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An Examination of the Effects of Using Systematic and Engaging Early Literacy Instruction to Teach Tier 3 Students to Read Consonant-Vowel-Consonant (CVC) words

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A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

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ABSTRACT

An Examination of the Effects of Using Systematic and Engaging Early Literacy Instruction to Teach Tier 3 Students to Read Consonant-Vowel-Consonant (CVC) words

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Master of Arts

A single-subject-multiple-baseline-across-behaviors design was used to examine the effects of using Systematic and Engaging Early Literacy (SEEL) instruction to help Tier 3 kindergarten students learn to read CVC words. Four students designated as Tier 3 by their teachers participated in the study. They were grouped into two dyads and received SEEL instruction focusing on specific word reading targets for approximately 20 minutes four days per week over a seven-week time period. The instruction included meaningful, interactive activities and incorporated high levels of play, multiple exposures to the target, explicit instruction, and student-teacher conversational exchanges. Baseline assessment data were collected prior to the application of the intervention for each of the targets and assessment data continued to be collected after each intervention session. All students learned to read the target words and three of the students generalized their learning to other targets. A moderate to large effect size of 0.54 was obtained using Cohen's *r* value. The need for adequate exposure to targets and time to practice was highlighted, along with the value of revisiting targets and addressing individual student's needs when working in small groups.

Keywords: reading, decoding, kindergarten, CVC words, response to intervention, Tier 3, single subject design

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Chapter 1: Introduction

In the information-based society in which we live, the ability to read is an important skill for success. Indeed, the inability to read has been reported as having a number of potentially negative and detrimental consequences for the individual and for society at large (Nes Ferrara, 2005; Fielding, Kerr, & Rosier, 1998). For most children learning to read is a relatively simple procedure. Having received reading experiences with proficient adults, training in early literacy skills, and plenty of time and opportunity to practice, the majority of children learn to read fairly easily and over time become fluent and skillful readers of the written word. For a small minority, however, learning to read is extremely difficult. Providing all students, including those who struggle, with the best reading instruction is an important and worthy goal. Furthermore, with the arrival of the No Child Left Behind Act (U.S. Department of Education, 2001), teaching all students to be able to read to at least grade level is a requirement of all teachers.

In response to mandates such as this act, which have been imposed on teachers in recent years, and in the continual quest to improve the education of young children, a framework known as Response to Intervention (RTI) was introduced as a means to help teachers monitor student progress and provide immediate assistance to those students not reaching the expected standards (International Reading Association, 2010). A great deal of research has been devoted to the development and implementation of RTI, and much success with various programs has been observed (e.g., O'Conner, Harty, & Fulmer, 2005).

As RTI is a framework that can be adapted as needed it can vary somewhat. However, a three-tier system is often implemented. Tier 1 involves the whole class in research-based, high quality teaching. Tier 2 usually includes approximately the lowest

20% of students who need a little extra support. These students will receive small group instruction targeting their area of need. Tier 3 includes those students from Tier 2 who failed to make adequate progress and require further support. These students are often taught individually so that their specific learning needs can be met (Burns, Vanderwood, & Ruby, 2005).

Statement of Problem

In the quest to help those students struggling to learn to read, a great deal of time and research has been devoted to developing and implementing reading intervention programs. Despite the success found with many of these programs, nothing has been found as a "cure all" intervention for reading difficulties. As the specific experiences and challenges of students with reading difficulties are so diverse and complex, the discovery of one intervention to resolve all problems is very unlikely. Thus it is important to provide teachers with a wide range of resources and tools from which to draw upon to enable them to reach all students and cultivate opportunities for every learner's success. The continual exploration of possible resources and tools for teachers to use is therefore important.

One such resource is Systematic and Engaging Early Literacy known as SEEL (Culatta, Aslett, Fife, & Setzer, 2004). SEEL is an approach for teaching early literacy skills to young children in a meaningful, interactive context. The goal of SEEL is to help young children learn to read and write through the development of skills in the areas of phonological and phonemic awareness, alphabetic knowledge, and phonics, while providing opportunities for authentic reading and writing experiences. This is accomplished as students are involved in meaningful, playful, child-centered activities led by an adult who teaches in an engaging way that appeals to young children.

Various research studies on the SEEL project have been conducted and include the examination of using SEEL in a dual language kindergarten classroom (Culatta et al., 2004); the use of custom-made digital media in teaching SEEL to Spanish speakers (Culatta, Culatta, Frost, & Buzzell, 2004); the effectiveness of SEEL instruction in rhyme and letter knowledge with both Spanish and English-speaking children in Headstart pre-schools (Culatta, Hall, Kovarsky, & Theadore, 2007); and the examination of the use of SEEL by paraeducators with small groups of low ability students (Bingham, Hall-Kenyon, & Culatta, 2010). Favorable results have been obtained, suggesting that SEEL is an effective approach for teaching early literacy skills. However, the use of this program has not yet been explored specifically with Tier 3 kindergarten students in the context of the RTI model.

Purpose

The purpose of this study is to examine the effect of SEEL instruction on four kindergarten students displaying signs of difficulties in learning to read. Specifically, their ability to learn to read consonant-vowel-consonant (CVC) words will be studied. After six months in school, and having received SEEL instruction in both whole class and small group contexts, these students continue to have difficulty with reading CVC words. The purpose of this study is to find out if using SEEL intensively in a tutoring situation will enable these students to begin decoding CVC words with greater success.

Research Question

What are the effects of SEEL instruction on CVC word reading for Tier 3 kindergarten students?

Chapter 2: Review of Literature

The Importance of Reading and Early Reading Intervention

The amount of time, effort, money, and public policy devoted to the improvement of reading instruction highlights the value put upon reading in today's society. In the United States the No Child Left Behind Act, passed by congress and signed into law by George W. Bush in 2001, emphasized the importance of reading with its Reading First program and stated that all children by Grade 3 should be reading at grade level (U.S. Department of Education, 2001). It can be argued that the emphasis in reading acquisition is correctly placed in the information-oriented society in which we live, as the ability to read, or not read, can greatly impact an individual's life.

The mandate to have all students reading at grade level by Grade 3 is a result of various studies, which indicate that remediating reading difficulties becomes increasingly challenging after third grade (e.g., Fletcher & Foorman, 1994). Furthermore, studies have shown that students displaying poor reading skills in the early years of school rarely catch up to their peers. A study carried out by Juel (1988) suggested that a child identified as a poor reader in Grade 1 is likely to still be a poor reader in Grade 4. Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher (1996) stated,

> One of the most compelling findings from recent reading research is that children who have a poor start in reading rarely catch up. As several studies have now documented, the initial poor reader almost invariably continues to be a poor reader. (p. 5)

Similarly, Scarborough (2001) noted that despite remedial efforts, 65%-75% of students identified as poor readers in their early school years continue to be identified as poor

readers throughout their time in school and beyond. Stanovich (1986) referred to the "Matthew effect", which described how the gap between good readers and poor readers usually gets wider with time. He attributed this to the fact that amongst other advantages, good readers are able to read a greater volume than poor readers, which leads to more reading practice and thus has an upward spiral effect of greater improvements in reading. The opposite is true for poor readers, however, as they read fewer words and thus get less reading practice, which results in slower reading improvement.

As poor readers get progressively further behind in their reading ability the implications can be significant. Difficulty with reading can have major academic implications resulting in an inability to fully access the wider curriculum. Reading difficulties have also been found to affect a child's self-esteem and self-efficacy (Nes Ferrara, 2005), which further inhibits learning. Furthermore, a strong correlation between behavior problems and reading difficulties has been identified (Cornwall & Bawden, 1992; Nelson, Benner, Lane & Smith, 2004) and; as reported by Fielding, Kerr, and Rosier (1999); reading difficulties can negatively affect society at large.

Based on the fact that the ability to read is crucial in today's society and that children experiencing early reading difficulties are likely to continue having problems with reading, early reading intervention programs are recognized as being particularly important. Despite reports that poor readers rarely catch up to good readers, various studies have found that most children experiencing early difficulties can go on to become successful readers with the right experience, instruction, and early intervention (Clay, 1985; Iversen & Tunmer, 1993; Pinnell, 1989; Scanlon & Vellutino, 1996; Scanlon &

Vellutino, 1997; Scanlon, Vellutino, Small, Fanuele, & Sweeney, 2005; Vellutino et al., 1996; Wasik & Slavin, 1993).

The need for early intervention has been highlighted by policy makers as illustrated by the changes made to The Individuals with Disabilities Education Act in recent years. This Act was established in 1990 and replaced the Education for the Handicapped Act from previous years. It recognized the importance of early intervention for students displaying early signs of educational difficulties. Since the 2004 reauthorization of this Act, funds have been made available for intervention for students from kindergarten through 12th grade, with a greater portion going to students from kindergarten through third grade (Wright & Wright, 2007). With an emphasis on intervention, these funds are for students who have not been diagnosed as having special educational needs but who have been identified as being at-risk of learning difficulties and in need of focused intervention (Fuchs, Fuchs, & Vaughn, 2008; Graner, Faggella-Luby, & Fritschmann, 2005).

Response to Intervention

A practical way of addressing the needs of these students requiring additional help in the classroom is through the RTI framework, which was developed as a result of recommendations made by the President's Commission on Excellence in Special Education (2002). The International Reading Association (2010) described RTI as a "systemic initiative rather than a specialized or particular program" (p. 1) and offered six guiding principles in implementing RTI in schools. These principles highlight the need for (a) high quality, research-based instruction; (b) increasingly intensive and differentiated instruction and intervention based on the needs of individual students; (c) effective, informative, and timely assessments; (d) productive collaboration amongst classroom

teachers, appropriate experts, parents, and students; (e) a systematic and comprehensive approach based on the needs and resources of schools; and (f) highly-qualified, well-prepared classroom teachers and support staff.

Although RTI is designed to be adapted to the needs of those using it and can thus vary quite significantly, in many cases three tiers of instruction are involved (Burns, Deno, & Jimerson, 2007). The tier system begins with high quality teaching using research-based instructional methods to address students' needs. This level in RTI is known as Tier 1 and involves all students in the classroom. It is estimated that approximately 20% of these students will not make adequate progress at this stage (Burns et al., 2005). These students are identified through careful observation and assessment and move to Tier 2 where they are given an appropriate intervention in a small group setting. Burns et al. (2007) suggested that this intervention should involve high-quality, explicit instruction and should take place for at least 30-60 minutes per day. Those students who continue to make insufficient progress after receiving Tier 2 instruction move to Tier 3 and are given more focused, personalized support. Burns et al. (2007) suggested that Tier 3 intervention should take place in groups of three or less. They further stated,

> Although the exact intervention will likely vary from child to child, it should target the deficit area, explicitly teach the skill, provide frequent opportunities to respond, use materials that provide an appropriate level of challenge, and contain sufficient feedback to inform the child of successes and errors. (p. 435)

Throughout the RTI process students are continually and carefully monitored to ensure they are receiving the support and instruction they need to make the expected progress.

Several research studies have indicated that the RTI approach is effective in identifying and addressing early educational difficulties. For example, O'Conner, et al. (2005) examined the effects of providing three tiers of intervention to students from their second term in kindergarten to the end of third grade. They found that providing literacy intervention that was determined by students' specific needs improved students' early literacy difficulties and identified those students who had special educational needs and thus needed further support.

Several states and districts have been examining and implementing RTI (Berkely, Bender, Peaster, & Saunders, 2009; Hoover, Baca, Wexler-Love, and Saenz, 2008), and a number of states have been using models similar to RTI for several years (Jimerson, Burns, & VanDerHeyden, 2007). For example, as early as 1997 the state of Idaho began implementing a Results Based Model (RBM), which is similar to RTI. RBM involves several key practices including an examination of the education system being used. Particularly important to this is recognizing the role of context in students' education, identifying problems early, and using strategic and intensive interventions. Also important to RBM is establishing problem-solving teams for individual students, involving parents, identifying the most effective interventions, monitoring student progress closely, using data systematically to make decisions regarding instruction, and using the dual-discrepancy approach to identify students needing extra support (Callender, 2007). A study of its effectiveness found that schools using RBM showed a decrease in referral to special education and that students who attended RBM schools and received intervention plans made significantly more progress compared with similar students in non-RBM schools (Nunn, 2005).

Early Reading Skills

Response to Intervention within the subject of reading begins with effective instruction of early reading skills. There are a number of early reading skills a child needs to develop to become a successful reader. As well as having opportunities to develop schema and a rich vocabulary and language base, children also need to develop skills directly associated with the act of reading. Some of these important skills include phonological and phonemic awareness, and alphabetic knowledge and phonics (Adams, 1990; Armbruster, Lehr, & Osborn, 2001; McGee & Richgels, 2008). Scarborough (1998) conducted a meta-analysis of 61 studies in which she found that the best predictor measures for children's future reading difficulties were phonological awareness and alphabetic knowledge. The National Reading Panel (2000) reported that although phonemic awareness and phonics instruction are only part of a complete reading program, research indicated that they both have a positive impact on children's reading development and should be taught in kindergarten.

Phonological and phonemic awareness. Phonological awareness is a term used to describe the ability to hear and manipulate sounds within spoken words, including "identifying and manipulating larger parts of spoken language, such as words, syllables, and onsets and rimes—as well as phonemes" (Armbruster et al., 2001, p. 2). It is recognizing, for example, that some words rhyme, some words begin or end with the same sound, and that words can be broken down into syllables. Phonemic awareness is a part of phonological awareness and is the ability to hear and manipulate individual phonemes or sounds in spoken language (Armbruster et al., 2001; Blachman, 2000).

The role and importance of phonological awareness in reading development has been documented widely in the research. It seems logical that in an alphabetic language such as English, the ability to hear individual sounds that are represented by letters would aid in learning to read (Bryant, MacLean, Bradley, & Crossland, 1990; Stahl & Murray, 1994). Several studies have gathered evidence suggesting that the better children's phonological awareness is, the quicker and greater success they will experience in learning to read (e.g., Bryant & Bradley, 1985; Lonigan, Burgess, & Anthony, 2000; Ritchey & Speece, 2006; Wagner & Torgeson, 1987).

Similarly, research has shown that most children who struggle with early reading difficulties display signs of phonological deficits (e.g., Blachman, 1994; Bradley & Bryant, 1983; Savage, Frederickson, Goodwin, Patni, Smith, & Tuersley, 2005; Vellutino et al., 1996; Wagner & Torgesen, 1987). A study by Juel (1988), for example, showed that most students who tested poorly in phonological awareness skills in first grade were identified as being in the bottom quarter of the class in reading in fourth grade.

For those students affected by personal phonological deficits, research has shown that phonological awareness skills can be improved through instruction (Phillips, Clancy-Menchetti, & Lonigan, 2008). Furthermore, numerous studies have indicated that phonological awareness instruction can result in greater success in early reading and spelling (Blachman, 2000). Lundberg, Frost, and Peterson (1988) studied kindergarten children who received phonological awareness instruction without any phonics instruction and compared them with a control group exposed to both phonological awareness and phonics instruction. At the end of the year those students in the treatment group outperformed the control group significantly on phonological awareness measures, but not

on reading. By the end of first grade those same students outperformed the control group on spelling, and by the end of second grade they outperformed the control group in both reading and spelling. Although reading improvements were not immediate for the experimental group of students, their strong foundation in phonological awareness appeared to manifest itself in greater reading scores two years later, thus suggesting long-term benefits in intense phonological awareness instruction in kindergarten.

Although there seems to be evidence that phonological awareness instruction can be taught successfully without any reference to the written symbol, as cited in Lundberg et al.'s (1988) findings, a number of studies have established a reciprocal relationship between phonological awareness and phonics instruction. Stahl, Duffy-Hester, and Stahl (1998) suggested that good phonics instruction will aid in the development of phonological awareness and, similarly, good phonological awareness instruction will help to develop phonics knowledge and skills. Several studies have indicated that combining phonological awareness instruction with phonics instruction can result in greater gains in reading and spelling (e.g., Ball & Blachman, 1988, 1991; Bradley & Bryant, 1983; National Reading Panel, 2000). Researchers have suggested that both phonological awareness and knowledge of how sounds are represented in print are needed to be able to understand the alphabetic principle (Byrne & Fielding-Barnsley, 1991).

The alphabetic principle and phonics. Once students are able to hear individual sounds in words they are able to learn to associate those sounds with their symbols. They learn that there is a predictable relationship between the phoneme (individual sound) and the grapheme (symbol that represents a sound) and learn that just as phonemes follow each other in spoken words, graphemes follow each other in a left to right direction in

written words. As students come to understand these concepts they are able to begin reading the graphemes they see in print and converting them to spoken sounds to make words. Similarly, they are able to write the sound they hear in words in the form of letters to write words (Armbruster et al., 2001).

There are a number of approaches that are used in the instruction of systematic phonics. Synthetic phonics is the means by which students are taught phoneme-grapheme correspondence and then begin blending and segmenting words. Analytic phonics involves students in identifying words and then identifying sounds within those words. Analogy phonics encourages students to use parts of words they already know to help them read other similar words. Phonics in spelling teaches students to segment the sounds in words and to write them. Phonics in context has students using phonic cues as well as context cues in helping them to read words (Harris & Hodges, 1995). None of these approaches to teaching phonics must be mutually exclusive. A variety of approaches can be used simultaneously.

As early as 1967 Jeanne Chall found, after analyzing several early reading research studies, that systematic, early phonics instruction is more effective than later, non-systematic phonics instruction. Furthermore, she, and others later, found that synthetic phonics (teaching letter-sound association first and then teaching students to blend the sounds and letters together) yields slightly better results than other types of phonics instruction (Adams, 1990; Chall, 1983). Similar to Chall's results, the National Reading Panel (2000) conducted a meta-analysis of 38 research studies and found that systematic phonics instruction is more effective than unsystematic phonics or no phonics instruction at all. They also found that beginning teaching phonics in kindergarten and first grade was

more effective than beginning teaching it in later grades (Ehri, Nunes, Stahl, & Willows, 2001). Of particular importance is the teaching of phonics to students assessed to be at risk of reading difficulties. It has been suggested that the most common cause of reading difficulties is an inability to decode words, which can be rectified by phonics instruction (Rack, Snowling, & Olson, 1992).

Despite the widespread belief that systematic phonics instruction is highly effective in teaching children to read, Camilli and colleagues (2003, 2006) critiqued the work of the National Reading Panel (2000) and suggested that methodological flaws existed in the study and that the definition of systematic phonics instruction was not tight enough. They suggested that some studies, which were classed as systematic were unsystematic compared to others, and that the effect of tutoring and other literacy activities were not taken into account in the study (Camilli, Kim, & Vargas, 2008). They concluded that "the benefit of systematic phonics was small" (p. 8) and that "instruction has to make sense as a package of components" (p. 10). Thus rather than focusing on phonics instruction alone, a number of factors and skills need to be considered to ensure optimal reading instruction for students.

Early Literacy Intervention Programs

The challenge to give all children a good start in reading involves not only providing students with a broad range of literacy skills and experiences through effective instruction, but finding and implementing effective early literacy intervention programs for those students showing early signs of reading difficulty. The aim is to provide opportunities for all young students to acquire the early literacy skills they need to develop into proficient readers. Vellutino et al. (2006) concluded after a longitudinal study that

> early and long-term literacy difficulties can be prevented in most children at risk for such difficulties if they are identified at the beginning of kindergarten (if not sooner) and if appropriate intervention to establish foundational literacy skills is undertaken at the outset. (p. 163)

Numerous early literacy intervention programs designed to aid young students' development in foundational literacy skills and reading and writing have been tested and made available to teachers of young children.

Systematic and Engaging Early Literacy

One such reading intervention is SEEL, which is an early literacy approach designed to give students a sure foundation in early reading skills. Although many skills are addressed through SEEL, such as vocabulary development and comprehension, the particular curriculum focus in this study is phonological awareness and phonics development that aid in CVC word reading. SEEL's unique approach is flexible, explicit, intensive, and playful. Specific target skills are addressed through adult-led, child-friendly play, which can be adapted depending on the needs of the students.

SEEL instruction involves the combining of five principles which enable students to actively participate, learn, remember, and develop skills that will lead to reading. These five principles incorporate (a) creating meaningful instruction, (b) providing explicit teaching, (c) ensuring engaging and playful instruction, (d) providing intense exposure to targets, and (e) having reciprocal conversational exchanges between the teacher and the students. Following is a description of each of these five principles central to SEEL instruction.

Meaningful instruction. Meaningful instruction involves incorporating instruction into activities that are applicable and of interest to students. In writing about developmentally appropriate practices, Reutzel (1997) wrote,

> Reading and writing curriculum for young children should be integrated, connected, whole, and meaningful. … Young children learn best when they engage in topics, concepts, and events that move from self, near, and the familiar outward toward the social, distant, and the unfamiliar. (p. 232-233)

Meaning-based instruction for kindergarten students can be designed through arranging curriculum around child-centered themes and topics and using games, songs, dances, stories, plays, and other activities that appeal to the young child. Connecting these activities with reading and writing opportunities adds meaning and value to developing these literacy skills, as young students are able to increase their understanding for the purpose of reading and writing (McFadden, 1998).

The aim of SEEL is to make all instruction meaningful. SEEL lessons include activities that are child centered and based on experiences and interests that most young children have. Meaning can be created through students experiencing an activity for themselves. For example, playing with pink and purple play-dough, and making pancakes, pigs, and pizza with the play-dough highlight the initial /p/ sound as students are taking part in a meaningful activity. In all SEEL activities children are experiencing an activity related to the target, which adds greater meaning. Furthermore, encouraging students to link the target with their own personal experiences enhances understanding and adds meaning to the target.

Explicit teaching. Ellis and Worthington (1994) explored characteristics of effective teaching, which included explicitness. They suggested that explicit teaching involves clearly stating the goal of the lesson at the beginning and referring to it throughout the activity. Students should be made fully aware of what they are learning and why they are learning it. Explicit instruction involves providing students with effective modeling, supporting their practice in using the skill, and drawing their attention towards important aspects of the learning (Archer & Hughes, 2011; Learning Point Associates, 2004). Furthermore, pre-requisite knowledge needs to be reviewed at the beginning of the lesson; instruction should be logically sequenced; and clear and concise language needs to be used as step-by-step demonstrations are provided (Archer & Hughes, 2011).

SEEL instruction requires the teacher to make sure the students know exactly what they are learning by stating what they are going to learn, referring to the target frequently, and modeling and highlighting the target throughout instruction. At the beginning of the lesson, after creating a link between students' background knowledge and the activity they will be participating in, the teacher will state specifically what target skill they will be working on. For example, in a lesson named *Pat the Cat*, which focuses on the -*at* target, the teacher may say at the beginning,

> Have you ever seen a cat wearing a hat? Today we're going to meet a cat named Pat who likes to wear a hat! Pat, cat, and hat rhyme. They all end with -*at*. As we meet Pat the cat and his friends, listen for other words that end in -*at*.

Once the students have been told exactly what they are learning and what they need to do during the activity, the teacher explicitly reminds them of the target and repeatedly uses

target words containing the word chunk or initial sound they are practicing throughout the activity.

Intense exposure to targets. As the teacher frequently reminds students of the target and uses target words often throughout the activity, the result is students' intense exposure to targets. This principle is concerned with giving students plenty of exposure to the target sounds. Through songs, chants, and conversation, students not only hear the target sounds repeatedly but also verbalize them. Furthermore, students experience the target in print through reading and writing activities associated with the activity. The well-known phrase, "Practice makes perfect!" highlights the idea that doing the same thing over and over again will eventually lead to mastery and can be applied in developing the skills necessary for learning to read.

Hiebert and Martin (2001) reported on various studies looking at the number of exposures to a word it took children to identify it automatically. More able readers were able to recognize words with less exposure than poorer readers; however, one study showed that the speed of recognizing words increased for less able readers also, albeit at a slower rate than the more able readers. This suggests that students need to be exposed to target words numerous times, particularly those students who struggle in learning to read. Furthermore, Daly, Lentz, and Boyer (1996) suggested that "providing frequent opportunities to respond across diverse instructional materials" (p. 383) was necessary in students' learning. Thus giving students plenty of opportunities to respond using the target will help them in their ability and fluency in using the target.

During SEEL instruction the teacher uses target words repeatedly throughout the activity, providing students with the opportunity to hear the target multiple times. To

accomplish this, teachers use a range of techniques such as making comments about actions and objects, making playful statements, acknowledging students' responses, offering choices and turns, asking questions, and asking students to perform a task. The teacher is constantly finding ways to incorporate the target sounds and words naturally into the activity and conversation. Students are encouraged to not only listen for the target sounds but to also use the target sounds. This is accomplished through asking students questions that require them to use the target sounds and words or including songs and chants for students to participate in and use during the activity.

After playing with the target sounds and words auditory and orally, the target sounds are linked to their associated print, and students are given authentic opportunities to read and write target letters and words as part of the activity. For example, in the activity *Going on a T Treasure Trip*, where students are learning the letter *Tt* and the /t/ sound, students go on an adventure, similar to *Going on a Bear Hunt* by Michael Rosen (1989). The adventure includes lots of words beginning with the /t/ sound, such as tigers, toads, and tarantulas and requires students to use the /t/ sound throughout the activity. At the end of the activity, after having been chased by trolls, students are told by the teacher that each student needs to write the letter *Tt* ten times to make the trolls go away. Following this, students make a treasure map, writing the letter *Tt* next to all of the things they came across, and then write a journal entry to document their experiences on their treasure trip.

Engaging and playful instruction. Engaging and playful instruction requires the use of fun, playful activities designed to catch young children's attention and increase their motivation to learn to read and write. Although play seems to have been eliminated from

kindergarten somewhat in recent years, play has been valued as an important part of learning for young children for a long time. As stated by Graue (2009),

> Play, when choreographed thoughtfully, is one of the most powerful learning contexts available. In the hands of a skilled kindergarten teacher, play is a rich laboratory that can be used to teach multiple concepts simultaneously in a way that differentiates instruction. Two kinds of play are used in kindergarten—free play initiated by children and teacher-initiated learning experiences guided by an adult. (p. 14)

Although the play involved in SEEL instruction is highly structured and focuses on teaching specific literacy targets, the use of playful activities creates a more child-friendly, motivating learning environment. As young children are playing they are also developing literacy skills, which are an important part of the kindergarten curriculum.

During SEEL instruction students participate in playful activities centered around the target sound or word ending. Indeed, it is expected in SEEL that adults working with children do not just direct the playful activities but join in with the child-centered play itself. The teacher is encouraged to be playful with the students as they participate in the activities together. SEEL includes a range of child-centered, playful activities, including dramatic plays, puppet shows, storytelling, make-believe, arts and crafts, cooking, games, songs, dances, and acting on objects. Participating in these playful, engaging activities motivates students as they develop skills to help them in learning to read and write. Developing literacy skills that can be difficult for some students can thus become a more enjoyable, engaging activity.

Reciprocal exchanges. Although the playful instruction is orchestrated and led by an adult, listening to and responding to students' comments is particularly important in SEEL instruction. These are referred to as reciprocal exchanges. Through these reciprocal exchanges, children's knowledge can be validated, their understanding can be developed, and their exposure to the target can be increased.

The reciprocal exchanges that take place between the child and the teacher are manifest in the way in which the teacher listens and responds to the child's comments. The teacher not only validates the child's comments but is able to build on what they say using target sounds and words. For example, in the *Chip and Dip* activity, where students are practicing the *-ip* word ending while eating chips with dip, if a student were to say, "Can I have some dip?" The teacher could respond by saying, "Yes, you may dip your chip in the chip dip!" The result is increased exposure to the target word ending.

All of the SEEL activities discussed here can be accessed on the SEEL website (http://education.byu.edu/seel), along with many others.

SEEL Research

SEEL instruction has already been investigated in a number of settings. Culatta, Setzer, Wilson, and Aslett (2004) conducted a pilot study of SEEL in a dual-language Spanish speaking kindergarten classroom. Literacy skills were targeted in a number of contexts, including whole-class, small-group, transitions, and snack time. Literacy skills were also taught through the use of the computer. Qualitative data collected suggested high levels of engagement and enjoyment in participating in literacy activities and a high level of satisfaction was evident in students, parents, and the classroom teacher. Quantitative data showed that the majority of students made progress in a number of early

literacy skills. The researchers noted, however, that "the effectiveness of the instruction needs to be evaluated using tighter quantitative methods" (p. 137).

Culatta, Reese, and Setzer (2006) conducted a study to investigate the effectiveness of SEEL instruction in the development of early literacy skills of both English-speaking and Spanish-speaking students. Two classes of mixed Spanish-speaking and English-speaking students participated. One class was taught using alliteration targets for a six-week block and then rhyming targets for a further six-week block. The other class received rhyme instruction first and then alliteration instruction. Students were taught in their native or dominant language. Results comparing a pre-test with two post-tests showed an increase in all literacy skills tested (rhyme generation, rhyme recognition, sound alliteration, syllable alliteration, blending, and word recognition). Groups made greater gains in the skill for which they had received instruction at each post-test.

A similar cross-over study with a pre-test and two post-tests was conducted by Culatta et al. (2007). English-speaking and Spanish-speaking students in Headstart classrooms in Utah and Rhode Island participated in the study. Literacy instruction took place in a variety of contexts including whole-class, small-group, transitions, and snack time. Results showed an improvement in letter naming skills, though students experienced the greatest gains in rhyming skills. Greater improvement was observed in the English-speaking students, suggesting that adaptation may be required for the benefit of Spanish-speaking students.

A preliminary, quasi-experimental study by Bingham et al. (2010) examined the use of paraeducators in teaching small groups of students assessed to be in the bottom 20% of the class in literacy skills. SEEL instruction was given to these students in small groups

about three times per week. A comparison group received one-on-one tutoring in a district-approved program for kindergarten students at risk. Results showed greater literacy skill gains in the group receiving SEEL instruction. However, it was noted that students in the experimental group began the year with considerably lower literacy assessment scores, which may have affected the results.

Further investigation is needed to examine the use of SEEL with students assessed to be at-risk of having reading difficulties. The purpose of this study is to examine the effect of SEEL instruction with a small group of Tier 3 students, specifically in teaching them to read CVC words. The amount of exposure to SEEL instruction needed for these students to succeed in reading these CVC words will also be investigated, as well as the patterns in student learning that emerge.

Chapter 3: Method

Participants

The study took place in a public elementary school in the mountain west area of the USA. At the time of the study the school served 522 students from kindergarten to sixth grade. In terms of demographics, 35% of students qualified for free or reduced lunch, 86% of students were Caucasian, 9.2% of students were Hispanic, and the remaining 4.8% of students were Asian, African-American, or Pacific Islander. There were two kindergarten teachers in the school teaching three classes. One of the kindergarten classes was full-day and mostly consisted of students below grade level. The other two classes were half-day and consisted of students of varying levels, mostly students at or above grade level. Three of the students involved in this study belonged to the full-day kindergarten class and one of the students belonged to the morning half-day kindergarten class.

Student participants were identified as being Tier 3 and in need of intensive, supplemental literacy instruction. Three measures were used to classify the children: a local school district kindergarten assessment, the Dynamic Indicators of Basic Early Literacy Skills known as DIBELS (Good, Kaminski, Simmons, & Kame'enui, 2001), and a Formative 10-Week Assessment designed by the local school district literacy specialist. Students deemed to be at-risk for learning difficulties as indicated by these assessments were also assessed on an almost weekly basis using a short assessment created by the classroom teacher for the purpose of monitoring student progress. Either the classroom teachers or teachers' aides conducted all of these assessments. The local school district kindergarten assessment took place at the beginning and end of the school year to measure student growth over the whole year. The DIBELS assessment was conducted in October,

January, and April. The Formative 10-Week Assessment was conducted in January and March.

The local school district kindergarten assessment measured a variety of literacy and numeracy skills. Questions belonging to each category were interspersed throughout the assessment. The literacy part of the assessment totaled 135 points. Skills assessed in the assessment included writing the student's own name, recognizing beginning and ending sounds in words, recognizing and generating rhyming words, recognizing various concepts of print, naming uppercase and lowercase letters, associating letters with their sounds, reading CVC words, and reading sight words. This assessment took place the week before students started kindergarten. Students who had few of these basic skills were considered Tier 3.

Using DIBELS, students were tested on phonemic awareness fluency and alphabetic knowledge fluency. Prior to the commencement of this study students were tested using DIBELS in January. Students were given timed tests to see how many beginning sounds they could recognize in a minute, how many letters they could name in a minute, how many words they could segment into phonemes in a minute, and how many nonsense words they could read in a minute. Scores were entered into the computer and sent to the DIBELS Data System operated by the Center on Teaching and Learning at the University of Oregon. Students' scores were returned to the class teacher and indicated whether each student was at grade level, slightly below grade level, or significantly below grade level. Students assessed to be slightly below grade level were believed to be in need of strategic intervention, which could be interpreted as being at a Tier 2 level. Students assessed to be

significantly below grade level were believed to be in need of intensive intervention, which could be interpreted as being at a Tier 3 level.

The Formative 10-Week Assessment tested students on their phonemic and phonological awareness, alphabet and phonic knowledge, sight word reading, name writing, as well as some basic numeracy skills. Prior to the commencement of this study, students were tested during the first two weeks of January. Using the phonological awareness part of the assessment, students with a score of 20 or below out of a possible 35 were considered to be at-risk for reading difficulties and in need of literacy intervention.

Those students who showed signs of being below grade-level in these assessments were tested regularly, depending on the severity of their assessment scores. The classroom teachers created their own assessment tool for this purpose. This included testing upper case and lower case letter naming, letter-sound association, and sight word reading. At the beginning of this study, the classroom teachers expected students to be able to name all upper case and lower case letters, match 20 letters with their sounds, and read at least 18 sight words. This assessment was used to follow the progress made by the students and to help determine the intensity of intervention they would need.

In addition to the assessment data, teachers also considered student classroom performance and progress made to verify a student's need for literacy intervention. Speed of completing classroom tasks, quality of work, and student's processing abilities during tasks were all taken into account as to their Tier 3 status and need for supplemental literacy instruction. The tier system was fluid within the two classrooms and students moved in and out of tiers depending on literacy level and progress made. As students came from two different classrooms and as one of the classrooms contained a greater proportion

of students assessed to be below grade level than the other classroom, teachers' experience and perceptions of Tier 3 levels may have varied and thus the labeling of students as Tier 3 may have differed somewhat.

Four students were selected to take part in the intervention based on teacher recommendation, literacy assessment scores, and their ability to read some CVC words just prior to data collection. The researcher assessed students' ability to read the CVC words, which were displayed individually on a computer screen using a PowerPoint presentation. It was important that participants were unable to read the CVC words being taught and tested in the study prior to the administering of the intervention. Although some students qualified to take part in the study based on teacher recommendation and classroom assessment scores, they were able to read a number of the CVC words that would be part of the study and were therefore not selected to take part in this research. Two girls and two boys were selected: Katy, Amy, Evan, and David.

Once students had been selected, consent to work with them was obtained from the classroom teachers and students' parents. The researcher discussed the details of the research study with the classroom teachers and a consent form was signed by both of them. A letter was sent home to all parents of student participants outlining the details of the study, and a signed consent form was obtained from a parent of each participant prior to data collection.

Once consent had been obtained, the researcher conducted a preliminary assessment with each of the students, measuring lowercase letter naming, lowercase letter-sound association, rhyme recognition, rhyme generation, phoneme blending, and phoneme segmentation (see Appendix A). Two dyads were formed based on overall assessment data

of the students. Katy and Evan formed one dyad and David and Amy formed another dyad. Students at a similar level, as indicated by their assessment scores, were taught together as it was anticipated they would both reach the criterion-level for each target at a similar time and would thus be ready for the implementation of the intervention for the next target at approximately the same time. Background information was collected on each of the students by asking their parents and teachers a number of questions (see Appendix B).

Katy. At the beginning of data collection Katy was 5 years and 9 months old. She was living at home with her parents and two older sisters, aged 14 and 7. English was the only language spoken in her home, and Katy would be described as Caucasian American. Her parents said that she enjoyed activities such as hiking, biking, dressing up, and playing creatively. She participated in book reading with different family members about once or twice per week, which she enjoyed. Katy's teacher commented that on the whole she enjoyed coming to school, though she had a short attention span and often struggled to focus on her work. She excelled in art and had good handwriting. She enjoyed playing with friends and was able to socialize fairly well with her peers, though her poor speech sometimes caused difficulties in being understood.

Katy began the school year with a very low literacy score in the local school district kindergarten assessment, getting 11 points out of a total of 135. She was able to write her name, recognize one beginning sound, say the name of three uppercase letters, and recognize some concepts of print. In the 10-Week Formative Assessment conducted prior to data collection Katy got 18 points out of a possible 35 points in the phonemic awareness section of the test. She was able to recognize beginning sounds in words, but found deleting sounds from words and substituting sounds in words particularly difficult. Her

DIBELS score prior to data collection suggested that she was significantly below grade level and in need of intensive intervention. Her pre-assessment carried out by the researcher indicated that she knew the names of 21 lower case letters and was able to match 17 lower case letters with their sounds. She sometimes recognized words that rhymed and did not rhyme, but had difficulty with blending and segmenting words orally. Before the end of the study, Katy had been placed in a self-contained classroom where she spent half of the school day. The reason for her self-containment was a profound speech delay. She was diagnosed with over eight speech errors. A further problem in Katy's education was a high number of absences from school. Over the course of the year she totaled between 25 and 30 absences and also had numerous late starts and early finishes to school.

Evan. At the beginning of data collection Evan was 5 years and 10 months old. He was living with his father, grandmother, aunt, and cousin. His mother had passed away earlier in the year. His older brother and sister lived away from home. Evan's grandparents came from Cuba, Ecuador, and Spain, and one of his grandparents was Native American. Both of Evan's parents were born in the U.S., as was Evan. English was spoken in the home. His grandmother sometimes spoke in Spanish and even though Evan did not speak Spanish, he was able to understand it. His grandmother said that he enjoyed running around outside, riding his bike, and playing games. He enjoyed reading books with family members, which was part of his usual night-time routine. His grandmother said he was fairly confident though could sometimes be a little shy at first with his peers. Evan's grandmother and teacher described him as having a lovely disposition and being particularly kind and caring towards others. His teacher said he had a great desire to learn, a lot of perseverance, and a happy attitude.

Evan began the year with a very low literacy score. In the local school district kindergarten assessment he got 10 points out of a total of 135 in the literacy portion. He was able to write his name, recognize one ending sound in a word, name 6 uppercase letters, and recognize some concepts of print. He made good progress during the course of the year despite his difficulties. In the 10 Week Formative Assessment in January, Evan scored a total of 15 points out of 35 in the phonemic awareness section. He was successful with recognizing beginning sounds and blending spoken sounds into words. He found rhyming, segmenting words orally, deleting sounds from words, and substituting sounds in words particularly difficult. His DIBELS assessment, which took place in January, indicated that he was significantly below grade level and in need of intensive intervention. The pre-data collection assessment he took part in immediately prior to data collection indicated that he knew all lowercase letters by both name and sound. He was able to identify some rhyming words, but struggled with rhyme generation. He was able to orally blend sounds to make words, though he had difficulty orally segmenting words into phonemes. Evan's teacher described him as having a lack of spatial awareness, poor co-ordination, and poor short-term retention. He was also described as being very easily distracted. Towards the end of the year, Evan was diagnosed as having delayed processing and cognitive delay and was labeled with mild retardation. Shortly after this he was placed into a self-contained classroom where he spent half of his school day.

David. At the beginning of data collection David was 5 years and 11 months. He was living at home with his parents and three older siblings, aged 15, 11, and 9. David was born in the U.S., though his father came from Mexico and his mother came from Argentina. A mixture of Spanish and English was spoken in the home. His mother could speak only

Spanish, though his Father and siblings could speak both Spanish and English. David's parents said he enjoyed music and dancing, watching TV, and playing outside. His parents also reported that he enjoyed reading with a family member, usually his mother, approximately three times a week. His parents described him as being fairly confident, though a little shy at first. David's teacher said that he seemed to enjoy school and had a great desire to learn. His great attitude to learning and hard work resulted in fairly good progress throughout the year.

David began the school year with a very low literacy score. He got 7 points out of a total of 135 for the literacy part of the local school district kindergarten assessment. He got points for writing his name, recognizing beginning and ending sounds in some words, and having some concepts of print. His teacher said that his progress throughout the year was slow and steady. He continued to improve throughout the school year though made no major leaps forward. He was reported as sometimes having difficulty retaining things he had learned, which his teacher believed was probably a comprehension issue related to his English as a Second Language background. In his Formative 10 Week Assessment that took place in January, prior to the commencement of this study, David scored 19 points out of a possible 35 in the phonemic awareness section. He struggled with rhyming and deleting sounds from words and had some trouble with substituting sounds in words and identifying ending sounds. In the phonemic awareness assessment conducted by the researcher immediately prior to data collection, David was able to name 23 lower case letters and say the sound associated with 21 letters. He recognized some words that rhyme, but had difficulty generating rhyming words. He was able to successfully blend 8

out of 10 spoken words, and segment 7 out of 10 spoken words. His DIBELS scores prior to data collection suggested he was in need of some strategic intervention.

Amy. At the beginning of data collection Amy was 6 years and 4 months old. At the time of the study she was living at home with her parents and two of her five siblings, ranging in age from 21 to 7. Her oldest three siblings had already left home. Amy was adopted at the age of 2 from Haiti. Her parents described her as enjoying outdoor physical activities such as soccer, running, and swimming. They also said she enjoyed creative play and dress up. Although reading was not Amy's favorite activity, book sharing with a parent often took place in the evening as part of her bedtime routine. English was the only language spoken in the home, though up until the age of 2 Amy's language experience was mostly in Creole. Amy's parents and teacher described her as being socially confident and having a strong personality, which clashed with other strong personalities. She was described, however, as being generally friendly and enjoying playing with her brother, peers, and children slightly younger than herself. Her confidence was evident in her classroom participation and her teacher said she was always happy to contribute during whole-class work. Her teacher also said that her confidence could be a problem at times as she had a tendency to think she had understood and got things right when she had not.

Amy belonged to the half-day morning kindergarten class. She began kindergarten with fairly good literacy scores in the local district kindergarten assessment. Her assessment scores and seeming lack of progress just prior to data collection, however, concerned her teacher. She obtained 19 out of a possible 35 in the phonemic awareness assessment in January. She particularly struggled with deleting sounds from words, substituting sounds in words, and rhyming. In the January DIBELS test Amy was assessed

to be in need of some strategic intervention, though in some areas she assessed to be at grade level. In the phonemic awareness assessment conducted by the researcher immediately before data collection, Amy was able to identify all lowercase letter names and say the sounds of 25 of the letters. She used the /I/ sound for the letter *e*. Although she was hesitant, she recognized that 8 out of 10 pairs of words rhymed or did not rhyme. She did, however, find it difficult to generate rhyming words. She was good at orally blending words and was able to segment words, though mostly segmented in terms of onset and rhyme, rather than by phoneme.

Classroom Curriculum

During the study students were involved in their regular classroom activities. To teach literacy skills within the classroom, the teachers used both *Treasures* (Macmillan McGraw-Hill, 2007) and SEEL (Culatta et al., 2004). *Treasures* is a reading/language arts program produced by Macmillan McGraw-Hill which focuses on oral language development, spelling and vocabulary development, and inquiry skills. The teachers used only part of the *Treasures* program. They specifically used the sight word learning, vocabulary cards linked to books, and the *Treasures* guided reading books, in which students learned to read connected text in books. SEEL is an instructional approach designed to teach early literacy skills. Student participants were involved in whole class and center activities following the SEEL curriculum and they also took SEEL activities home to do with their parents almost every week. SEEL targets being learned and practiced within this research study were covered earlier in the year and were thus different to those being covered within the classroom at the time. Students were taught in a print-rich environment and several other regular literacy activities also took place, including shared

writing, journal writing, whole class story reading, vocabulary learning, and centers involving reading and writing. All of these activities took place on a daily basis.

Design

A single-subject, multiple-baseline-across-behaviors design (Baer, Wolf, & Risley, 1968; Kennedy, 2006) was employed to examine the effects of SEEL instructional activities with kindergartners in need of supplemental literacy instruction. This design was selected because experimental control could be achieved using a small number of students as they each act as their own control. Conditions could be manipulated to verify a functional relationship, establishing that the independent variable was responsible for the change in behavior and not some other factor. Within a classroom the number of students assessed to be in need of supplemental literacy instruction is usually low. The number of students available to work with in this study was characteristically small.

This design involved the testing of three similar yet different target behaviors: the ability of students to read words from the word families -*an*, -*ap*, and -*at*. It was important that the target behaviors being tested were similar, so that they would each be affected in the same way by the application of the independent variable. They needed to be different, however, so that individual behaviors would not be influenced as the independent variable was applied to one of the other behaviors (Cooper, Heron, & Heward, 2007). These target word families were taught to participants at the beginning of the kindergarten year in both a whole class and center-group setting. At the beginning of the study students demonstrated an inability to read words in these word families, however, soon into the study, as shown in the results section, two of the students were able to read words from all three word families. As a result of this, one of the dyads began working on a new data set

including three different target word groups: words beginning with the *ch* sound containing a short medial vowel other than *e*, words beginning with the *sh* sound containing a short medial vowel other than *e*, and words beginning with a blend containing a medial short *e* sound.

Systematic and Engaging Early Literacy was used to teach participants to read the target words, the implementation of which was the independent variable. Students were taught in pairs to read target words using SEEL instructional techniques described in the intervention portion of the Procedure section.

Measures

The effects of the intervention were tested by the students' ability to learn to read 18 target words (six words for each target word ending). The assessment took place before, during, and after the implementation of the intervention and involved students attempting to read the target words displayed randomly on a computer PowerPoint. Further details concerning the measures used are discussed in the following section.

Procedure

The procedure involved two distinct phases or conditions. The first phase was baseline assessment. The second phase was the application of the intervention, at which time assessment continued to take place immediately after each intervention lesson was administered.

Baseline assessments. In this initial phase of data collection, students were assessed individually on their ability to read all 18 target words [see table 1]. Baseline assessment continued daily until at least three to four baseline data points with no upward trend had been obtained. It was anticipated that the assessment portion of the experiment

could become frustrating and tedious for students. Strategies were used to attempt to reduce the negative effects of the repeated assessment on the students. It was explained to students that they may not have learned how to read these words yet, so if they did not know how to read a word they could just say, "I don't know!" and move on to the next word. Students were told before they began the assessment that they would get a prize on completion for trying their best, even if they were unable to read all of the words.

Table 1

Target Words Taught to Students

-*an* words	-*ap* words	-*at* words
fan	cap	cat
man	gap	fat
pan	lap	hat
ran	map	mat
tan	rap	pat
van	tap	rat

The assessment consisted of target words being displayed individually on a computer screen using a PowerPoint presentation. Students were asked to try to read each word and then press the button on the computer to see the next word. Words were displayed in the PowerPoint in a different sequence each time. To ensure a random order of words, 10 assessment PowerPoint documents labeled 1-10 were created. The order of the words was determined for each PowerPoint by pulling each target word randomly from

a box and entering it onto the PowerPoint. A different assessment was given to students each day. The assessments were video recorded, and results were obtained and recorded shortly after the assessment session.

As two of the students were able to read all of the target words before the intervention had been given for all of the targets, another set of words was added after performing informal assessments to find out targets the two students did not know. It was found that both students were not able to read *ch* and *sh*. One of the students found it difficult to read initial blends and the other student was unable to read words with a medial short *e* vowel. It was therefore decided that the first target would consist of words beginning with *ch* and containing a medial short vowel other than *e*; the second target would consist of words beginning with *sh* and containing a medial short vowel other than *e*; and the third target would consist of words with an initial blend and a medial short *e* sound. Each target word would end with a single consonant or the *ck* digraph. Target words used in this part of the research can be seen in Table 2.

Intervention. The intervention involved the implementation of SEEL (Culatta et al., 2004). The nature of the small student/teacher ratio in the study allowed the instructor to focus on the needs of individual students, thus incorporating instruction according to the level of the students being taught. It was anticipated that the intense exposure of the target given to students throughout the activity, and the meaningful and playful nature of the SEEL activities, would help students learn and remember the target word endings, thus enabling them to read the target words. To ensure student understanding, the sounds in target words were over-articulated, particularly the sounds of the medial vowel. The five principles of SEEL were incorporated into the instruction: (a) creating meaningful

activities, (b) providing explicit teaching, (c) participating in engaging and playful instruction, (d) providing intense exposure to targets, and (e) participating in reciprocal conversational exchanges with the students. Each of these principles was incorporated into each of the lessons.

Table 2

Second Set of Target Words Taught to Two of the Students

ch words	sh words	short e words
chat	shack	bled
chick	shin	fred
chin	ship	sled
chip	shop	sped
chop	shot	stem
chug	shut	step

Activity plans were downloaded from the SEEL website and additional activities were created when needed. The first target taught was the word ending -*at*. Three activity plans were used from the website: *Fat Bat*; *Is it a Rat a Cat, or a Bat*; and *Pat the Cat*. As students required additional exposure to the target, additional lessons incorporating the SEEL principles were created by the researcher.

To provide an example of a typical SEEL lesson, *Fat Bat*, which was the first lesson taught, will be described. This lesson involved blowing up a balloon, drawing a bat on it, playing with the bat balloon, using props such as a mat and a hat, and having students pat

the bat. The balloon was then set free, imitating the fat bat flying through the air and then going splat. The activity was meaningful to the students as they were already familiar with what a bat is and they enjoyed playing with balloons. Students were told explicitly at the beginning of the lesson what they were going to learn and that they needed to listen out for words that rhyme with bat throughout the activity. Lots of word play took place with the word ending -*at* during the activity. Students were able to both hear the target multiple times and were given opportunities to use it. The overuse of words ending with -*at* exposed students to the target sounds multiple times, and intensified students' awareness of the target. Students were engaged in the activity, as they were able to actively participate by playing with the bat, patting the bat, and letting the bat go splat, which they particularly enjoyed. It was evident that the activity was fun for students, as they wanted to repeat the game over and over again. The playful principle of SEEL was exhibited as the instructor and the students laughed and played enthusiastically with the bat balloon together. Students asked to write -*at* words on the whiteboard, so they were given time to do this after they had read each of the words that were used in the activity. The activity was then repeated and students were asked to find each word printed on a word card as it was said in the story.

Other SEEL lessons followed a similar pattern. Students were introduced to the activity, links were made to their prior knowledge, and the target being practiced was shared with them along with a few target words. This was followed by a child-friendly activity, such as a game, dance, art and craft, or puppet show, in which students had the opportunity to act on objects involving the target. The target was used multiple times by the instructor, and students were encouraged and given opportunities to use the target

multiple times through songs, chants, and conversation. Lessons were fairly flexible. If students showed a particular interest in doing something that was not on the plan and if it was deemed by the instructor to contribute to the lesson and help them learn the target, they were given time to do it.

Once both students in the dyad had reached the previously decided criterion level for the target, the second target was introduced which was the -*ap* word ending. The activity plans *Make a Cap* and *Tap Clap Rap* were downloaded from the website and used. Four additional lessons were created by the researcher for this target. One of these lessons was named *Get the Cap Through the Gap*, and was created by the researcher because one of the students had particular difficulty in reading the word *gap*. It was anticipated that multiple exposures to the word *gap* through this lesson would enable this student to begin reading the word.

At the end of intervention for the -*an* target, Amy and David were able to read all of the words for all three targets. It was therefore decided that Amy and David would begin working on three different targets: words beginning with *ch* and containing a short medial vowel other than *e*, words beginning with *sh* and containing a short medial vowel other than *e*, and initial blends (*bl*, *fr*, *sl*, *sp*, *st*) containing a medial short *e* vowel. While Amy and David began baseline assessment for these new targets, Evan and Katy continued to work on the -*ap* target. Once both students had reached criterion level for this target, work began on the -*an* target.

To teach the target words ending in -*an*, the activity plans *Dan the Gingerbread Man*, *I Can*, *The Tan Can*, and *Dan Ran and Ran* were downloaded from the SEEL website. Additional activity plans and extensions of existing plans relating to the -*an* target were

also created. Once students reached criterion level for this final target, review lessons covering all three targets were created and used.

To teach the initial *ch* target to Dyad 2, lessons taught included *Chomp and Chew*, *Cheer for the Champion*, and *Chimpanzees, Chickens, and Chipmunks*. To teach the initial *sh* target, lessons taught included the class activity for *Show and Share*, the home activity for *Show and Share*, and *Shelly Sheepdog Shreds Shoes*. All of these lessons were downloaded from the SEEL website. To teach the initial blend and medial short *e* target, lessons included *Eggs Everywhere*, *Exercise with Ed*, and *Ten Pets in the Bed*, each of which were downloaded from the SEEL website and adapted to incorporate an initial blend and medial short *e* target.

Students received SEEL instruction in two dyads. Each SEEL session lasted for approximately 20 minutes and took place daily from Monday to Thursday. If students had been absent from school during the week they received instruction on Friday also. Students received instruction in only one target at a time, apart from the final review sessions organized for Dyad 1 and the final target word group containing two targets (initial blends and a medial short *e* vowel) for Dyad 2. Several sessions of SEEL were taught across one target until students were able to read at least five of the six target words correctly in the assessment. The person who conducted all intervention sessions was a qualified teacher and had taught in public schools for approximately seven years. She had been involved with the SEEL project for over two years and had the responsibility of teaching SEEL center lessons, writing SEEL activity plans, and training others to do the same. As the order in which the targets were taught did not matter, the target to be taught

first was selected randomly by choosing one of three cards, each of which contained one of the target word endings.

Treatment fidelity. Intervention sessions were video recorded, and 30% of them were analyzed to check for the level at which the SEEL principles were present in intervention sessions. Two research assistants who were familiar with SEEL, having had experience in both teaching and writing SEEL activities, were trained together to analyze the lessons. The researcher created a treatment fidelity check sheet (see Appendix C), which contained questions focusing on each of the five principles of SEEL.

Research assistants were asked to rate the first two principles, *meaningfulness* and *explicitness* by answering some yes or no questions. For example, "Was the activity appropriate for kindergarten children?" and, "Did the instructor explicitly state the target at the beginning of the lesson?"

For the third principle, *playful and engaging*, research assistants were asked to answer five questions on a four-point scale (none of the time, some of the time, most of the time, or all of the time) to indicate the level at which instructor playfulness, student enjoyment, and student involvement was evident. An indication of most of the time (which was established as approximately 70-95% of the time) or all of the time (which was established as 95-100% of the time) was desirable for these ratings. While watching some training videos it was discussed with the research assistants that instructor playfulness was evident through tone of voice, facial expressions, making playful statements, joining in a fun activity, and laughing and playing with the students.

The fourth principle, *intense exposure to targets*, was determined by the number of times the instructor used target words and sounds during the activity and whether

students were given the opportunity to use the target words and sounds during the activity. Although SEEL does not specify a particular number of times the target should be used, for treatment fidelity purposes an arbitrary figure of an average of 10 times per minute was determined. It was decided that if the instructor used the target an average of 10 times per minute, this principle had been present. This would average to once every six seconds. Over a 20-minute lesson students would have heard the target at least 200 times. It was felt that this qualified as multiple exposures. This was an average over the entire lesson. During some parts of the lesson it would be expected that the instructor use the target more than at other times. For example, while students are focusing on writing, it would not be appropriate for the instructor to use the target at the same intensity as during the activity.

The fifth principle, *reciprocal exchanges*, was determined with two questions. The first asked if the instructor had listened to the students and responded to their actions and comments using the four-point scale (none of the time, some of the time, most of the time, or all of the time). The second question asked how many times this was observed throughout the lesson. The number of reciprocal exchanges often varied depending on the activity. Activities involving a lot of conversation tended to contain more instances where reciprocal exchanges were evident. Other activities, which involved a lot of singing and dancing, usually had some opportunities for reciprocal exchanges, but not as many. For this reason it was decided that some of the time would be an adequate response for this question to demonstrate that this principle was present.

After discussing the check sheet, the researcher and research assistants watched two SEEL videos, discussed each of the questions, and looked for examples in the videos

relating to each question. The research assistants were then both given a copy of the same video from the research and asked to rate it independently. Each research assistants' responses on the check sheet were compared to check for inter-observer agreement. As a straightforward score could not be obtained, it was decided that the overall score would be divided equally between the five principles. Each principle was therefore allocated 20% of the total score. If there were disagreements between the answers a certain proportion of the percentage would be removed from that 20%. For example, if the principle had four questions and if the research assistants did not agree on the answer for one of the questions 5% would be removed from the overall score. As the number of times the target was used throughout the activity was usually over 200 and sometimes exceeded 300, it was acceptable for students to be within 10 points of each other on the number of times the instructor used the target word. Over a 20-minute lesson this resulted in a difference of one word every two minutes.

A score of 86% agreement was obtained on the first lesson observed. Responses were discussed and the video was watched together. After discussing the first independently rated video, research assistants were given a second video, which they were asked to analyze and score on the treatment fidelity check sheet. For the second video an agreement score of 92% was obtained. Each research assistant was then given five or six lesson videos to independently determine the presence of each of the principles integral to SEEL instruction. These represented a total of 30% of all lessons taught during intervention.

Of the eleven lessons observed, all of them were deemed to be meaningful and explicitly taught. The research assistants felt that the different aspects of playfulness and

engagement were evident either most of the time or all of the time in all of the lessons. The instructor said the target at least ten times per minute for nine of the lessons with a mean exposure to targets across all 11 lessons of 12.5 times per minute. Students were given opportunities to use the target in all of the activities, and reciprocal exchanges were evident either some of the time or most of the time during all of the activities. The number of reciprocal exchanges evident in the lessons ranged between 1 and 17 with a mean of 5.5 times per session.

Continued assessment. Individual students were assessed repeatedly before, during, and after the implementation of the intervention. Continual assessment throughout this type of design was necessary to discover what students were already able and not able to do, to recognize the point at which students were able to read the target words, and to identify the likelihood of the intervention being responsible for a change in the target behavior.

Assessment took place immediately after each intervention session. Each student was asked to read the eighteen target words, as described in Baseline Assessment. Once the results for both students in a dyad reached a previously decided criterion-level of five out of six (83.3%) words read correctly for that target, the intervention was applied to a second target, and the process was repeated until the intervention had been applied to all three targets. For the intervention to be deemed effective and for experimental control to be achieved, it was important that results for each target behavior showed changes only after the intervention had been applied to that target behavior (Cooper, Heron, & Heward, 2007).

Students were assessed in the same order each day to keep conditions the same throughout the experiment. While one student completed the assessment task, the other student listened to music on some headphones while completing a drawing or writing assignment relating to the intervention activity. It was explained to students that they would receive a small prize after reading or trying to read some words on the computer and that they would be given this prize no matter how many words they read correctly. After both students had completed the assessment task they received a small prize before returning to their classroom.

Assessments were video recorded, and the results were recorded on an assessment sheet and Excel spreadsheet shortly after the assessment had taken place. Throughout each phase of data collection, a research assistant viewed 30% of assessment sessions to ensure reliability in assessment practices and agreement in results. The researcher and research assistant had an identical assessment sheet containing each of the target words (see Appendix D). The number of times the researcher and assessor agreed that the student read a word correctly or incorrectly was counted to determine the number of agreements. Similarly, the number of times the researcher and assessor disagreed that the student read a word correctly or incorrectly was counted to determine the number of disagreements. The percentage of inter-observer agreement was calculated to be 97% using the total count inter-observer agreement method (Cooper, Heron, & Heward, 2007). This method involved dividing the number of agreements by the total number of words assessed and multiplying by 100.

Pilot study. A pilot study was conducted earlier in the year to determine the feasibility of the study and also to refine the procedures. Six students were divided into

two groups of three and baseline, intervention, and maintenance data were collected. Target word endings *-it*, *-ip*, and *-in* were used in the study.

Two changes to the original procedure were made as a result of this pilot study. It was decided to work with students in groups of two rather than groups of three to limit too much variance between students. As students learn at different rates it was felt that it would be less complicated to only have to balance the learning rate of two students rather than three. It was also felt that teaching only two students together was appropriate for Tier 3 instruction. The second change that was made was related to the assessment procedure. It was decided to video record the assessment sessions, as students were often concerned with what the assessor was marking down on the assessment sheet. It was felt that if assessment sessions were video recorded students would not be pre-occupied and would not be able to see whether they had read the word correctly or not.

Social Validity

Teaching kindergarten students to read CVC words is an integral part of the kindergarten curriculum. For children to be able to learn to read they need to learn to connect sounds with print and begin blending the sounds together to read whole words and ultimately whole texts. This is important to students as it gives them a feeling of success in being able to read, and also provides the foundation to being able to read longer, more complex words and connected text.

Not only is it important to determine the social validity of the purpose of this study but also the acceptability of the intervention used for those for whom it has been designed. At the end of the intervention period therefore, student participants and their teachers were asked about their feelings towards the SEEL intervention. Students were asked

whether they enjoyed taking part in the activities. Their teachers were also asked to comment on SEEL and whether they thought using it as a literacy intervention was valuable. All of the students said they enjoyed taking part in the SEEL activities. This was also apparent in the enjoyment observed in the students during the activities. The classroom teachers said they enjoyed using SEEL in their classrooms in both whole class activities and in small group activities. They felt that the activities helped their students learn to read. They also stated that they believed SEEL would be a useful intervention for Tier 3 students.

Data Analysis

Data were plotted on individual graphs displaying both baseline assessment and intervention assessment information. Each student had a graph showing data collected for each target taught and assessed. As David and Amy participated in the collection of two sets of data they each had two graphs to represent their two data sets. Graphs consisted of a y-axis, displaying number of words read correctly, and an x-axis, displaying assessments carried out in chronological order. The graphs were systematically analyzed visually to determine the effectiveness of the intervention in teaching at-risk kindergarten students to read the target words belonging to the three word families. Several components of the graphs were analyzed: the trend that indicated the increase or decrease of data points in each phase of data collection; immediacy of results or the number of sessions it took for students to be able to read the target words following the implementation of the intervention on each target; the number of sessions it took for students to reach criterion level; overlapping data points between the baseline phase and other phases; and patterns that emerged between the application of the intervention for each target word ending

(Kennedy, 2006). Mean scores, standard deviation, and range for each phase of each target were calculated for each student. An effect size for each student's data set was calculated using mean standard difference (MSD), which involved finding the difference between the mean intervention score and the mean baseline score and dividing by the baseline standard deviation (Olive & Smith, 2005).

Chapter 4: Results

In this section, data for each participant within the two dyads are presented visually as a graph. A description is provided of the trend for each phase, immediacy of results, overlapping data points across phases, and the number of sessions it took to reach criterion level. Statistical data for each participant are also presented including mean, standard deviation, and range for each phase within each target. Within and across dyad comparisons are provided. Effect sizes for each participant's data set using standard mean difference (SMD) are given along with an overall effect size for the study using Cohen's effect size formula.

Performance of Participants Within the Dyads

Dyad 1. Katy and Evan belonged to Dyad 1. They participated in a total of 22 sessions. The first three sessions involved only baseline data collection. The number of intervention sessions for each target was determined by the amount of time it took both students to reach criterion level. The first five intervention sessions focused on words ending with -*at*. The following six intervention sessions focused on words ending with -*ap*. The next four intervention sessions focused on words ending with -*an*. The final four intervention sessions were spent reviewing all three targets.

***Katy*.** After being unable to read most of the target words during baseline, Katy succeeded in reaching criterion level for all three targets, though this was not maintained following the removal of the intervention. A review of the targets seemed to have a positive effect on Katy's ability to read the target words. Her mean score across all of the targets was 0.16 for the baseline phase. This rose to 3.46 during the intervention phase, then fell to 1.92 during the maintenance phase and rose again to 3.0 during the review

phase. The least variability in scores was experienced during the baseline phase and the most variability was during the intervention phase. The overall effect size for Katy's results using SMD was 6.87. Katy's results are described below and presented in Figure 1. Mean scores, standard deviation, and range for each individual target can be seen in Table 3.

-at Target. Baseline data showed that Katy was able to read two of the *-at* words before the intervention was administered, though not consistently. During the intervention phase her ability to read *-at* words increased in a positive upward trend. It took Katy five intervention sessions before she reached criterion level. Results during the maintenance phase, however, suggested that she did not retain the ability to read these words and results immediately dropped. There was a high percentage of overlapping data points across all phases for the *-at* target, though mean scores were slightly higher during the intervention, maintenance, and review phases than during baseline.

-ap Target. During baseline Katy was able to read only one *-ap* word on one of the days. Once intervention began her results showed an immediate improvement, though it took six intervention sessions before she reached criterion level. Although this was more sessions than either of the other targets, her results were generally higher and more stable during this phase for this target than the other two targets. There were no overlapping data points between the baseline and intervention phases. During the maintenance phase for the *-ap* target, results showed a marked decrease as compared with the intervention phase, though results were generally higher than those during baseline. Only one data point overlapped between the maintenance and baseline phases. The review phase

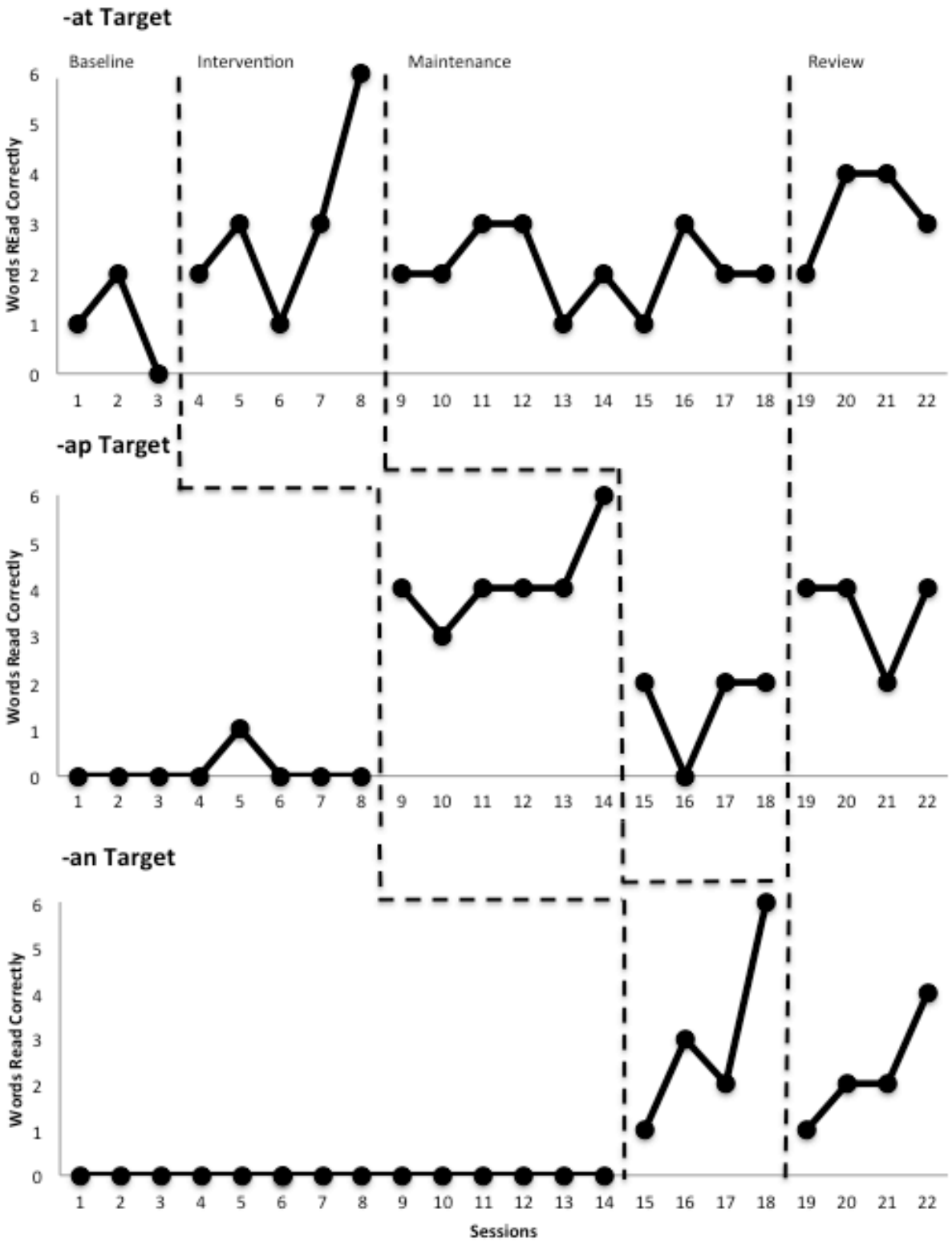

Figure 1: Katy's results for -*at*, -*ap*, and -*an* targets.

Table 3

Katy's Mean, Standard Deviation, and Range for all Targets, During Each Phase

Target	Phase	Mean	SD	Range
-*at*	Baseline	1	1	0-2
	Intervention	3	1.87	1-6
	Maintenance	2.1	0.73	1-3
	Review	3.25	0.95	2-4
-*ap*	Baseline	0.125	0.35	0-1
	Intervention	4.17	0.98	3-6
	Maintenance	1.5	1	0-2
	Review	3.5	1	2-4
-*an*	Baseline	0	0	0
	Intervention	3	2.16	1-6
	Maintenance	-	-	-
	Review	2	1.26	1-4

Note. There was no maintenance phase for the -*an* target as this was the last target taught before the review phase began.

showed an immediate increase in Katy's ability to read words ending in -*ap*, though the mean score during this phase was lower than the mean score during the intervention phase.

-*an Target.* During baseline Katy was unable to read any of the -*an* target words correctly. Intervention results showed an improvement, though not as immediate as with the -*ap* target. The trend during intervention was in a positive upward direction and looked very similar to the results for the -*at* target except that it took Katy only four intervention sessions to reach criterion level. There were no overlapping data points between the baseline phase and other phases for this target. There was no maintenance phase for the -*an* target, as the final four intervention sessions were used as a review of all three targets. After reading all six -*an* words correctly at the end of the intervention phase, Katy's scores decreased to only one word read correctly after the first review session. Her scores, however, improved again in a positive upward trend during the review phase.

Katy reached criterion level only once for each target throughout the study and was unable to sustain high scores during maintenance. The overall pattern for each target was an increase in scores from baseline to intervention and then a decrease in scores between the intervention phase and maintenance phase. There was a large difference between the last data point in the intervention phase and the first data point in the maintenance phase. It may therefore have been beneficial to work with Katy for one or two extra intervention sessions for each target after criterion level had been reached. This would have revealed whether the drop in results was due to a removal of the intervention. The review sessions showed an increase in results from the maintenance phase, thus suggesting the benefit of

revisiting targets. Overall, mean scores for the intervention, maintenance, and review phases were higher than for the baseline phase.

***Evan*.** Evan's mean baseline score was 1.24 compared to a mean intervention score of 4.67. His results remained fairly high with a mean score of 4.57 during the maintenance phase, and rose even higher to 5.33 during the review phase. Evan's overall effect size using SMD was 2.08. His results for each target are described below and presented in Figure 2. His mean scores, standard deviation and range for each target can be seen in Table 4.

-at Target. Evan was unable to read any of the words ending in *-at* during the baseline phase. He had immediate positive results when the intervention was administered. A positive upward trend was observed during this phase, and within three intervention sessions Evan had reached criterion level. Criterion level was maintained for the rest of the intervention phase. His results during the maintenance phase began high though showed a steady negative trend over the 10 maintenance sessions. During the review phase Evan's scores showed a positive upward trend, when he reached and maintained criterion level after two review sessions. There were no overlapping data points between baseline and any other phase of data collection.

-ap Target. During baseline Evan was able to read only one *-ap* word, though he had immediate positive results once intervention began. He reached criterion level after his second session. Although his scores continued just below criterion level, it took him an additional three sessions to be able to reach criterion level again. Evan's results showed a positive upward trend during this phase. He generally maintained high scores during the

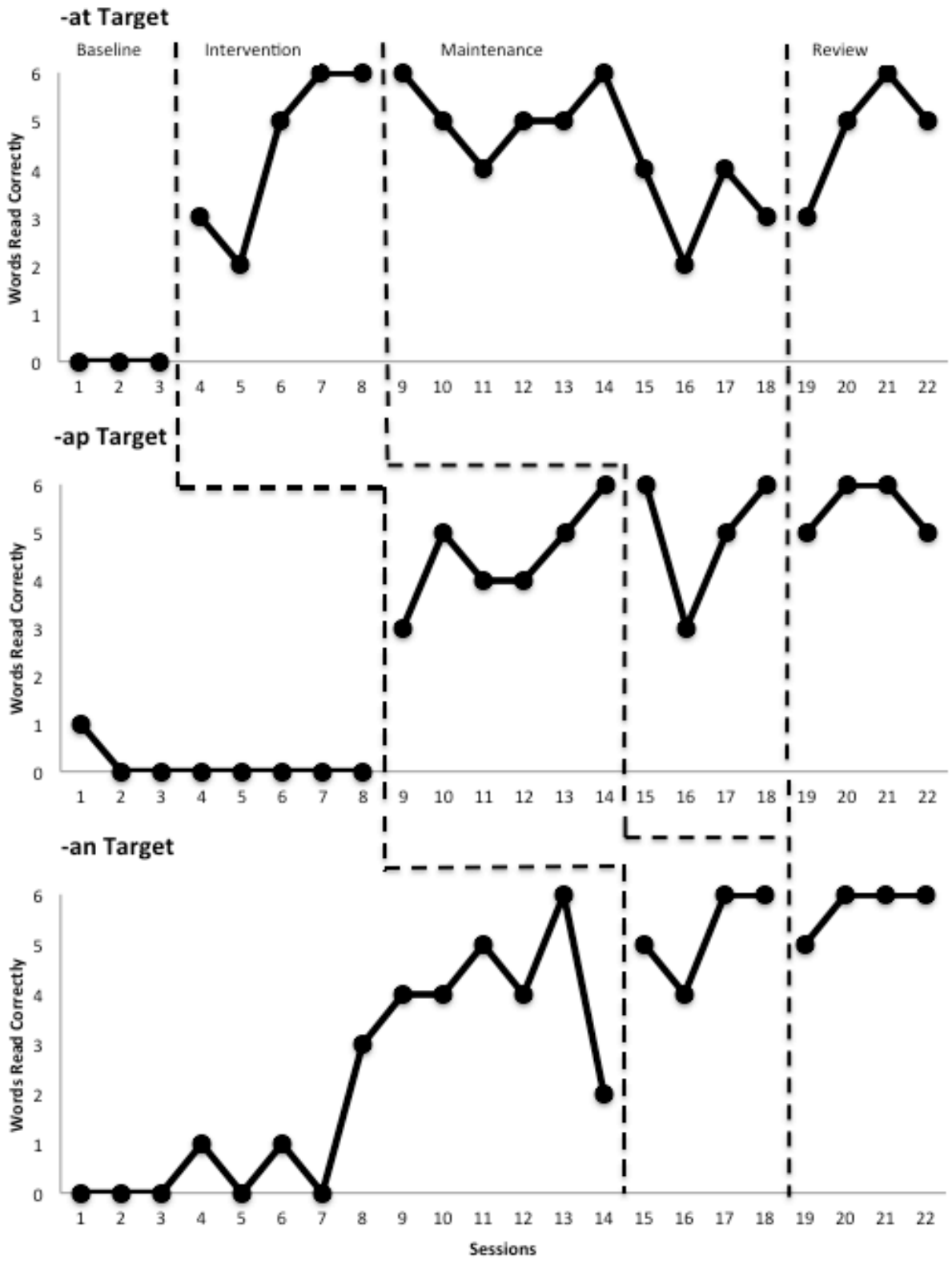

Figure 2. Evan's results for -*at*, -*ap*, and -*an* targets.

Table 4

Evan's Mean, Standard Deviation, and Range for all Targets, During Each Phase

Target	Phase	Mean	SD	Range
-*at*	Baseline	0	0	0
	Intervention	4.4	1.82	2-6
	Maintenance	4.4	1.26	2-6
	Review	4.75	1.25	3-6
-*ap*	Baseline	0.125	0.35	0-1
	Intervention	4.5	1.05	3-6
	Maintenance	5	1.41	3-6
	Review	5.5	0.58	5-6
-*an*	Baseline	2.14	2.14	0-6
	Intervention	5.25	0.96	4-6
	Maintenance	_	_	_
	Review	5.75	0.5	5-6

Note. There was no maintenance phase for the -*an* target as this was the last target taught before the review phase began.

maintenance phase. During the review phase Evan maintained his criterion level scores. Results from intervention through to the end of review showed a slight upward trend.

-an Target. A positive upward trend can be seen during the baseline phase for the *-an* target. Although Evan was unable to read any of the *-an* words during the first three baseline sessions before intervention for any target commenced, he started to read some of the words once intervention for the *-at* target began. While the *-ap* target was being taught Evan reached criterion level, which was maintained during the intervention and review phases. Although his mean scores during the intervention and review phases were higher than the mean score for the baseline phase, the graphs indicate that learning took place before the intervention began. All of the data points during intervention and review overlap with baseline data points because of this.

Evan's results for the *-an* target indicate that either he was able to generalize his learning from the *-at* and *-ap* targets to the *-an* target, or some external factor was influencing his ability to read words belonging to this target. His ability to read the *-an* words seems to follow his learning of the *-at* and *-ap* target words, suggesting generalization across targets. For each target he was reading the words at criterion level for at least two or three sessions before moving onto the next target, which may have solidified his learning and helped him maintain high scores to the end of the study. Furthermore, as Evan learned to read the target words for the previous two targets relatively quickly, this may have enabled him to apply that learning to another target more easily.

Dyad 1 student comparison. A comparison of Katy's and Evan's graphs reveals a number of similarities and differences in their results. Both students did reach criterion

level for all three targets, though for every target Evan reached criterion level before Katy. A similar upward trend can be seen for both students during the intervention phase for the -*at* target. A similar pattern is also evident during the intervention phase for the -*an* target, when both students had immediate results after the first intervention session and relatively high results for the remainder of that phase. One of the big differences in Evan's and Katy's results was that for the most part Evan maintained higher scores after the removal of the intervention, whereas Katy's scores fell quite dramatically. Another major difference between Evan and Katy was it seemed that Evan was able to generalize his learning, as his baseline results for the -*an* target appear to indicate. Reviewing the targets during the last four intervention sessions for Katy and Evan seemed to raise the scores for those targets that had fallen during the maintenance phase.

Dyad 2. David and Amy belonged to Dyad 2. They spent only 10 sessions on the -*at*, -*ap*, and -*an* targets. The first three sessions involved baseline data collection only. The next four sessions involved intervention for the -*at* target. The following three sessions involved intervention for the -*ap* target. By the end of the tenth session David and Amy were able to read all of the -*an* words, so intervention for this target was not administered. Three new targets were chosen: words beginning with *ch*, words beginning with *sh*, and words beginning with a blend containing a medial short *e* vowel and ending with a consonant. The words beginning with *ch* or *sh* contained a short medial vowel other than *e* and either ended with a single consonant or the *ck* digraph. Data were collected and intervention was administered for these new targets.

David. David's results for the -*at*, -*ap*, and -*an* targets are displayed in Figure 3. His mean score across targets rose from 1.65 during the baseline phase to 3.42 during the

intervention phase. The relatively high mean during baseline was a result of being able to read a number of target words during this phase. David reached criterion level for two of the targets during the baseline phase and almost reached criterion level for the other target during baseline. His results also show a fairly high degree of variability with a standard deviation score of 2.07 during intervention and 1.84 during baseline. Overall effect size for these targets was calculated at 0.96 using MSD. His mean scores, standard deviation, and range for each target can be see in Table 5.

-at Target. David was able to read some of the -*at* target words before intervention began with a score of four words read correctly for one of the baseline data points. During the intervention phase David's results started out low but showed a positive upward trend. He reached criterion level after four sessions. David's results fell initially during the maintenance period but showed a positive upward trend back to criterion level by the end of this phase. There were overlapping data points across all phases for this target.

-ap Target. David's ability to read words ending in -*ap* started off low but showed a positive upward trend during baseline, which corresponded with his ability to read the words ending in -*at*. His score remained fairly consistent during the intervention phase, in which only three data points were collected. Although David had reached criterion level during baseline, his score did slip to just below criterion level after the first day of intervention. He reached criterion level again after the second intervention session. There was no maintenance phase for this target because intervention ended for this set of words at the end of the -*ap* intervention. This was because although David was unable to read any

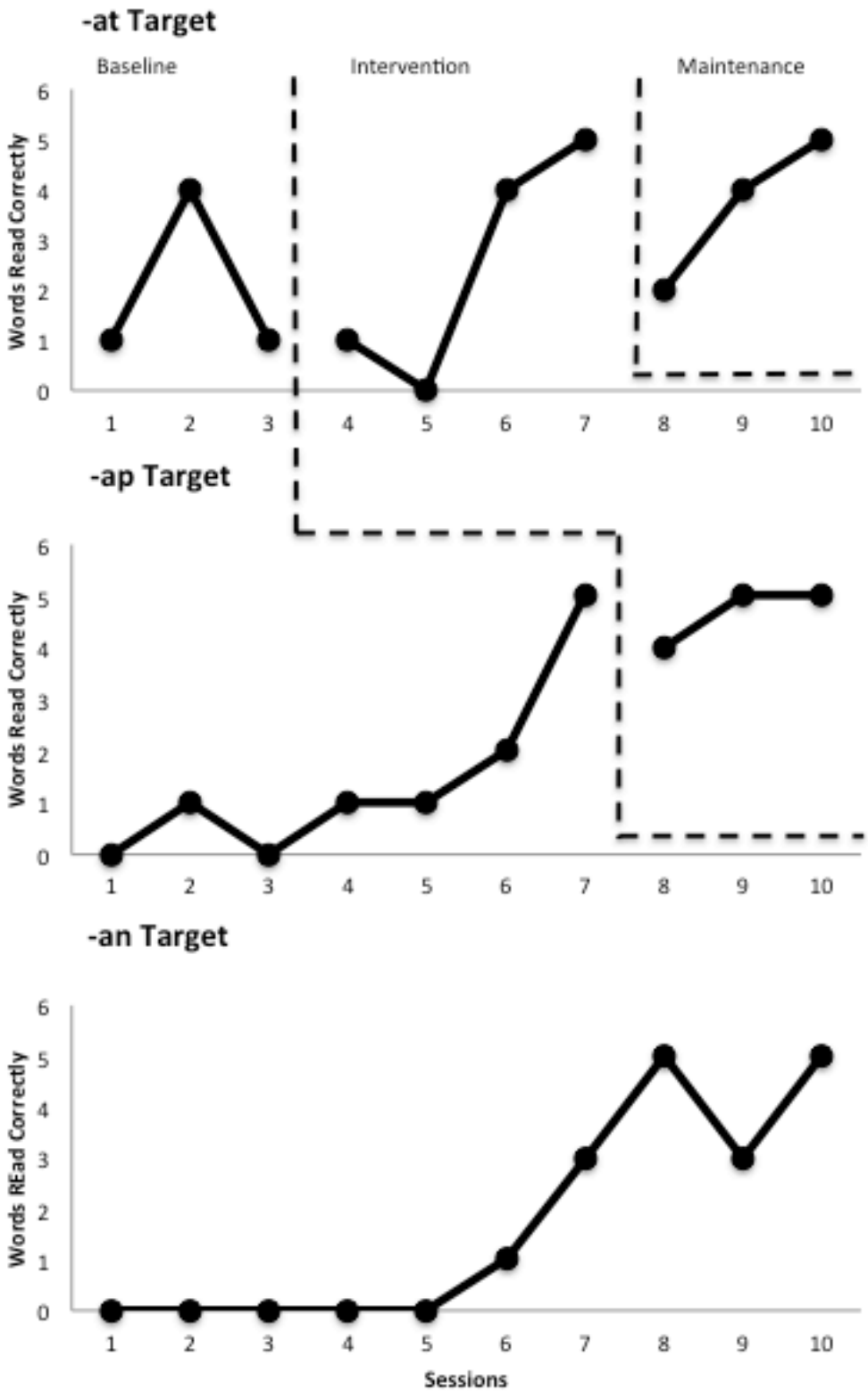

Figure 3. David's results for *-at*, *-ap*, and *-an* targets.

Table 5

David's Mean, Standard Deviation, and Range for all Targets, During Each Phase

Target	Phase	Mean	SD	Range
-*at*	Baseline	2	1.73	1-4
	Intervention	2.5	2.38	0-5
	Maintenance	3.66	1.52	2-5
-*ap*	Baseline	1.42	1.71	0-5
	Intervention	4.66	0.57	4-5
-*an*	Baseline	1.7	2.1	0-5
ch	Baseline	0	0	0
	Intervention	3	2	1-5
	Maintenance	5.57	0.53	5-6
sh	Baseline	0	0	0
	Intervention	5	1.73	3-6
	Maintenance	4	0.81	3-5
-*e*-	Baseline	1.2	0.78	0-2
	Intervention	2.5	0.57	2-3

Note. There was no intervention or maintenance phase for the –*an* target, as David learned to read the target words during the baseline phase of this target. There was no maintenance phase for the –*ap*, and –*e*– targets.

of the -*an* words at the beginning of baseline, there was a positive upward trend during this phase, by the end of which, he had reached criterion level for the -*an* target.

David's results for each of the targets seemed to increase at approximately the same time and at approximately the same rate. This may have been because he was able to generalize the learning of the -*at* target to the other two targets. Teaching during these intervention sessions emphasized looking at all of the letters in the correct order in each word and associating them with their sounds. If a student therefore knew all of the letters and their associated sounds it is highly possible to be able to transfer this skill of decoding every letter to reading other word endings also.

After completing learning for the first set of targets, a second set of words were introduced to David comprising words beginning with *ch*, words beginning with *sh*, and words beginning with a blend containing a short medial *e* vowel. David's results for this second set of words are presented in Figure 4. Mean scores for these targets started at 0.57 during baseline and rose to 3.4 during intervention. The mean score during maintenance was 5.0 suggesting that David was able to retain his learning. A breakdown of mean scores, standard deviation, and range for each phase of each target can be seen in Table 5. An overall effect size using MSD for these targets was calculated at 3.48. A visual analysis of each target will follow.

Initial ch target. David was unable to read any of the words beginning with *ch* during the baseline phase. Results show a positive upward trend during intervention. After the first intervention session David was able to read one of the words. His results improved consistently over the course of the next two intervention sessions. By the third intervention session David had reached criterion level. His scores remained high

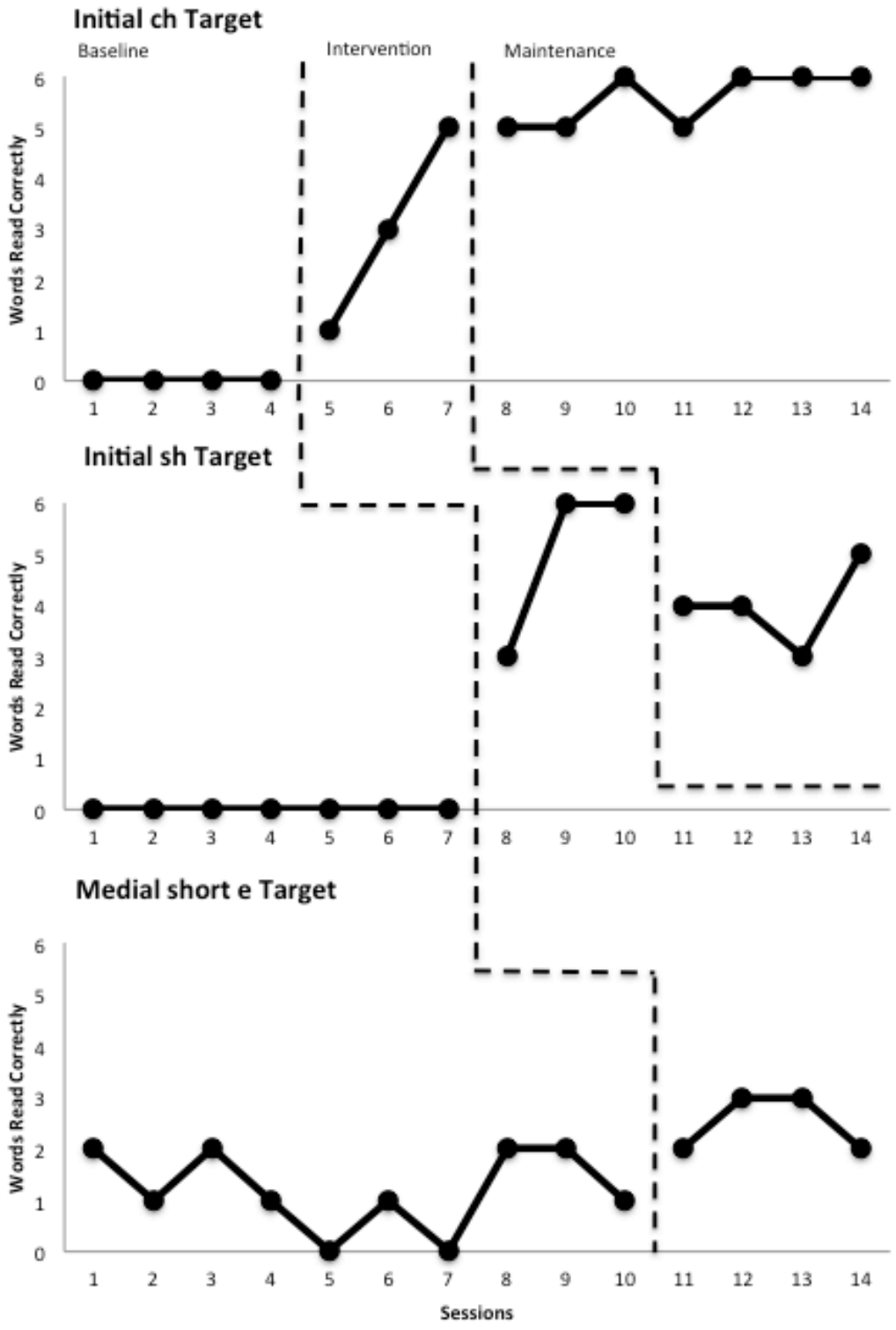

Figure 4. David's results for initial *ch*, initial *sh*, and initial blend with medial short *e* targets.

throughout the maintenance phase. There were no overlapping data points between the baseline phase and intervention phase.

Initial sh target. David was unable to read any of the words beginning with *sh* during the baseline phase. He showed an immediate improvement after the first intervention session, when he was able to read three of the words correctly. His results continued to improve to criterion level after the second intervention session. His results dropped slightly, however, during the maintenance phase. A closer look at David's assessment responses during this phase revealed that the words he got wrong were largely due to saying the /tʃ/ (*ch*) sound instead of the /ʃ/ (*sh*) sound. As the letter combinations *ch* and *sh* are so similar and as he was taught these two targets so closely together it is not completely unexpected that he would mix them up somewhat.

Initial blend and medial short e target. David was able to read some of these words right from the beginning of baseline and read an average of 1.2 words correctly during this phase. He was already able to read the medial letter *e* and final consonant for this target. He had difficulty, however, in blending the initial sounds, though he did understand the concept of saying every sound in a word. When he was reading the words he usually said every sound first and then tried to blend them all together. Though he was successful at this sometimes, his ability to do this was not strong enough to be able to do it consistently. During the intervention phase his results rose slightly, however, there were overlapping data points between the baseline and intervention phases. As the school year was coming to a close and due to child absence only four intervention sessions focused on this target. Results show a very slight improvement between baseline and intervention, but the change was not strong enough to declare success with this target.

Amy. Amy's results for the -*at*, -*ap*, and -*an* targets can be seen in Figure 5. Mean scores across targets revealed little difference between baseline and intervention phases with mean scores of 3.2 and 3.72 respectively. Similarly, a high degree of variance in scores for both phases was calculated with a standard deviation of 2.65 for baseline and 2.57 for intervention. Mean scores, standard deviation, and range for each phase of each target are presented in Table 6. An overall effect size using MSD was calculated at 0.19 suggesting little effect of the intervention.

-at Target. Although Amy was unable to read any of the -*at* words during the initial baseline phase, her results showed an immediate improvement and after the first intervention session she reached criterion level. This remained consistent across both the intervention and maintenance phases. There were no overlapping data points between the baseline phase and other phases for this target.

-ap Target. The initial three baseline data points before any intervention was administered showed that Amy was unable to read any of the -*ap* words. However, after one intervention session for the -*at* target, Amy reached criterion level for the -*ap* target. Baseline data showed an upward trend. Amy maintained criterion level for the -*ap* target during intervention for this target. All data points in the intervention phase overlapped with data points in the baseline phase.

-an Target. Although Amy demonstrated an inability to read the -*an* words on the first day of the baseline phase, on the second day of this phase she read words at criterion level for this target. Amy was thus able to read words ending with -*an* before any intervention was administered. A closer look at Amy's responses on the first day of

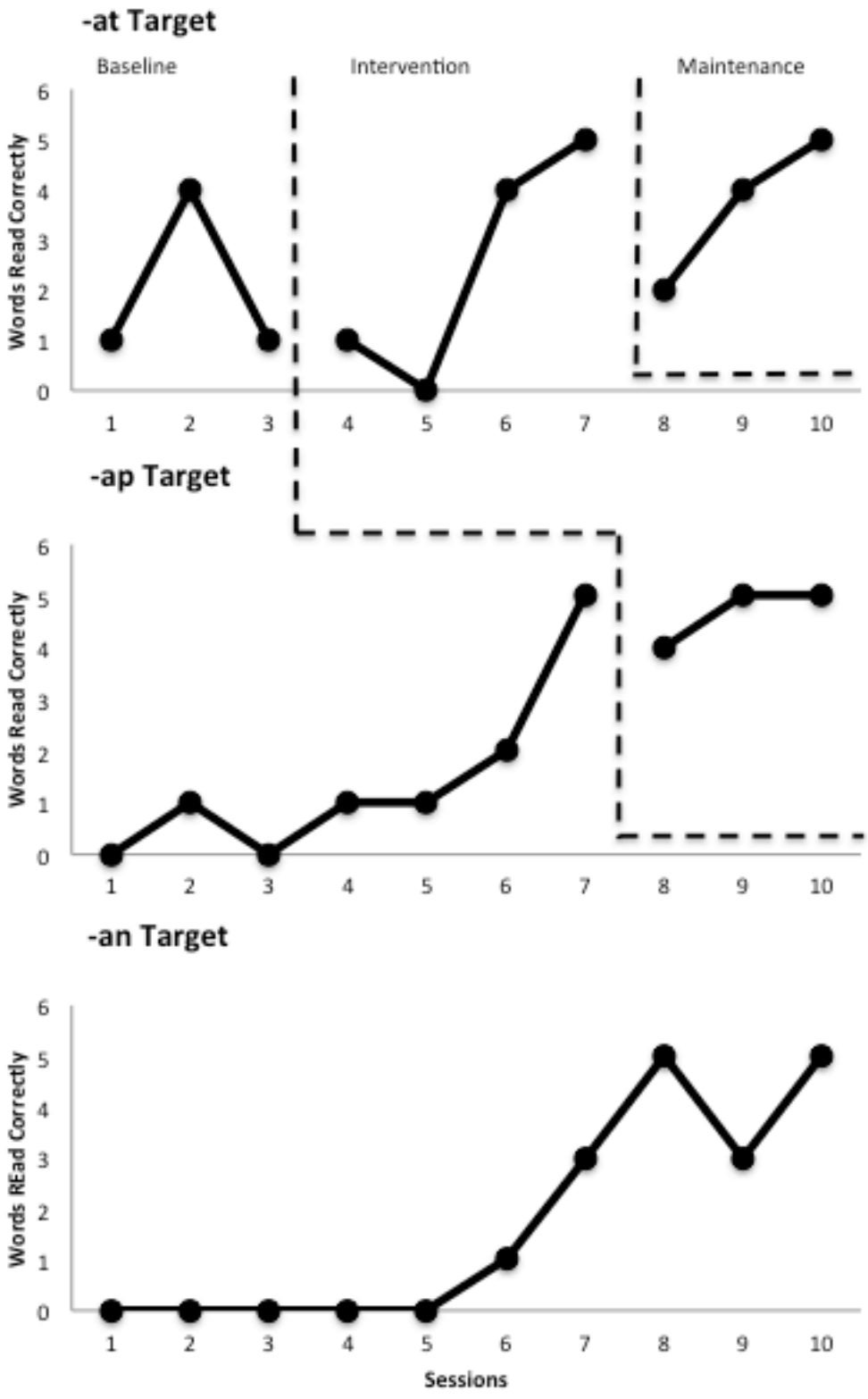

Figure 5. Amy's results for the *-at*, *-ap*, and *-an* targets.

Table 6

Amy's Mean, Standard Deviation, and Range for all Targets, During Each Phase

Target	Phase	Mean	SD	Range
-at	Baseline	0	0	0
	Intervention	5.5	1	4-6
	Maintenance	5.3	0.57	5-6
-ap	Baseline	2.71	2.69	0-6
	Intervention	5.66	0.57	5-6
-an	Baseline	4.5	2.12	0-6
ch	Baseline	0	0	0
	Intervention	4.66	2.3	2-6
	Maintenance	5.71	0.48	5-6
sh	Baseline	0	0	0
	Intervention	2	2.64	0-5
	Maintenance	4.75	1.89	2-6
-e-	Baseline	0	0	0
	Intervention	0.75	0.95	0-2

Note. There was no intervention or maintenance phase for the *-an* target, as Amy learned to read the target words during the baseline phase of this target. There was no maintenance phase for the *-ap* and *-e-* targets.

baseline data collection revealed that she was mis-reading the medial letter a, and instead saying the /I/ sound for most of the words. It is also interesting to note that she was using the final /n/ sound for most of the -*ap* and -*at* words as well as the -*an* words during these first three baseline sessions.

During the second and third baseline sessions Amy was reading the initial consonant and medial vowel correctly for almost all of the words. After the first -*at* intervention session her results show that for the five words Amy got wrong she used a final /t/ sound instead of the correct /n/ or /p/. During the fifth data collection session, when Amy got her lowest scores, she was again mixing up the /n/ and /t/ sounds. It seems apparent that Amy's biggest problem in reading the words initially was not looking properly at the final letter in the words. After emphasizing during instruction the need to look at all of the letters in a word, she immediately responded and began reading all the words correctly. As Amy was confident in reading all of the letters and associating them with their correct sounds, as demonstrated in the pre-assessment, it was easy for her to generalize her learning for the -*at* words to the -*ap* words also. She had already demonstrated that she was able to read the -*an* words, however, Amy's consistently high scores with the -*an* target came after she had seemed to grasp the ability to look carefully at all of the letters in a word.

After reaching criterion level on all targets within the first data set, data collection and intervention began on a second set of words. A visual representation of Amy's results for this second set of target words can be seen in Figure 6. Mean scores across all three targets in this set of words rose from 0 during baseline to 2.3 during intervention to 5.36 during maintenance. Intervention scores showed a high degree of variability compared

with maintenance. Mean scores, standard deviation, and range for each phase of these targets are presented in Table 6. It was not possible to work out the effect size with the MSD formula using the baseline standard deviation, as this was zero.

Initial ch target. Amy was unable to read any of the *ch* target words during the baseline phase. The intervention showed immediate results with a positive upward trend. Amy was able to read two of the words after the first intervention session, and by the second intervention session she had reached criterion level. Amy was able to maintain criterion level scores throughout the maintenance phase for this target and she had no overlapping data points between baseline and the other phases.

Initial sh target. During the baseline phase Amy was unable to read any of the words beginning with *sh*. Her results during intervention were not as dramatic as with the *ch* target, though she was able to read one of the words after the intervention session. The word that she read correctly was the second word in the assessment. She regressed to no words read correctly after the second intervention session. A closer look at Amy's responses during this assessment session revealed that she was still unsure of the *sh* letter combination. Although she read every word ending correctly, her responses for the initial *sh* digraph were mixed. Sometimes she said the /tʃ/ sound and other times she just said the /s/ sound. After the third intervention session, however, Amy reached criterion level. Maintenance phase showed a drop in results suggesting that Amy had not been fully confident with the *sh* target, however, her scores quickly returned to criterion level. Her results generally showed a positive upward trend during both the intervention phase and maintenance phase. There was one overlapping data point between the intervention phase and baseline phase.

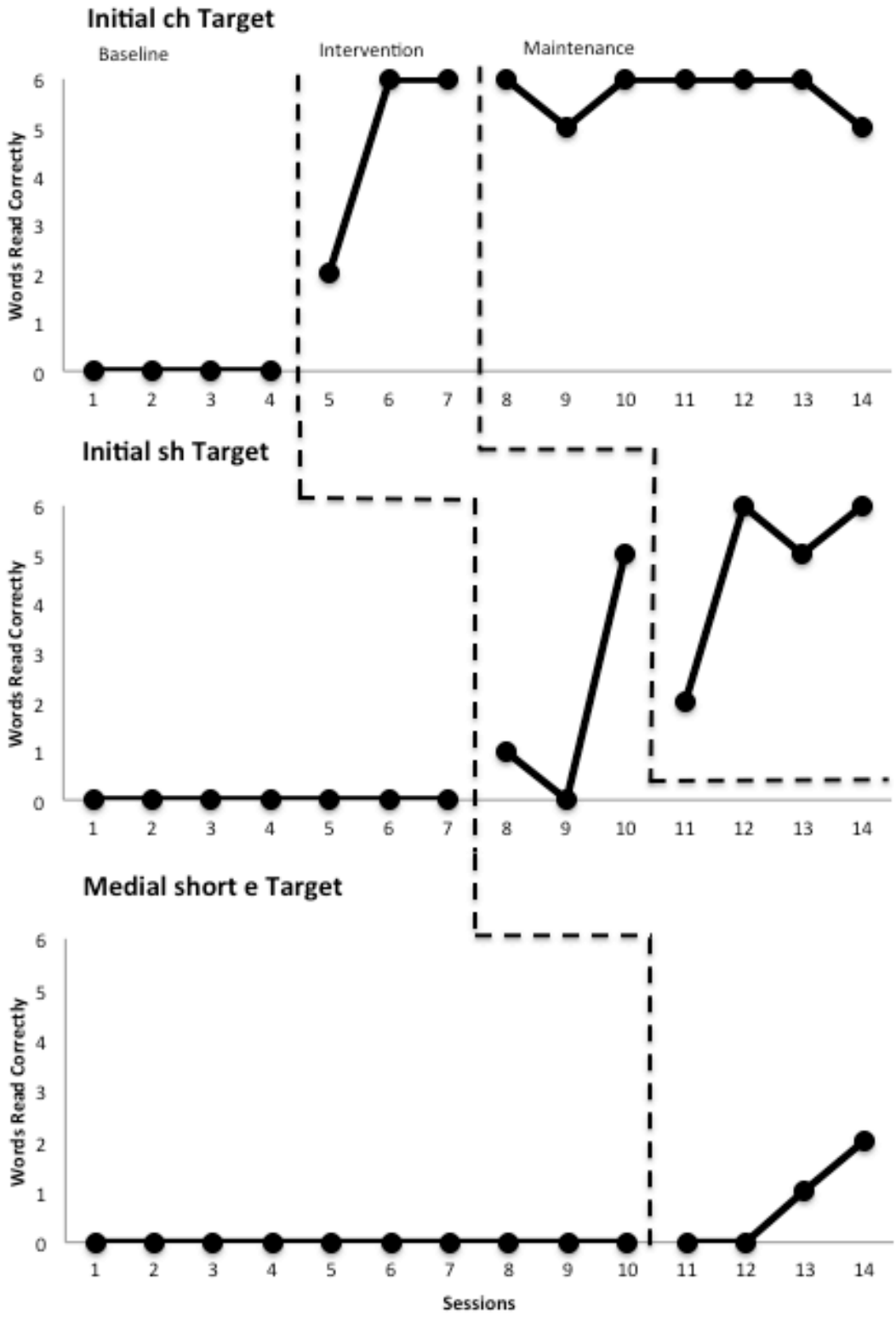

Figure 6. Amy's results for initial *ch*, initial *sh*, and initial blend with medial short *e* vowel targets.

Initial blend and medial short e target. Amy was unable to read any of the short *e* target words during the baseline phase and continued to struggle during intervention. Though her results do show a positive upward trend, Amy was unable to reach criterion level during the four intervention sessions that were available for this target. The positive upward trend, however, suggests that had intervention continued Amy's ability to read these words would have increased.

Amy read the medial *e* vowel as an /I/ sound from the beginning of baseline. She seemed fairly confident in reading these words from the beginning and so thought she was reading them correctly. For the most part she was able to read the initial blend, but because she thought the letter *e* said /I/ she was unable to read the word correctly. Due to the nature of the research this was not corrected until intervention for this target began. Thus Amy had read these target words incorrectly during 10 assessment sessions thinking she was reading them correctly. During the intervention phase it was necessary to revert this misconception and teach her to read the words correctly. During the last intervention session the two words she read correctly were the first and third words in the assessment. By the sixth word in the assessment she reverted to saying /I/ instead of /ɛ/ again. Her mean score for words read correctly during this phase was 0.75 with a standard deviation of 0.96. During intervention for this target, Amy was often able to read the words correctly, though sometimes she did still revert to saying the /I/ sound and had to be reminded that the letter *e* says /ɛ/. However, her assessment results suggest that she did not have a sound concept of this, and once support was taken away she reverted to her previous understanding.

Dyad 2 student comparison. David's and Amy's results for the first data set were similar in a number of ways. Both students reached criterion level for all targets, though Amy reached criterion level first for almost every target. Both students reached criterion level for the -*ap* and -*an* targets during baseline. David's ability to read these target words occurred gradually. Amy's ability to read the words was more immediate, progressing from a score of zero during one assessment session to a score of five or six words the next session. Once criterion level had been reached Amy was usually able to maintain criterion level scores during maintenance. David's scores often fell before climbing to criterion level again.

Amy's and David's results for their second data set were very similar. They were both unable to read any of the *ch* and *sh* words during baseline, however, intervention seemed to have an immediate effect on results, and they both reached criterion level on both of the targets within two or three intervention sessions. Although David was able to read some of the words during baseline for the short *e* target and Amy was unable to read any of the words, neither of them reached criterion level during intervention for this target.

Their difficulties with this target were different. David found blending the initial sounds difficult, though he did understand the concept, whereas Amy had learned that the medial letter *e* made the /I/ sound rather than the /ɛ/ sound. Thus she had to unlearn something she thought she had learned correctly. Although during intervention for this target David was told that he needed to work on blending the beginning sounds and some time was given to this for David, more time was spent on the medial *e* vowel for Amy. It would probably have been better for David had initial blends been the main focus of the

intervention. Both students, however, did show a little progress with this target within the four intervention sessions that were available, though neither reached criterion level.

Comparison of Student Performance Across Dyads

A comparison across the two dyads revealed that the second dyad needed less time to learn to read the targets. Furthermore, they seemed to be able to generalize their learning more easily as both students had reached criterion level for two targets before intervention for those targets had been administered. Additionally, a visual analysis suggests that their results seemed to be a little more stable than the results for the first dyad, whose results seemed to fluctuate up and down a little more. For the most part, the second dyad was able to maintain scores once they had been obtained, whereas the students in the first dyad seemed to be a little less consistent in their ability to read the target words.

Effect Sizes

Katy experienced the biggest effect size of 6.87. She seemed to have the greatest difficulty in reading the target words and retaining her learning throughout the study. The large effect size for Katy is a result of being unable to read almost all of the words during the baseline phase, unlike the other students. In comparison, Evan, David, and Amy, who all reached criterion level for at least one of the targets during baseline, had lower effect sizes of 2.08, 0.96, and 0.19 respectively. These effect sizes are for David's and Amy's first data set. David's effect size for his second data set was fairly high at 3.48. He was unable to read any of the words for the first two targets of this data set during baseline but learned to read the words quickly after intervention began. This effect size may have been higher had more time been available to reach criterion level for the final target. Amy had similar

results to David for this second data set, though an effect size could not be obtained, as her baseline score for all three targets was 0, which meant a baseline standard deviation was not available to calculate the effect size.

The effect size across the whole study using Cohen's *r* value was calculated at 0.54. Mean baseline and mean intervention scores along with their standard deviations were used to calculate this score. This suggests a fairly large difference between the baseline results and intervention results.

Chapter 5: Discussion

Overall, a moderate to large effect size was obtained in the study, according to Cohen's formula. Criterion level was reached for all targets with the exception of the final target for David and Amy. However, the results suggest that with additional time, they would have likely reached criterion level for this target also. The large effect size, and the fact that students learned to read the target words, suggests that SEEL was effective in teaching Tier 3 students to read CVC words. However, a closer examination of the results is needed to obtain a more complete understanding. Implications for practice will now be discussed, followed by factors that influenced the results and suggestions for further research.

Implications for Practice

After reflecting on the findings of the study, two different issues were identified for teachers to consider in working with Tier 3 students at an intervention level: accommodating individual differences within small groups and the importance of revisiting targets.

Accommodating individual differences. Even when students are grouped homogeneously, individual needs still have to be met. Data in this study indicated two situations that teachers may need to consider in accommodating individual needs while working with small groups of students at an intervention level: differing requirements in exposure to targets, and differing requirements in learning content.

Differing levels in exposure to targets. It was apparent from the results that students required different amounts of exposure to the targets. The number of intervention sessions to reach criterion level required by different students for different

targets varied between one and six. For example, Amy needed only one intervention session to be able to read all target words ending in -*at*, whereas Katy needed five intervention sessions to reach criterion level for words ending in -*at*. Furthermore, as soon as the intervention was removed Katy's scores fell dramatically from six words read correctly to one or two words read correctly, unlike the other students who generally maintained criterion level scores during the maintenance phase. This indicates that more time spent on each target may have been beneficial for Katy. Despite the multiple exposures Katy was given to the target, Hiebert & Martin (2001) noted that some students need far greater exposure than others. More time to practice the target after reaching criterion level may have enabled her to develop greater skill in reading the target words and thus retain her learning. In contrast, Evan, who received two or three intervention sessions after he had reached criterion level for each target, was able to retain higher scores during the maintenance period. This may have been because Evan was given time to practice reading and writing the target after he had already learned to read the words correctly, which may have resulted in a deeper knowledge of the target, which led to a greater retention of his learning.

During the intervention phase the researcher felt it would have been better for Evan to be moved on to the next target sooner. However, the data indicate a positive outcome as his learning and understanding seemed to deepen through further teaching and practice of the target. This scenario highlights a predicament that teachers in the classroom often encounter. Students are often grouped according to level for certain aspects of their learning and, whilst these groups can be formed with students of a similar level, learning still takes place at different rates for different students. Decisions have to be made as to

when to move those students on who have already understood the target. Results from this study would suggest that a little extra practice time can be beneficial as students' understanding and knowledge can deepen and solidify. That is not to say that students should be held back for long periods, but that an appropriate amount of extra practice time can be constructive.

Differing learning objectives. As well as the varying learning rates of students within groups, there is also the potential difficulty of students having different needs with learning targets. For example in this study, David and Amy had different difficulties with the final target words. David found it difficult to read initial blends, whereas Amy was unable to read the medial vowel. To individualize the instruction two targets were taught together, each of which were aimed at different students. Although students in this study demonstrated some progress when two targets were taught together, after four intervention sessions neither student demonstrated competence in reading the target words. This may indicate that individualizing instruction to the extent that two targets are being taught for two different students within one group is not effective. However, there was insufficient time to fully understand further progress that may have been made. The need for teachers to adjust the instruction within a small group and issues that can arise are highlighted here.

Revisiting targets. As Katy's scores fell for all of the targets during maintenance and as Evan's scores fell gradually over time for the -*at* target, a review phase was added to the study for Dyad 1. Although Evan had shown proficiency in the -*at* target for three sessions during the intervention phase, over ten sessions of maintenance, his scores revealed a downward trend. This suggests that even though students appear to know a

target, over time they can forget it. In the cases where scores had decreased during the maintenance phase for Katy and Evan, it was found that scores increased again during the review phase, suggesting that reviewing and re-emphasizing the target again later can be beneficial.

Factors that Potentially Impacted Findings

Generalization across targets and internal validity. The data suggest that three of the students were able to generalize their learning to other targets. David and Amy were able to read both -*ap* and -*an* target words at criterion level before intervention for these targets began, and Evan was able to read -*an* target words to criterion level before intervention began for this target. David's reading of the -*ap* and -*an* target words and Evan's reading of the -*an* target words seem to directly follow their learning from the intervention for the -*at* target words, suggesting that the intervention for the previous target was influencing the other targets. Generalization across targets is likely to have occurred because from the beginning of instruction emphasis was placed on looking at every letter in a word and saying every sound. For example, it was evident during baseline assessment that Amy was not paying attention to the final sounds in a word though she was saying the first two sounds correctly. Amy knew all of the letters and the sounds they make. Thus once instruction and practice were given in looking at all of the letters in a word, including the final letter, she was able to transfer this learning to all similar targets.

The generalization across targets that was evident in this study reduces the internal validity of the experiment, as the learning for every target cannot be attributed to the intervention. It is therefore difficult to conclude that the intervention was effective for those targets for which generalization had occurred. However, generalizing learning from

one target to another occurred only between closely related targets. As would be expected, no generalization occurred with targets that were not related.

Despite the fact that generalization across targets reduces the internal validity of the study, from a teaching standpoint it highlights a desirable outcome of instruction. Information-processing theorists describe generalization as part of a child's development (Miller, 2002) and the value of generalization across targets as a skill is highlighted in a number of studies that have examined children's ability to generalize (e.g., Lovett, Borden, DeLuca, Lacerenza, Benson, & Brackstone, 1994; O'Connor, Jenkins, & Slocum, 1995). According to Lovett et al. (1994), "The attainment of transfer and documented generalization of training gains is necessarily the true test of efficacy for any intervention" (p. 820).

Instruction in the classroom. As the data were collected using students from other teachers' classrooms, it was difficult to control what was going on in those classrooms outside of the intervention for this study. To reduce the influence of classroom learning, targets were chosen that had already been covered by the classroom teachers approximately five months before data collection began. To maintain control in this study students were taught targets that were not being implemented in the classroom at the time, and conditions were kept the same during intervention and assessment.

Exposure to targets in authentic contexts. As the targets being taught in the small intervention groups were different from those being taught in the classroom, an issue of authenticity arises. In a natural context small group instruction would address the same targets being taught in whole class instruction. For reasons of control, this was not the case in this study. In this study it seems that a fairly high number of intervention sessions were

required to reach criterion level in Katy's case. The number of sessions required for Katy to reach criterion level was six for one of the targets and as her scores fell so dramatically with the removal of the intervention it is possible that more intervention sessions would have been beneficial. Six or more intervention sessions may seem like a lot in terms of resources, however, in an authentic environment where SEEL is being implemented at all tier levels, students are inundated with the targets in multiple settings during the same time period. For example, targets are highlighted and emphasized in whole class teaching contexts, centers, snack times, and transitions. During this study, students only received approximately 20 minutes instruction on each target four days per week. If a student was receiving intense exposure to the target several times throughout the day, it is possible that six Tier 3 intervention sessions would not be needed, and students would become proficient in each target much sooner. Furthermore, gaining this solid foundation in each target due to multiple exposures throughout the day could reduce the problem of falling scores during the maintenance period, which was a concern that was particularly evident for Katy in this study.

Recommendations for Further Research

As this study utilized a single subject design, with only four subjects, the results are not generalizable to other populations. These data need to be verified with repeated research using a similar design and different subjects. To be able to generalize results to other populations and attain external validity, the study must be repeated "to determine if an experimentally produced effect will occur another two, three, or more times" (Neuman & McCormick, 2000, p. 183).

In the current study, students were removed from their classroom for a small amount of time each day to participate in the intervention. As the targets being tested were different to those being taught within the classroom, this raises the question of authenticity. In a natural classroom setting students would be learning the same targets in several different contexts, for example, as a whole class, at centers, and for Tier 3 students in a tutoring situation. Additional research is needed to examine the effectiveness of Tier 3 SEEL instruction in an authentic environment in which the participants are exposed to SEEL instruction for the same target throughout the school day in a number of contexts as it is meant to be.

As well as examining the effectiveness of Tier 3 SEEL instruction in an authentic environment, it would also be interesting to examine the retention of learning as a result of this Tier 3 SEEL instruction. Evan experienced a slow decline in scores for the -*at* target during the maintenance phase, suggesting that even though competency in reading the targets words was reached during the intervention phase, this learning was not retained over time. It would therefore be interesting to examine students' scores over a longer period of time after the completion of the intervention. To determine whether learning was retained, students could be tested on their ability to read the same target words they learned during intervention a month after the intervention had ceased.

Conclusion

In conclusion, data from this study suggest that SEEL could be used as an effective intervention to teach Tier 3 students to learn to read CVC words. Patterns of generalization were evident and the data suggest that giving students time to practice and revisiting the

targets can be beneficial in their learning. The dilemma teachers face in addressing individual student's needs was highlighted in the study and needs further investigation.

References

Adams, M. (1990). *Beginning to read: Thinking and learning about print.* Cambridge, MA: MIT Press.

Archer, A. L., & Hughes, C. A. (2011). Exploring the foundations of explicit instruction. In K. R. Harris, & S. Graham (Eds.), *Explicit instruction: Effective and efficient teaching* (pp. 1-22). New York: Guilford.

Armbruster, B., Lehr, F., & Osborn, J. (2001). *Put reading first: The research building blocks for teaching children to read*. Jessup, MD: National Institute for Literacy.

Baer, D. M., Wolf, M. M., & Risley, T. R., (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1,* 91–97.

Ball, E. W. & Blachman, B. A. (1988). Phoneme segmentation training: Effect on Reading readiness. *Annals of Dyslexia, 38,* 208-225.

Ball, E. W., & Blachman, B. A. (1991). Does phoneme awareness training in Kindergarten make a difference in early word recognition and developmental Spelling? *Reading Research Quarterly, 26*, 49-66.

Berkeley, S., Bender, W. N., Peaster, L. G., & Saunders, L. (2009). Implementation of response to intervention: A snapshot of progress. *Journal of Disabilities, 42*, 85-95.

Bingham, G. E., Hall-Kenyon, K. M., & Culatta, B. (2010). Systematic and engaging early literacy: Examining the effects of paraeducator implemented early literacy instruction. *Communication Disorders Quarterly, 32,* 38-49.

Blachman, B. A. (l994). What we have learned from longitudinal studies of phonological processing and reading, and some unanswered questions: A response to Torgesen, Wagner, and Rashotte. *Journal of Learning Disabilities, 27,* 287-291.

Blachman, B. A. (2000). Phonological awareness. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 483–502). Mahwah, NJ: Erlbaum.

Bradley, L., & Bryant, P. E. (1983). Categorizing sounds and learning to read: A Causal connection. *Nature, 30,* 419-421.

Bryant, P.E., MacLean, M., Bradley, L.L., & Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology, 26*, 429-438.

Bryant, P., & Bradley, L. (1985). *Children's reading problems: Psychology and education.* New York, NY: Blackwell.

Burns, M. K., Deno, S., & Jimerson, S. R. (2007). Toward a unified model of Response to Intervention. In S. R. Jimerson, M. K. Burns, & A. M. VanDerHeyden (eds.), *The Handbook of Response to Intervention: The Science and Practice of Assessment and Intervention* (pp. 428-440). New York, NY: Springer.

Burns, M. K., Vanderwood, M. L., & Ruby, S. (2005). Evaluating the readiness of pre-referral intervention teams for use in a problem-solving model. *School Psychology Quarterly*, *20,* 89-105.

Burns, M. K., & VanDerHeyden, A. M. (2007). *The Handbook of Response to Intervention: The Science and Practice of Assessment and Intervention*. New York, NY: Springer.

Byrne, B., & Fielding-Barnsley, R. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology, 83,* 451-455.

Callender, W. A. (2007). The Idaho Results-Based Model: Implementing Response to Intervention statewide. In S. R. Jimerson, M. K. Burns, & A. M. VanDerHeyden (Eds.), *Handbook of Response to Intervention: The science and practice of assessment and intervention* (pp. 331-342). New York, NY: Springer.

Camilli, G., Vargas, S., & Yurecko, M. (2003). Teaching children to read: The fragile link between science and federal education policy. *Education Policy Analysis Archive, 11*(15).

Camilli, G., Wolfe, P. M., & Smith, M. L. (2006). Meta-analysis and reading policy: Perspectives on teaching children to read. *The Elementary School Journal, 107*, 27-36.

Camilli, G. C., Kim, S. H., & Vargas, S. (2008). A response to Steubing et al., "effects of systematic phonics instruction are practically significant": The origin of the National Reading Panel. *Education Policy Analysis Archive, 16*(16), 1-20.

Chall, J. S. (1983). *Stages of reading development.* New York, NY: Harcourt Brace.

Clay, M. M. (1985). *The Early Detection of Reading Difficulties* (3rd ed.). Portsmouth, NH: Heinemann Educational Books.

Coleman, M. R., Buysse, V., & Neitzel, J. (2006). *Recognition and response: An early intervening system for young children at-risk for learning disabilities.* Chapel Hill: The University of North Carolina at Chapel Hill, FPG Child Development Institute. Retrieved from http://www.ldonline.org/article/Recognition_and_Response%3A_An_Early_Intervening_System_for_Young_Children_At-Risk_for_Learning_Disabilities

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd Ed.). Upper Saddle River, NJ: Pearson.

Cornwall, A., & Bawden, H. (1992). Reading disabilities and aggression: A critical review. Journal of Learning Disabilities, 25(5), 281-288.

Culatta, B., Aslett, R., Fife, M., & Setzer, L. A. (2004). Project SEEL: Part I. Systematic and engaging early literacy instruction. *Communication Disorders Quarterly, 25,* 79-88.

Culatta, R., Culatta, B., Frost, M., & Buzzell, K. (2004). Project SEEL: Part II. Using technology to enhance early literacy instruction in Spanish. *Communication Disorders Quarterly, 25,* 89-96.

Culatta, B., Hall, K., Kovarsky, D., & Theadore, G. (2007). Contextualized approach to language and literacy (Project CALL): Capitalizing on varied activities and contexts to teach early literacy skills. *Communication Disorders Quarterly, 28,* 216-235.

Culatta, B., Reese, M., & Setzer, L. A. (2006). Early literacy instruction in a dual-language (Spanish-English) kindergarten. *Communication Disorders Quarterly, 27,* 67-82.

Culatta, B., Setzer, L. A., Wilson, C., & Aslett, R. (2004). Project SEEL: Children's engagement and progress attainments. *Communication Disorders Quarterly, 25*, 127-144.

Daly, E. J., III, Lentz Jr., F. E., & Boyer, J. (1996). The instructional hierarchy: A conceptual model for understanding the effective components of reading interventions. *School Psychology Quarterly, 11*, 369-386.

Ehri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. *Review of Educational Research, 71,* 393-447.

Ellis, E. S., & Worthington, L. A. (1994). *Research synthesis on effective teaching principles and the design of quality tools for education.* (Tech. Rep. No. 5). Eugene, OR: University of Oregon, National Center to Improve the Tools for Educators.

Fielding, L., Kerr, N., & Rosier, P. (1998). *The 90% reading goal.* Kennewick, WA: National Reading Foundation.

Fletcher, J. M., & Foorman, B. R. (1994). Issues in definition and measurement of learning disabilities. In G. R. Lyon, D. B. Gray, J. F Kavanagh, & A. Krasnegor (Eds.), *Better understanding learning disabilities: New views from research and their implications for education and public policies* (pp. 185-200). Baltimore, MD: Paul H. Brookes.

Francis, D.J., Shaywitz, S.E., Stuebing, K.K., Shaywitz, B.A., & Fletcher, J.M. (1996). Developmental lag versus deficit models of reading disability: A longitudinal, individual growth curves analysis. *Journal of Educational Psychology, 88,* 3-17.

Fuchs, D., Fuchs, L. S., & Vaughn, S. (2008). *Response to intervention: A framework for reading educators.* Newark, DE: International Reading Association.

Good, R. H., III, Kaminski, R. A., Simmons, D., & Kame'enui, E. J. (2001). Using Dynamic Indicators of Basic Early Literacy Skills (DIBELS) in an Outcomes-Driven Model: Steps to Reading Outcomes. Oregon School Study Council Bulletin, 44(*1*), 1-28.

Graner, P. S., Faggella-Luby, M. N., Fritschmann, N. S. (2005). An overview of responsiveness to intervention: What practitioners ought to know. *Topics in Language Disorders, 25,* 93-105.

Graue, E. (2009). Reimagining Kindergarten, *School Administrator 66*(10), 10-15.

Harris, T. L., & Hodges, R. E. 1995. *The literacy dictionary: The vocabulary of reading and writing.* Newark, DE: International Reading Association.

Hiebert, E.H., & Martin, L.A. (2001). The texts of beginning reading instruction. In S. Neuman & D. Dickinson (Eds.), *Handbook of research on early literacy* (pp. 361-376). New York, NY: Guilford.

Hoover, J. J., Baca, L., Wexler-Love, E., & Saenz, L. (2008). *National implementation of response to intervention.* Alexandria, VA: National Association of State Directors of Special Education. Retrieved from www.nasdse.org/Portals/0/National ImplementationofRTI-ResearchSummary.pdf

International Reading Association (2010). *Response to intervention: Guiding principles for teachers*. Newark, DE: International Reading Association.

Iverson, J. A., & Tunmer, W. E. (1993). Phonological processing skills and the Reading Recovery program. *Journal of Educational Psychology, 85*, 112–125.

Jimerson, S. R., Burns, M. K., VanDerHeyden, A. M. (2007). *Handbook of Response to Intervention*. New York, NY: Springer.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology, 80*, 443–447.

Kennedy, C. H. (2006). *Single-case designs for educational research*. Boston, MA: Allyn & Bacon.

Learning Point Associates (2004). *A closer look at the five essential components of effective reading instruction: A review of scientifically based reading research for teachers.* Retrieved from http://www.learningpt.org/pdfs/literacy /components.pdf

Lonigan, C. J., Burgess, S. R., & Anthony, J. L. (2000). Development of emergent literacy and early reading skills in preschool children: Evidence from a latent variable longitudinal study. *Developmental Psychology, 36,* 596-613.

Lovett, M. W., Borden, S. L., DeLuca, T., Lacerenza, L., Benson, N. J., & Brackstone, D. (1994). Treating the core deficits of developmental dyslexia: Evidence of transfer of learning after phonologically- and strategy-based reading training programs. *Developmental Psychology, 30*, 805-822.

Lundberg, I., Frost, J., and Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly, 23,* 264-284.

Macdonald, C., & Figuereda, L. (2010). Closing the gap early: Implementing a literacy intervention for at-risk kindergartners in urban schools. *The Reading Teacher, 63,* 404-419.

McFadden, T. (1998). Sounds and stories: Teaching phonemic awareness in interactions around text. *American Journal of Speech Language Pathology, 7,* 5–13.

McGee, L. M., & Richgels, D. J. (2008). *Literacy's beginnings: Supporting young readers and writers (5th ed.)*. Boston, MA: Allyn & Bacon.

Macmillan McGraw-Hill (2007). Treasures, a Reading/Language Arts Program. Retrieved from http://treasures.macmillanmh.com/national

Miller, P. H. (2002). Theories of Developmental Psychology (5th ed.). New York, NY: Worth Publishers

National Reading Panel (2000). *Report of the National Reading Panel: Reports of the subgroups.* Washington, DC: National Institute of Child Health and Human Development Clearinghouse.

Nelson, J. R., Benner, G. J., & Gonzalez, J. (2005). An investigation of the effects of a prereading intervention on the early literacy skills of children at risk of emotional disturbance and reading problems. *Journal of Emotional and Behavioral Disorders, 13,* 3–12.

Nelson, J. R., Benner, G. J., Lane, K., & Smith, B. W. (2004). An investigation of the academic achievement of K-12 students with emotional and behavioral disorders in public school settings. *Exceptional Children, 71*, 59-74.

Nelson, J. R., Stage, S. A., Epstein, M. H., & Pierce, C. D. (2005). Effects of a prereading intervention on the literacy and social skills of children. *Exceptional Children, 72,* 29–45.

Nes Ferrara, S. L. (2005). Reading fluency and self-efficacy: A case study. *International Journal of Disability, Development & Education*, *52,* 215-231.

Neuman, S. B., & McCormick, S. (2000). A case for single-subject experiments in literacy research. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, R. Barr (Eds.), *Handbook of Reading Research: Vol. 3* (pp. 181-194). Mahwah, NJ: Lawrence Erlbaum

Nunn, G. D. (2005). *Evaluation summary report: results-based model SI final summary of evaluation findings 1999-2004.* Boise, ID: Idaho State Department of Education.

O'Conner, R. E., Harty, K. R., & Fulmer, D. (2005). Tiers of intervention in kindergarten through third grade. *Journal of Learning Disabilities, 38*, 532-538.

O'Connor, R. E., Jenkins, J. R., & Slocum, T. A. (1995). Transform among phonological tasks in kindergarten: Essential instructional content. Journal of Educational Psychology, 87, 202-217.

Olive, M. L. & Smith, B. W. (2005). Effect size calculations and single subject designs. *Educational Psychology, 25*, 313-324.

Phillips, B. M., Clancy-Menchetti, J., & Lonigan, C. J. (2008). Successful phonological awareness instruction with preschool children: Lessons from the classroom. *Topics in Early Childhood Special Education, 28,* 3-17.

Pinnell, G. S. (1989). Reading Recovery: Helping at-risk children learn to read. *The Elementary School Journal*, *90,* 159-181.

President's Commission on Excellence in Special Education. (2002, July). A new era: Revitalizing special education for children and their families. Washington, DC: U.S. Department of Education Office of Special Education and Rehabilitative Services. Retrieved from http://www.ed.gov/inits/commissionsboards/whspecialeducation/reports/index.html

Rack, J. P., Snowling, M. J., & Olson, R. K. (1992). The nonword reading deficit in developmental dyslexia: A review. *Reading Research Quarterly, 27,* 28-53.

Reutzel, D. R. (1997). Integrating literacy learning for young children: A balanced literacy perspective. In C. H. Hart, D. C. Burts, & R. Charlesworth (Eds.), *Integrated curriculum and developmentally appropriate practice* (pp. 225-256). Albany, NY: State University of New York Press.

Ritchey, K. D., & Speece, D. L. (2004). From letter names to word reading: The nascent role of sublexical fluency. *Contemporary Educational Psychology, 31,* 301-327.

Rosen, M., Oxenbury, H. (1989). *We're Going on a Bear Hunt.* New York, NY: Margaret K. McElderry Books.

Savage, R. E., Frederickson, N., Goodwin, R., Patni, U., Smith, N., & Tuersley, L. (2005). Relationships among rapid digit naming, phonological processing, motor automaticity, and speech perception in poor, average, and good readers and spellers. *Journal of Learning Disabilities, 38,* 12-28.

Scanlon, D. M., & Vellutino, F. R. (1997). A comparison of the instructional backgrounds and cognitive profiles of poor, average, and good readers who were initially identified as at risk for reading failure. *Scientific Studies of Reading 1*, 191-215.

Scanlon, D. M., & Vellutino, F. R. (1996). Prerequisite skills, early instruction, and success in first grade reading: Selected results from a longitudinal study. *Mental Retardation and Development Disabilities, 2,* 54-63.

Scanlon, D. M., Vellutino, F. R., Small, S. G., Fanuele, D. P., & Sweeney, J. M. (2005). Severe reading difficulties—Can they be prevented? A comparison of prevention and intervention approaches. *Exceptionality, 13*, 209-227.

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. Neuman & D. Dickinson (Eds.), *Handbook for Research in Early Literacy* (pp. 97-110). New York, NY: Guilford.

Scarborough, H. S. (1998). Early identification of children at risk for reading disabilities: Phonological awareness and some other promising predictors. In B. K. Shapiro, P. J. Accardo, & A. J. Capute (Eds.), *Specific reading disability: A view of the spectrum* (pp. 75-119). Timonium, MD: York Press.

Stahl, S.A., Duffy-Hester, A.M., & Stahl, K.A.D. (1998). Everything you wanted to know about phonics (but were afraid to ask). *Reading Research Quarterly, 33,* 338-355.

Stahl, S. A., & Murray, B. A. (1994). Defining phonological awareness and its relationship to early reading. *Journal of Educational Psychology, 86,* 221-234.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly, 21,* 360-406.

Thistlethwaite, D. L., & Campbell, D. T. (1960). Regression-discontinuity analysis: An alternative to the ex post facto experiment. *Journal of Educational Psychology, 51,* 309-317.

U.S. Department of Education (2001). *No Child Left Behind*. Retrieved from http://www2.ed.gov/policy/elsec/leg/esea02/index.html

Vellutino, F. R., Scanlon, D. M., Sipay, E. R., Small, S. G., Pratt, A., Chen, R. S., & Denckla, M. B. (1996). Cognitive profiles of difficult to remediate and readily remediated poor readers: Early intervention as a vehicle for distinguishing between cognitive and experiential deficits as basic causes of specific reading disability. *Journal of Educational Psychology, 88,* 601-638.

Vellutino, F. R., Scanlon, D. M., Small, S., & Fanuele, D. P. (2006). Response to Intervention as a vehicle for distinguishing between children with and without reading disabilities: Evidence for the role of kindergarten and first-grade interventions. *Journal of Learning Disabilities, 39,* 157-169.

Wagner, R. K., & Torgesen, J. K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. *Psychological Bulletin, 101,* 192-212.

Wasik, B. A., & Slavin, R. E. (1993). Preventing early reading failure with one-to-one tutoring: A review of five programs. *Reading Research Quarterly, 28,* 179-200.

What Works Clearinghouse (2007). *Stepping Stones to Literacy*. Retrieved from http://www.eric.ed.gov:80/PDFS/ED497726.pdf

Wright, P. W. D., & Wright, P. D. (2007). *Wrightslaw: Special Education Law* (2nd ed.). Hartfield, VA: Harbor House Law Press.

Appendix A

Kindergarten Literacy Assessment

What are the names of these letters?

a	f	k	p	w	z
b	h	o	j	u	
c	y	l	q	m	
d	n	s	x	i	
e	g	r	v	t	

What sound do these letters make?

a	f	k	p	w	z
b	h	o	j	u	
c	y	l	q	m	
d	n	s	x	i	
e	g	r	v	t	

Rhyming

Do you know what a rhyme is? Rhymes are words that sound the same at the end, for example, cat and hat rhyme because they both end with –at. Pin and tin rhyme because they both sound the same at the end. They both end with –in. Run and green don't rhyme. Run ends with –un and green ends with –een.

Tell me if these words rhyme:

1. sun/blue	6. dollar/penny
2. talk/walk	7. top/cake
3. blue/shoe	8. house/mouse
4. tree/flower	9. fish/wish
5. dive/five	10. dog/hat

Can you tell me a word that rhymes with:

1. cat
2. pen
3. back
4. hop
5. lit

Blending (based on Rosell-Chall-Auditory Blending Test)
Tell me what word we would have if these sounds were put together. We'll practice a few first." S—ing. What word does it make? If the child answers correctly, continue with the final two practice words. If the child answers incorrectly, say s—ing says sing. Now you try it." Repeat the first practice word as before. Wait for child to answer. If correct, continue with final two practice words. If incorrect, provide child with correct answer and continue with practice words.

1. a-t	6. r-an
2. m-y	7. c-a-t
3. b-e	8. b-i-g
4. f-at	9. g-o-t
5. b-ed	10. d-e-sk

Segmenting (based on Yopp-Singer Test of Phoneme Segmentation)
Now we're going to play a word game. I'm going to say a word and I want you to break the word apart. You are going to tell me each sound in the word in order. For example, if I say "bat," you should say b-a-t. lets practice a few.
ride go man

1. dog	6. wave
2. man	7. hop
3. fine	8. sit
4. no	9. red
5. she	10. pat

Appendix B

Biographical Information

Questions for Teachers:

1. How does ____ do in school academically?
2. How does ____ do in school socially?
3. What are ____'s strengths as a student?
4. What are ____'s weaknesses as a student?
5. Do you think ____ enjoys coming to school? Why or why not?
6. How has _____'s progress been this year?
7. Is there anything else you think it would be good for me to know about _____?

Questions for Parents:

1. When is _____'s birthday (including year)?
2. What is _____'s racial heritage?
3. What language(s) do you speak in the home?
4. How does _____ do socially?
5. Do you think _____ likes school? Why or why not?
6. What kind of things does _____ like to do outside of school?
7. Tell me a little bit about your family:
   a. Number of people in the family living in the home? _____
      i.) Sibling ages: _____

   b. How much reading does _____ do at home? _____ With whom? _____
8. Is there anything else you think it would be good for me to know about _____?

Appendix C

SEEL Treatment Fidelity Check Sheet

Meaningful		Yes/No
a.	Was the activity appropriate for kindergarten age children?	
b.	Did the instructor link the activity to students' prior knowledge and experience?	
c.	If necessary did the instructor illustrate the meaning of target words to students?	

Explicit		Yes/No
a.	Did the instructor explicitly state the target at the beginning of the lesson?	
b.	Did the instructor restate the target throughout the activity?	
c.	Did the instructor model the target and the activity for students?	

Playful and Engaging

a. Was the instructor playful with the students?

None of the time	Some of the time	Most of the time	All of the time

b. Did the instructor encourage the students to be playful?

None of the time	Some of the time	Most of the time	All of the time

c. Were the students actively involved?

None of the time	Some of the time	Most of the time	All of the time

d. Did the students appear to enjoy the activity?

None of the time	Some of the time	Most of the time	All of the time

e. Did students appear to be engaged in the activity?

None of the time	Some of the time	Most of the time	All of the time

Intense exposure to targets

How many times did you hear the instructor use the target words and sounds in each 30 seconds of the activity?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Were students given opportunities to use the target words and sounds, e.g, through conversation, songs, chants, reading, and writing? _____

Reciprocal exchanges

a. Did the instructor listen to the students and respond to their actions and comments?

None of the time	Some of the time	Most of the time	All of the time

b. How many times did you see this occur? _____

Appendix D

Assessment Check Sheet

I'm going to ask you to try to read some words. I may not have taught you to read all of the words yet, so if you don't know how to read a word that's okay, just say, "I don't know" and move onto the next word by pressing this button. When you're done you'll get a prize, even if you don't know the words. Now do your best reading.

Date:

Name:

-an words	
fan	
man	
pan	
ran	
tan	
van	
-ap words	
cap	
gap	
lap	
map	
rap	
tap	
-at words	
bat	
cat	
fat	
hat	
mat	
sat	

Name:

-an words	
fan	
man	
pan	
ran	
tan	
van	
-ap words	
cap	
gap	
lap	
map	
rap	
tap	
-at words	
bat	
cat	
fat	
hat	
mat	
sat	

Sh Assessment Check Sheet

I'm going to ask you to try to read some words. I may not have taught you to read all of the words yet, so if you don't know how to read a word that's okay, just say, "I don't know" and move onto the next word by pressing this button. When you're done you'll get a prize, even if you don't know the words. Now do your best reading.

Date:

Name:

sh words	
shack	
shin	
ship	
shop	
shot	
shut	
ch words	
chat	
chick	
chin	
chip	
chop	
chug	
-e- words	
bled	
fred	
sled	
sped	
stem	
step	

Name:

sh words	
shack	
shin	
ship	
shop	
shot	
shut	
ch words	
chat	
chick	
chin	
chip	
chop	
chug	
-e- words	
bled	
fred	
sled	
sped	
stem	
step	