at-risk for reading failure, which would enhance the generality of the results. Additionally, although the results of this study demonstrated that follow-up probes did not fall below baseline levels, there are not enough data to suggest this effect would be sustained over time, and thus VSM research can be improved by collecting maintenance data at longer time intervals. Furthermore, booster sessions can be included in the follow up sessions if reading rates drop below the established goal lines. And finally, as the ultimate goal in reading is comprehension, future studies should include a way to measure whether students reading comprehension improves as their oral reading fluency rates increase. Despite its limitations, this study offers a contribution to the body of research on VSM. It provides an empirical support for the use of VSM as an effective intervention for improving the oral reading fluency of students at-risk for reading failure. Future replications should be done in order to solidify these results.
References


Appendices
Appendix A: Reading Attitude Survey-Elementary Grades (K-5)

Student’s Name ________________________________  Age ____________
Date __________________________  Score ____________

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

1. How do you feel when you find a good book to read?

[Smiley face]  Like it a lot
[Neutral face]  Like it a little
[Sad face]  Don’t like it

2. How do you feel when you have free time at school to read anything you want?

[Smiley face]  Like it a lot
[Neutral face]  Like it a little
[Sad face]  Don’t like it

3. How do you feel about your reading classes at school?

[Smiley face]  Like it a lot
[Neutral face]  Like it a little
[Sad face]  Don’t like it

4. How do you feel about the stories you read during reading class?

[Smiley face]  Like it a lot
[Neutral face]  Like it a little
[Sad face]  Don’t like it

5. How do you feel when you read out loud in class?

[Smiley face]  Like it a lot
[Neutral face]  Like it a little
[Sad face]  Don’t like it
6. How do you feel when you read silently in class?

Like it a lot  Like it a little  Don’t like it

7. How do you feel about reading in front of your classmates?

Like it a lot  Like it a little  Don’t like it

8. How do you feel about reading?

Like it a lot  Like it a little  Don’t like it
Appendix B: VSM Fidelity Checklist

Student: _________________________________
Intervention Agent: ________________________
Date of Observation: _______________________

<table>
<thead>
<tr>
<th>Video Self-Modeling Intervention</th>
<th>Did the implementer complete the step?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students were given headphones prior to viewing the video.</td>
<td>Yes  No</td>
</tr>
<tr>
<td>2. All videos viewed by the student were 1-2.5 minutes in length</td>
<td>Yes  No</td>
</tr>
<tr>
<td>3. The PI did not talk to the student while the video was being watched</td>
<td>Yes  No</td>
</tr>
<tr>
<td>4. The VSM intervention was implemented prior to the administration of the running record</td>
<td>Yes  No</td>
</tr>
<tr>
<td>5. The student was given the same passage to read that was viewed in the VSM video</td>
<td>Yes  No</td>
</tr>
<tr>
<td>6. The passage was read for a maximum of 2-min</td>
<td>Yes  No</td>
</tr>
<tr>
<td>7. The WCPM and reading errors per minute read by the student was calculated for the passage</td>
<td>Yes  No</td>
</tr>
</tbody>
</table>

**TOTAL** (# Yes / # Total)

**Percent Score**
Appendix C: Social Validity Questionnaire (Teacher Form)

Teacher: ____________________ Date: __________

This questionnaire consists of 14 items. For each item, you need to indicate the extent to which you agree or disagree with each statement. Please indicate your response to each item by circling one of the six responses to the right.

1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The intervention was acceptable for addressing oral reading fluency.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. The intervention proved effective in improving the child’s oral reading fluency.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. I would suggest the use of this intervention to other teachers.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. I would be willing to use this intervention in the classroom setting.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. The intervention would be an appropriate intervention for a variety of children.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6. This intervention would be easy to use in my classroom.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7. I like the procedures used in this intervention.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8. The intervention is consistent with those I have previously used in classroom settings.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9. This intervention was an appropriate way to handle this child’s difficulties in reading.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>10.</td>
<td>Soon after the intervention, I noticed a positive change in the child’s reading performance.</td>
</tr>
<tr>
<td>11.</td>
<td>The intervention improved the child’s oral reading fluency and other reading behaviors.</td>
</tr>
<tr>
<td>12.</td>
<td>I am considering the use of Video-Self Modeling with other students who have similar reading difficulties in my classroom.</td>
</tr>
<tr>
<td>13.</td>
<td>The intervention proved effective in changing the child’s oral reading fluency.</td>
</tr>
<tr>
<td>14.</td>
<td>Overall, the intervention was beneficial to the student.</td>
</tr>
</tbody>
</table>
Appendix D: Social Validity Questionnaire (Student Form)

Student: ____________________                                                   Date: ___________

This questionnaire has 5 statements. For each statement, circle the answer that is closest to your answer.
1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree

<table>
<thead>
<tr>
<th>Questions</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I liked being a part of the intervention.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2. I enjoyed watching the videos of myself.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3. The intervention helped me to read better.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4. I am a more confident reader than I was before the intervention.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5. I would tell people who have a hard time reading to try this intervention.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
Appendix E: USF IRB Approval Letter

November 26, 2014

Monica Anestin
ABA-Applied Behavior Analysis
4200 E Fletcher Ave Apt A209
Tampa, FL 33613

RE: Expedited Approval for Initial Review
IRB#: Pro00019694
Title: Reading in the Digital Era: Using Video Self-Modeling to Improve Reading Fluency in At-Risk Students

Study Approval Period: 11/26/2014 to 11/26/2015

Dear Ms. Anestin:

On 11/26/2014, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents outlined below.

Approved Item(s):
Protocol Document(s):
VSM Study Protocol

This study involving data pertaining to children falls under 45 CFR 46.404 – Research not involving greater than minimal risk.

Consent/Assent Document(s)*:
Parent Informed Consent.pdf
Teacher Informed Consent.pdf
Student Verbal Assent (not stamped)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).
It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

[Signature]

John Schinka, Ph.D., Chairperson
USF Institutional Review Board