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Exploring the Effects of Using the *Words Their Way*TM Program with Teenage Boys with Autism

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Abstract

This project is an initial investigation into effective methods of literacy instruction for teenage boys with autism. This study specifically focused on the *Words Their Way*TM Program incorporating Word Study for Spelling Instruction. The program focuses on developmental levels, differentiated based on ability, and uses a variety of multi-modal activities. Through a mixed-methods approach, both qualitative and quantitative data is collected and significant themes are developed (improvement in handwriting, characteristics of autism becoming academic obstacles, issues with the program, and ways motivation and engagement have influenced student performance). It was concluded that the program does improve spelling ability though its relevance with the population varies based on severity of disability. The program requires modification for special education, as each student's learning needs differ.

Keywords: literacy, autism, teenage, males, special education, Words Their Way, spelling

Chapter 1: Introduction

As the clock nears 9:30 am, I can see the tension grow on Josh's (pseudonym) face. It evolves from happy and compliant to glazed over and frustrated. This transformation is inevitable, as it is time for literacy to begin, something Josh detests. As I prompt him to take his seat, his eyes do a full circle, returning to place in a glare.

Excitedly I say, "Alright Josh, today you and I are going to hunt for treasure around the school! I have hung up super secret coins I want you to find. Once you find them all we can deliver them to Pirate Brent (Physical Education Teacher) for a prize!"

Josh seems somewhat intrigued, as he loves anything involving pirates, treasures, and Brent. "Alright" he says, somewhat questioning my motives.

As we race through the school, he finds the first coin and realizes a sight word is on it. Immediately he begins yelling, "You lied to me, this isn't a game. This is stupid. I'm not doing it!" He throws the "treasure chest" at me and rips the coin into pieces while stomping back to the classroom.

Josh stops short of the classroom door, folds his arms and glares at me with tears in his eyes. "You know I hate reading. Why would you trick me?" he asks. I enter into a conversation with him about how I am trying to help him. I explain, "It was a game with a small twist!" Like most days, after about ten minutes, Josh calms down and agrees to finish the task.

Josh is an 11-year-old boy with autism in my self-contained special education classroom. Josh is a smart boy who excels in mathematics but despises anything involving literacy. He is able to read at a kindergarten level and can recognize about 120 sight words. Throughout the past few months, I have attempted to create hands-on and interactive activities such as letter searches, word searches around the school, sensory-based activities, and activities with lower leveled peers

to build his confidence. These types of activities would engage him for about one minute, then he would become angry and destroy the activity. I attempted to vary the difficulty, hoping if a task were less challenging it would increase confidence, or if it were more challenging, it would engage him. All attempts were to no avail. Regardless of my efforts at motivating and engaging Josh in literacy, it typically resulted in frustration and anger. Through consistent refusal, Josh's academic progress has significantly declined, forgetting even the easiest of concepts.

As I wrote Josh's progress report, I was at a loss for words. How could I incorporate all I had attempted and how it had all failed to help him? That was when I decided to completely wipe the slate clean and start from scratch. There had to be something out there that would engage Josh, teach basic literacy concepts, and show consistent progress. I looked around and confided in colleagues. After a great deal of research, a classmate suggested the *Words Their Way™* program, something she used in her general education classroom. Enthusiastic about the program, she informed me of all the advantages and progress her students made. I liked how differentiation and individualized instruction seemed plausible, perfect for my diverse special education classroom.

I borrowed the books and materials and began to delve into the *Words Their Way™* program. As I began piloting the program with Josh, I could see immediate improvements in his phonological awareness and willingness to complete tasks. Asking him what changed, he would say, "I like the games, they're easy." Little did he know, he was learning at his ability level. As he continued with the program, his self-confidence grew significantly. It was as if all the holes were filled and the foundation was strong enough to foster independently driven learning! I was sold; I used it with my entire class as a supplement to their regular literacy instruction.

This school year, I changed classrooms and had an entirely new group of students. My only concern about using the program was that the boys in this class were much older. As I researched various teaching methods and strategies to teach teenage boys with autism, I came up fairly empty handed. Little addressed my specific classroom population. I decided to conduct my own research, uncovering the effects of using the *Words Their Way*TM program with my new group of teenage boys with autism.

Throughout the past ten years, the prevalence of autism has increased (Baio, 2014). Now students with autism make up a significant percentage of the population in the United States, an even higher percentage of them are males (Baio). Legislation throughout the past decade has altered the educational platform, requiring students with autism to be included in general education settings (Martin, 2009). In addition, the Common Core Standards have increased the academic rigor expected of students, specifically in literacy (*Preparing America's Students for Success*, 2014).

Classrooms across the country are seeing an increase in the population of students with disabilities, and expected to preform to a raised academic bar regardless. Teachers are scrambling to find resources to meet this expectation, but often in vain. Additionally, boys are much more difficult to motivate to participate in and enjoy literacy, and much more difficult with boys with autism (“Me Read? No Way!” 2004). When teachers search for resources, they come up empty handed, as little exists in regards to boys with autism and literacy engagement.

The purpose of this study was to determine if the *Words Their Way*TM program, created by Bear, Invernizzi, Johnston, and Templeton (2012), is an effective way to teach spelling skills to teenage boys with autism. Throughout this study, I further addressed current issues in Special Education and holes in the research. In addition, I review the current literature surrounding

autism, spelling, and the *Words Their Way*TM program. In Chapter three, I discuss the methods and procedures used to determine the effectiveness of the program's use in my classroom. I then analyze the data collected and draw conclusions, make implications for further research, and recommendations for use.

Importance and relevance

This project was an initial investigation into effective methods of literacy instruction for teenage boys with autism. This study specifically focused on the *Words Their Way*TM Program incorporating Word Study for Spelling Instruction. This study is of importance because educational legislation passed throughout the 20th and 21st centuries requires schools to raise the bar for student achievement.

Throughout the past 20 years, various laws resulted in an increased presence of students with disabilities in general education settings. According to Martin (2009), in 2002 the No Child Left Behind Act (NCLB) emerged as a reauthorization of the Elementary and Secondary Education Act. The NCLB Act intended to close the achievement gap between advantaged and disadvantaged students throughout the United States. Soon after, the reauthorization of the Individuals with Disabilities Education Act (IDEA) took place in 2004 and closely mirrored the objectives of NCLB. Together, these two pieces of legislation created monumental changes in the educational system of the United States. Both Acts called for an increase in academic standards, measurement of academic progress, and allocation of federal funds based on accountability requirements regardless of student disability limitations. Due to these changes, students with disabilities were placed in less restrictive environments (Martin), typically being inclusive classrooms in public schools. According to Martin, throughout the past decade, United States public schools have seen a 30% increase in the Special Education population.

According to “Preparing America's Students for Success” (2014), in 2009, state leaders from 48 states introduced the Common Core Standards Initiative. Before the Common Core Initiative, each state had its own set of standards, focusing on a variety of information it deemed important for student success. The intention of the Common Core Standards was to make the country’s standards cohesive and effectively prepare our students for college and career readiness. One of the major shifts includes a strong focus on literacy throughout all subject areas. Based on the Common Core State Standards, literacy is an essential component in preparing students for the future, across all content areas. In order to effectively prepare our students for the type of academic rigor required by the Common Core, we, as teachers need to increase our literacy knowledge and continue to learn, as changes occur on a daily basis.

Problem statement

Due to the increased academic rigor, additional support and resources for teachers are necessary to accommodate all learners and maintain the high standards the legislation mandates. The increase of students with disabilities within general education classrooms requires an increase in resources and support to ensure success of all students. Students with disabilities require accommodations and modifications to typical general education instruction. In order to cater to the needs of all students, an effective and efficient program for teachers to use must be in place. Based on the current research, no such program exists. Granted, no two children are alike and it is not possible to help each student in the same way. Nevertheless, efforts should be made to find a helpful program for teachers.

Significance of the problem

According to The United States Department of Education (2012), of all students enrolled in schools in the United States, 13 percent have a disability, and of the fourteen types of

disabilities defined, students with autism make up .8 percent of them. The prevalence of Autism Spectrum Disorder (ASD) continues to increase throughout the United States each year. Since the late 1960s when the earliest studies of ASD were conducted, there has been a 20-30 percent global increase. According to Baio (2014), within the last ten years alone, autism's overall prevalence has increased from one in 125 in 2004 to one in sixty-eight in 2010. In 2010, 419,262 children between the ages of three and twenty-one received services under the ASD classification for special education services. Of those students, males are four to five times more likely to have an autism diagnosis than females.

According to the "2013 National Assessment of Education Progress", only 38 percent of students in the United States were at or above the proficient level in literacy. Literacy is an essential skill for success, yet only a small percentage of our students are proficient at it. As stated previously, the Common Core State Standards shifted their focus towards literacy in an effort to ensure college and career readiness for our students; however, research is necessary in order to find effective methods of delivering instruction. Moats (2005) states, "research that directly compares or validates specific instructional methods is minimal" (p. 22). Teachers have the task of raising proficiency levels, but have access to few resources to do so, let alone ones incorporating students with autism.

A great deal of research pertaining to students with autism and the teaching methods that work best for them is readily available for teachers. However, little research exists regarding teenage boys with autism. According to "Me Read? No Way!" (2004), boys' test scores across all grade levels show significant deficits in literacy abilities in comparison to their female counterparts. While a great deal of literature suggests how to engage and motivate boys, little includes boys with autism. Due to the lack of literature, teachers have little to utilize with a large

portion of their student population. This study intends to address this topic and shed light on what helps boys with autism acquire language skills, specifically word study for spelling. The creation of the *Words Their Way™* program was to specifically aid in developmental spelling instruction. The program caters to grades K-12 using hands-on exploration of word study. The program's organization makes it a potentially valuable tool for teachers looking to differentiate instruction in a class of diverse learners.

Due to the significant influx of students with ASD, it has become essential that constant and current research occur, ensuring students receive the best education. In this study, I investigated the effects of using *Words Their Way™* as a form of literacy instruction for teenage boys with autism, as it could provide vital information for teachers across the United States. The information gathered can provide insight into the thought processes and learning needs of a growing population of students, specifically males. The purpose of this study was to equip teachers with essential strategies in literacy for students with autism. This study allowed me to explore the world of moderate to severe autism and what could work for these students in regards to literacy instruction.

Background/Rationale

Being a teacher in a private Special Education school, I have seen a plethora of approaches to literacy instruction. Many of these approaches are disjointed and lack evidence based practices ensuring student success. The reason such fragments exist is because teachers are attempting to differentiate for students at vastly different levels of cognitive ability. Having worked with this population, it is clear to see one size does not fit all, not even remotely. Typically, teachers use trial and error with a variety of programs to instruct students. Unfortunately, this method ends up confusing both the student and teacher. I have been looking

for an organized program, developmental in progression, and differentiated for a diverse population. I found the *Words Their Way*TM program and it fit all of my criteria. Through this study, I delved deeper into the program, trialing it with my students, determining the effects, both positive and negative that surfaced.

Approach/Conceptual Framework

For this study, I used a mixed methods design, using components of both qualitative and quantitative research. According to Clark & Creswell (2010), I used the single subject research design, looking at behaviors, motivation, and engagement of a small sample of students. The study focused on what worked best for each individual. Additionally, I used the survey research design, asking participants about preferences in instructional strategies to gauge what motivated and engaged them.

Chapter 2: Literature Review

Autism Spectrum Disorder presents itself with a wide variety of characteristics. To effectively instruct students with autism, teachers must understand these characteristics and adapt instruction based on individual needs. As addressed in the previous chapter, literacy is an essential component of education; therefore, research is necessary in order to understand literacy and spelling acquisition and how it can be adapted for students with autism. This section will explore autism, the ways students with autism learn, spelling instruction, and the *Words Their Way*TM program.

Autism Spectrum Disorder

A brief history of autism. In 1943, seminal researcher and psychologist Leo Kanner described a group of eleven children as having the following characteristics: unable to relate typically to others, have delays in speech and language development, extremely literal, typical

physical growth and development, obsessed with consistency in their environment, have extreme fascinations with certain objects or ideas, and have stereotypic behaviors. Throughout the past seventy years, as research expanded and legislation changed, many addendums to the broad description of autism occurred. According to Friend (2011), in 1980, the “American Psychiatric Association added autism to the Diagnostic and Statistical Manual of Mental Disorders (DSM). In 1990, autism was added to the Individuals with Disabilities Educational Act as a distinct category of disability (p. 299).”

The cause of autism. Debate has transpired concerning the cause of autism since Kanner began his study in 1943. Kanner considered the cause of autism to be “refrigerator mothers” (Friend, 2011, p. 298) who were detached and non-nurturing. According to the National Institute of Neurological Disorders and Stroke (2009), autism may be due to genetic differences or other malfunctions such as an enlarged cerebellum, frontal and temporal lobes. Williams (2008) found people with autism typically have fewer brain cells, higher brain cell density or less volume than an average individual. Environmental factors can contribute to autism and its severity as well. According to Friend, in order to reduce typical behavior problems, children with autism should grow up in a positive and structured environment. There has been a great deal of controversy over the correlation between the measles, mumps, and rubella (MMR) immunization and autism. According to the Center for Disease Control (2004) and Prevention, there has not been establishment of a causal link. Studies centered on identifying causes for autism continue, as a specific cause is still unknown and cannot be isolated.

Characteristics of autism. Students with autism present a variety of different characteristics cognitively, academically, socially, emotionally, and behaviorally. Because of the

variety of characteristics presented, there should be differentiation of academic instruction to meet their individual needs.

Cognitive and academic characteristics. According to Friend (2011), individuals with autism “often have irregular patterns of cognitive and educational strengths and deficits, with the majority of individuals with autism disorder having some level of intellectual disability and those with Asperger syndrome having average to above average ability” (p. 305). One way autism presents itself is with rote memory, where individuals have a great ability to memorize things with no understanding of their meanings. According to Gabig (2008), because of this ability, they often seem as though they understand concepts when they truly do not. While individuals with autism have such an exceptional ability to memorize facts, Friend explains they often find it difficult to retrieve these facts. If the phrasing of directions is specific, this can prompt retrieval. The theory of mind is another deficit individuals with autism typically have. According to Myles & Southwick (2005), these individuals “have difficulty explaining their own behaviors, predicting others’ emotions or behaviors, comprehending others’ perspectives, understanding how behavior affects others’ thought and feelings, participating in conversations, and distinguishing fact from fiction” (as cited in Friend, 2011, p. 306). Individuals with autism have difficulty problem solving. According to Friend, most individuals with autism only have a single problem solving strategy they know and use consistently, whether or not it is successful. The inability to problem solve is possibly due to individuals with ASD’s inability to recall information and is often heightened during interpersonal interactions and when dealing with abstract concepts. Academically, an issue many teachers find difficult to work with is levels of motivation. Typically, specific activities or rewards motivate individuals with autism and can change completely from time to time. The uncertainty of motivation makes it difficult to instruct,

as individuals with autism can easily lose interest when the information presented is not in an engaging format. Individuals with autism have issues with generalization of information, making it difficult for them to transfer information from one setting, individual or condition to another. Teachers often see generalization issues present themselves when transitioning from classroom to classroom or subject to subject.

Social and emotional characteristics. The social and emotional characteristics individuals with autism encounter intertwine with their various other special needs. A great deal of social and emotional characteristics of individuals with autism center around language and how others perceive individuals with autism's use of language. Individuals with autism find it difficult to understand abstract ideas such as metaphors, rhetorical questions, idioms, allegories, and parables, making it difficult for them to engage in conversation with others (Friend, 2011). According to Friend, many individuals with autism have difficulty with language development and may fail to use language to communicate or do not desire to. Many individuals with autism often struggle with proxemics (socially acceptable distance to stand from someone), staring intensely during conversation or not being able to make eye contact. Individuals with autism lack the ability to interpret gestures and facial expressions. Some individuals with autism engage in echolalia as well, or the repetition of utterances made by another during conversation. Many individuals have prosody problems, meaning they use a monotone or singsong voice during conversation. While each characteristic on its own seems manageable, many individuals with autism have a combination of them, making it difficult to socialize with peers. Others often perceive individuals with autism as immature due to the frustration and anger developing from their inability to interpret social cues and communicate effectively.

Behavioral characteristics. According to Friend (2011), individuals with autism often present many self-stimulatory behaviors such as head banging, hand flapping, and rocking. In my personal experiences, this type of stereotypical behavior helps calm them or alter stimulation from their current environment. Individuals with autism face a great deal of sensory issues, as it is one of the most common characteristics to present itself. Friend states individuals with autism have processing issues with the “tactile (touch), vestibular (balance), proprioception (body awareness), visual (sight), auditory (hearing), gustatory (taste), and olfactory (smell)” systems (p. 309-310). When individuals with autism become over stimulated by one of these systems or have the inability to understand/access them correctly, it often leads to maladaptive behaviors being perceived as socially unacceptable.

Effective Educational Strategies. Students learn in a variety of different ways, making it the teacher’s responsibility to identify learning styles and use them effectively. According to Friend (2011), students with autism learn best through visual supports which present information in pictures or labels, often used for schedules or to broaden environmental vocabulary. Priming is another strategy used to allow additional processing of information in order to reduce anxiety. Teachers will present information or materials to the student before the lesson’s implementation so the student can see and understand the content beforehand. Another strategy used to reduce anxiety is “home base” or a safe place for students to go when they feel especially nervous about something. Prompting, both verbal and visual, is another strategy commonly utilized. Prompts help to regain attention to a task, alert students of time restraints, transition students or prepare them for a change. In addition to these strategies, highly effective strategies I implement include reduction of distractions, sensory breaks, walks, weighted blankets, exercise balls, dividers to reduce stimulation by peers, assistive technology, modeling, and scaffolding. Each student is

extremely different in the ways his or her autism presents itself, as well as how he or she learns. A great deal of time is spent trialing different strategies to regulate students' sensory issues and frustration levels when they encounter difficult academic tasks. A plethora of evidence-based practices for students with disabilities exist; methods specific to spelling acquisition are addressed later in this chapter. According to Lyons (2003), students with autism learn best with a safe, quiet, encouraging environment with limited distractions that has structure and a routine. Students learn best by having attainable goals and being aware of time limits. They require cues, verbal, gestural or physical to remain on task or to transition. Typically, students with autism learn concepts best through systematic instruction, repetition, and modeling.

Spelling

As defined by Sayeski (2014), “spelling is the application of phonemic awareness and alphabetic knowledge to letters in an accepted orthographic or writing system” (p. 76-77). Bear and Templeton (1998) add, “the three layers of information that spelling represent [are] alphabetic, pattern, and meaning” (p. 224). Beirne-Smith and Riley (2009) state, “accurate spelling is a complex act that requires cognitive and linguistic knowledge of the phonological, morphological, syntactical, and semantic principles of our language” (p. 170). Loeffler (2005) states accurate spelling requires an ability to understand visual cues, word patterns, high-frequency words, and phonics.

The Necessity for Spelling Instruction. There has been some debate over the role spelling plays in literacy, as well as the importance of teaching it in isolation within the classroom. As stated in the previous paragraph, spelling is complex and requires a great deal of knowledge and skill to master. Bear et al. (2012) suggest literacy is a braid, interwoven with orthography, reading, oral language, stories, and writing. From an early age, children begin

experiencing components of literacy, thereby developing a comprehensive understanding of literacy. Initially, children experience stories and oral language. As they grow, students begin “writing” through scribbling and observing adults writing proficiently to convey information. As children further develop, they understand the correspondence between spoken language, written language, and words carrying meaning. Through life experiences, children’s understanding of literacy gradually broadens, as it is enhanced through explicit instruction in school. Bear et al. insist teachers address all areas of literacy in the classroom, as they intertwine with one another and development in all areas is essential for proficiency.

In 2000, the National Reading Panel (NRP) considered phonological awareness, phonics, fluency, vocabulary, and comprehension to be the five essential components of a reading lesson (Moats, 2005). Many assumed through reading instruction, spelling skills would develop. Mehta, Foorman, Branum-Martin, and Taylor (2005) investigated the extent the five “essential components” outlined by the NPR were related or independent of one another. They found students who were better at spelling showed proficiency in reading and vice versa, but on average, children tended to excel in reading much more frequently than in spelling. Throughout this longitudinal study, Mehta et al. discovered without explicit spelling instruction, spelling abilities declined as students progressed.

Louisa Moats (2005), a seminal researcher of spelling development and instruction, states, “learning to spell enhances children’s reading and writing” (p. 12). Moats discusses the difficulties students have memorizing all of the words we ask them to. Unless they have a sound understanding of how letters and sounds correspond with each other, they will be unsuccessful. She adds, “learning to spell requires instruction and gradual integration of information about print, speech sounds, and meaning – these, in turn, support memory for whole sounds, which is

used in both spelling and sight reading” (p. 12). She identifies a strong connection between spelling and writing skills, stating writing requires an “automatic deployment of basic skills” including but not limited to “spelling, handwriting, grammar, and punctuation” (p. 12). In order to focus on writing topics, organization of writing, and word choices, the writer must be able to navigate basic skills with automaticity; something those who have weak spelling skills are unable to do.

A meta-analytic review conducted by Graham and Santangelo (2014) of fifty-three studies included 6,037 students in total. This study further supports the notion that spelling instruction is beneficial to students’ academic achievement. The authors coded the fifty-three studies based on eleven quality indicators (“high quality design, correct unit of analysis, intervention fidelity, teacher condition, teacher effects, acceptable attrition, comparable attrition, pretest equivalence, no pretest floor/ceiling effects, no posttest floor/ceiling effects, and reliable measures”) to determine the value of the study (p. 1710). Researchers determined “about one-half of the studies were true-random experiments, and pretest equivalence and attrition were not an issue in most studies” (p. 1717). They found within ten different studies, spelling instruction produced an effect size (ES) of .70. They found within twenty different studies, spelling instruction enhanced students’ reading skills by an ES of .44. Overall, Graham and Santangelo found with explicit spelling instruction, across all studies, spelling performance improved and remained that way over time, resulting in an increase of correctly spelled words within writing. They noted positive increases in students’ word reading and comprehension across all reading measures.

While it is evident spelling instruction is an essential component of literacy instruction, educators continue to ignore it. According to the National Governors Association Center for Best

Practices & Council of Chief State School Officers (2010), the Common Core standards omit spelling as an actual foundational skill. They do, however, imbed components of spelling into phonics, phonological awareness, and fluency standards. By not clearly defining spelling as a standard, teachers are much less apt to include it in their instruction. McNeill and Kirk (2014) uncovered another issue involving spelling instructional practices. McNeill and Kirk randomly selected and surveyed 405 elementary school teachers in New Zealand (categorized by regional location and socioeconomic status) to determine their spelling assessment and instructional practices and compare beliefs about spelling to actual practices. McNeill and Kirk found a large disassociation between teachers' beliefs about spelling instruction and the actual implementation of spelling instruction. The reasoning differed amongst individuals, but common themes were confidence levels of teachers' professional knowledge of spelling instruction and finding time within the curriculum to teach spelling skills.

Developmental Stages of Spelling. According to Bear et al. (2012), in the early 1970s, seminal researchers Read and Chomsky, took notice of children's invented spelling, realizing it was not random letter formations, but an attempt at grasping the written English language. At about the same time, Henderson began looking at the developmental stages of spelling acquisition. He noticed errors made by students developed patterns and had meaning. According to Bear and Templeton (1998), students with learning disabilities have delayed progress; however, their spelling develops in the same sequence with similar errors as other learners. Ganske (2014) defines the stages of spelling development as: emergent, letter name, within word pattern, syllable juncture, and derivational constancy. Children's understanding of print in the *Emergent* stage varies; however, through experiences with print and explicit instruction, development can occur quickly. Scribbles turn into more developed lines and curves as children

see proficient writers writing and notice print around them. Children then begin to write letters and letter-like symbols, unaware of their sounds or meaning. Children in the emergent stage eventually develop phonemic awareness and concept of word. Children who have developed a concept of word and have recently begun to read enter into the *Letter Name* stage of development. These readers know most beginning sounds, directionality, letters of the alphabet, letter-sound correspondence, and have a partial ability to spell consonant blends and diagraphs. In this stage, children approach words one letter at a time, as they rely heavily on the names of letters to help them (buh-aye-kuh=BAK for bake). As instruction continues, children develop the ability to spell most consonant blends, diagraphs and common long vowel words and enter into the *Within Word Pattern* stage of development. In this stage, children have developed sight word vocabulary and can read familiar texts. Students are able to chunk parts of words together rather than reading letter by letter. In this stage, readers are able to read with some phrasing and expression, allowing them to construct meaning from texts. In the *Within Word Pattern* stage, children typically have an understanding of initial and final consonants, r-influenced vowel patterns, frequently used long vowel words, and abstract vowels. Students who reach the *Syllable Juncture* stage of development are typically in intermediate grades and are proficient readers. Students within this stage have developed a large vocabulary and can understand complex spelling patterns such as the following: most long vowel patterns, consonant doubling, double and e-drops with inflected endings, vowel patterns in unstressed syllables, and long vowel patterns and r-influenced vowels in accented syllables. Once learned, students enter into the final stage of development, one many remain in, even in adulthood. The *Derivational Constancy* stage focuses on words of Greek and Latin origin. Some characteristics of this stage include silent and sounded consonants, consonant and vowel alterations, Latin-derived suffixes, and assimilated

prefixes. Ganske claims even many “expert” readers and writers have yet to master all components of this stage.

Suggested Methods of Spelling Instruction. Throughout my research, I have found a wide variety of researchers’ suggestions for spelling instruction. A common theme throughout my research has been multimodal and data driven instruction using a Developmental Spelling Inventory. Sayeski (2011) states that sadly, typical spelling instruction is incidental (based on errors students make) and basal (part of a larger reading program). The issue with these types of instruction is the disregard of spelling patterns. Spelling tasks are homework or busy work, eliminating explicit instruction essential for mastery.

Many researchers have provided easy-to-incorporate examples of multimodal, engaging activities for a literacy curriculum. Ganske (2014) suggests students in the earlier stages of spelling development experience print and are engaged in storytelling, sound play, rhyming and alliteration games, nursery rhymes, and read alouds. As students enter into school, teachers should read aloud from big books, showing directionality from left to right, use repeated readings, use predictable texts with rhyme, rhythm, and an obvious sequence, choral reading, echo reading, and buddy writing and reading. McGee and Richgels (2012) suggest implementing guided spelling instruction in the classroom and to divide students by spelling ability. Within these groups, students can engage in word sort activities and word hunts (in newspapers, throughout the school, online, etc.) based on specific patterns are the focus of the lesson. Morrow (2012) suggests games and activities such as: a letter box (5-6 letters make up spelling words in a box for students to create the words), scrambled spelling words, decorative spelling collages, spelling detectives (find errors in spelling words within the classroom), word hunts, tracing a word on a partners back and guessing, and finding hidden words within nonsense words.

Regardless of the task, the activity should match their developmental level, be engaging, and allow for manipulation and discovery of words and the letters that compose them. Most importantly, Abbott (2000) states, in order to implement spelling instruction successfully, educators must:

- (a) Reorganize their understanding of the components of good literacy instruction to include a solid knowledge of how English is structures, (b) learn the characteristics of student developmental levels, and (c) use an instructional method that promotes learning within the meaningful context of discovery. (p. 243)

If educators do not keep up on current research and strive to fully understand the content they teach, we cannot ensure students will fully grasp those concepts either.

Spelling Instruction for Students with Autism. Students with autism differ in their learning abilities and styles, making individualized instruction essential to their success. Gardner (2006) discusses the idea of students accessing multiple intelligences to learn. This concept centers on the idea that we learn through multiple facets (linguistic, logical/mathematical, spatial, bodily/kinesthetic, musical, interpersonal, intrapersonal), some we have strengths in, others we do not. Instruction should hone in on our strengths and utilize them to enhance our learning experiences. Differentiation based on learning style, ability, and need is essential for student success, especially in a special education setting (Morrow, 2012; Johnson & Keier, 2010).

Narang and Gupta (2014) conducted a study to determine effectiveness of using three different multimodal strategies with three groups of elementary students with autism (tactile/auditory/kinesthetic for Dyseidetic spellers (phonetic), visual orthographic for Dysphonetic spellers (visual), and listen, speak, read, and write for the mixed group). The study incorporated multimodal techniques to meet the diverse needs of the learners. Some of the

modalities used include auditory, tactual, kinesthetic, visual, motor, and vocal. The visual and mixed group relied on visual modality, showing improvement with this technique. The phonetic group showed significant improvement in response to the tactile/auditory kinesthetic techniques. The visual group's emphasis was on morphology while the phonetic group's emphasis was on phonology. By catering to the learning needs of each group and using techniques suited for them, the results showed significant improvements in spelling deficits across all three groups.

According to Darch, Kim, Johnson and James (2000), students with autism have a great deal of difficulty spelling because they cannot devise and utilize "spelling strategies that allow for systematic application of spelling rules" (p. 15). Through their study, they found students with autism benefited from specific spelling strategies taught systematically for various word types. They found without this type of instruction, students used inappropriate strategies (ex. brute force- writing anything coming to mind regardless of accuracy or use of multiple, resource-based strategies not pertaining to the task). Students with autism do not consistently use their sound-symbol knowledge, cannot identify spelling errors, and have difficulty using new or learned strategies. They found skill-directed, intensive, rule-based instruction is the most effective method of spelling instruction for students with autism.

Sayeski (2011) found by using the stage theory of spelling development, through systematic instruction, immediate corrective feedback, and teaching of rules and/or morphology, students with autism are able to learn most effectively. McGuffin, Martz, and Heron (1997) conducted a study determining immediate self-correction of errors in spelling yielded higher outcomes than those who did not receive immediate corrective feedback

Hanser and Erickson (2007) completed a study examining the effectiveness of integrated word identification and communication intervention, specifically using the *Literacy Thought*

Unity: Word Study program. Their findings show generalization can occur using augmentative and alternative communication systems, when explicitly teaching spelling concepts (decoding, encoding, and icon sequencing). The three participants showed a 13.33 percent improvement in developmental spelling over a six-week period. The authors suggest students with communication needs should engage in integrated reading, writing, and communication instruction, specifically using the *Literacy Through Unity: Word Study* program. They found all participants in the study showed behaviors indicating they now think of themselves as readers and writers, a goal for all teachers.

Bailet (1990) conducted a study investigating the use of various spelling rules amongst students with autism and normally achieving students. Bailet found students across all ability levels fail to apply their rule knowledge at appropriate times and the structure of the task can often affect their ability to apply their knowledge. She found students with autism typically use morphological principles less than normally achieving students. In addition, student with autism resorted to phoneme-grapheme correspondence rules. Bailet found students with autism over generalized suffix rules (specifically -ed), possibly due to the inconsistency of the words' pronunciation or the abstract nature of the "past" concept of time. Bailet suggests teachers can improve students' spelling abilities through linguistic instruction that directs attention to specific morphological rules.

According to Vaughn and Bos (2012), students with autism learn best when they understand the meanings of words and see fewer words at a time. Vaughn and Bos state spelling instruction should "provide students with spelling strategies or systematic study and word practice methods" in order to ensure improvement (p. 306). They suggest spelling instruction be taught explicitly with sufficient practice and feedback. Teaching of spelling patterns should

incorporate words appropriate for the student's ability level. Instruction should include maintenance of previously taught words, motivational activities, and activities incorporating use of the dictionary. As cited in Vaughn and Bos, the most effective instructional spelling practices for students with autism include providing a weekly word list, error imitation and modeling, providing three spelling words each day, modality, computer-assisted instruction, peer tutoring, teaching of study techniques, and explicit, systematic instruction in spelling (Gordon, Vaughn, & Schumm, 1993; Wanzek et al., 2006).

Beirne-Smith and Riley (2014) suggest students with language difficulties, as many with autism have, such as articulation or mispronunciation, will inevitably have difficulty in spelling. Students who have difficulty with vocabulary acquisition, handwriting, and reading may similarly find difficulty with spelling. When combined with lack of motivation, difficulty understanding concepts, inability to follow directions fully, and inability to focus, students with disabilities must fight an uphill battle to achieve at the same rate as their peers.

Spelling assessments. Research on spelling instruction has yielded a plethora of effective methods; however, it is essential to understand how each student learns and cater to their individual needs. Constant assessment is an integral component of identifying student strengths, deficits, and developmental stages in spelling. According to Ganske (2014), developmental spelling inventories provide teachers with a quick and easy method of analysis that accurately defines developmental levels.

Beirne-Smith and Riley (2014) describe the advantages and disadvantages of formal and informal assessments in spelling. Typically, formal assessments are done to place students or to determine unbiased progress through pre- and post-tests. The issue with formal assessments is the nature of the tests administered and how they truly assess students. Tests requiring recall or

recognition require different skills and therefore cannot determine the true knowledge of each student. Informal assessment helps evaluate transfer of skills, show trends, and provide a more direct relationship to instruction. Beirne-Smith and Riley suggest supplementing assessments by conducting observations and interviews to gain a multi-faceted view of the student's abilities.

Pearson (2012) analyzed common assessments of spelling ability, providing positives and negatives of each type. Pearson claims word lists should contain rules or patterns and teachers should differentiate for each ability level. She insists analysis of spelling be at a deeper level than "correct/incorrect," as spelling errors can provide valuable information about a student's understanding. She states marking "correct/incorrect" is vague for students and provides little feedback on what requires improvement. Pearson says with dictated spelling tests, the words should be carefully chosen, be applicable to the students' lives, and they understand the meaning of the word, as it should be provided in sentence form as well as in isolation. If students learn words by rote, they will be able to spell them on assessments, but transference to other aspects of academics is questionable. Pearson categorizes spelling assessments into productive and recognition tasks and insists both be used, as both skills are important to master. Productive tasks include dictation tests, finding synonyms, cloze, adding morphemes, and correcting spelling errors. Recognition tasks include multiple choices, identifying incorrect spellings, unscrambling words, adding missing letters.

Calhoon, Greenberg, and Hunter (2010) investigated and compared five standardized tests' orthographic assessments. The researchers found teachers typically draw conclusions about student ability based on standardized test scores; however, they have little knowledge about the concepts assessed within them. The five tests included the Kaufman Test of Educational Achievement-Comprehensive; Kaufman Test of Educational Achievement- Brief; Woodcock-

Johnson-III Form A, B, and C; Wide Range Achievement Test 4, forms blue and green; and the Wechsler Individual Achievement Test II. The results of this investigation found many similarities between the tests, but no test covered all orthographic skills. The researches insist no student's abilities should be determined based on a single assessment, as it is nearly impossible for a single test to encompass all aspects of spelling, meet all types of learning, and cater to individualized test taking abilities.

Invernizzi and Worthy (1989) completed a study comparing spelling errors of normal students to learning disabled students. In their study, they found both learn at similar rates when grouped based on ability levels. The authors state their findings suggest students of all abilities require explicit instruction on various spelling patterns at their own level of achievement, which may or may not correspond with their grade level. Al Otaiba and Hosp (2010) determined spelling assessments should not be constrained by student ability or grade level. They found it is much more beneficial to use detailed error analysis rather than the old-fashioned "correct/incorrect" responses. McGee and Richgels (2012) discuss a type of assessment using this type of detailed error analysis to guide spelling instruction. They found that a systematic approach to assessing and analyzing spelling is using a developmental spelling inventory. The authors recommend using the *Words Their Way*TM spelling inventories and feature guides, as they provide thorough analysis of a variety of spelling patterns and features specific to developmental stages of learning.

Words Their Way: Word Study for Phonics, Vocabulary, and Spelling Instruction.

According to Bear and Templeton (1998), research indicates the following three instructional practices are essential for student success: "students should be grouped appropriately for spelling and word study, students should examine known words, and students

should be guided toward discovering patterns and generalizations among words they examine” (p. 229-230). The *Words Their Way: Word Study for Phonics, Vocabulary, and Spelling Instruction* program encompasses all three instructional practices, as well as many key characteristics outlined previously in the chapter.

The idea behind the *Words Their Way*TM program is exploration with words through manipulation, sorting, categorizing, comparing, contrasting, and studying. The systematic approach to learning includes a teacher’s manual explaining each stage of spelling development in depth, as well as the program in its entirety. Supplemental books are available for each developmental stage, going even more in depth, providing lesson plans, schedules, assessments, and analysis guides. The program allows teachers to access online resources such as how-to videos, game templates, word sorts, assessment tools and teaching guides.

Based on the grade or ability level of the student, the teacher chooses from the Primary, Elementary or Upper-Level Spelling Inventory. These inventories are lists of 20 or more words progressing in difficulty. Each word contains key spelling features a child should understand at a specific stage of development. The teacher dictates words as the student spells them out on paper. Once complete, the teacher analyzes each spelling word using a feature guide. This guide highlights specific patterns within the words the child either hit or missed. The total number of features hit and spelling words spelled correctly is added together, providing a “power score” indicating where each student falls within a particular stage of development. These scores belong in the class composite provided by the program. This composite allows teachers to monitor progress of the entire class in an organized manner. The composite can be used to group students for spelling instruction, as it provides a visual representation of student ability. Bear et al. (2012)

suggest making groups of six to eight, as it allows for collaboration and discussion. They suggest the groups created be flexible based on continuous progress monitoring.

Using the *Words Their Way*TM program, teachers can conduct informal observations of reading and writing. Student writing provides a great deal of insight into their understanding of the English language and how they interpret it on paper. When students read, words they find difficult decoding often correlate with spelling difficulties. Bear et al. (2012) suggest teachers take notes of students reading and writing to gauge progress made in spelling acquisition. Teachers can use the grading form provided by the *Words Their Way*TM program to assess effort, strengths, and weaknesses.

Once each student's developmental stage is established, teachers create groups and instruction can begin. The *Words Their Way*TM program provides examples of weekly schedules for each stage as well as for different grade levels. A routine for *Words Their Way*TM instruction should follow a circle-seat-center format. Students in one group meet with the teacher to work on a new concept for 15-20 minutes (circle time), then go to their seats to work independently or with a peer (seat time), then rotate to a center activity (center time). Centers can correlate with word study activities or integrate portions of Reading and Writing instruction. As a routine is being developed, the teacher should model how to discuss the word sorts with their peers, how to look critically at the words within the sorts, and expectations for center time. There should be a time each week where the teacher is able to meet with each group for explicit word study instruction, introducing new concepts for the week and allowing for observation of understanding and progress. Teachers should assess students throughout the week to gauge progress made and drive future instruction.

The basis of the *Words Their Way™* program is hands-on learning through word sorts and activities. Each week, each group of students at a particular developmental stage focus on a single spelling feature or pattern specific to their ability level. Throughout the week, students complete various activities involving the particular spelling feature. Teachers have access to lesson plans progressing each week, containing word sorts and various activities. A typical week for students working with picture sorts (emergent & letter-name alphabetic stage), as suggested in the *Words Their Way™* program consists of picture sorts, drawing and labeling, cutting and pasting, word hunts, and games. A typical week for students completing word sorts (within-word pattern, syllables and affixes, and derivational), as suggested by the *Words Their Way™* program consists of word sorts, drawing and labeling five to ten words, writing the words and sorting them, “word operations”, use the words in sentences, word hunts, speed sorts, and blind sorts. Sorts vary based on developmental stage and include sound sorts, pattern sorts, and meaning sorts. Students do sound sorts within the emergent stage, letter-name alphabetic, and early within word pattern developmental stage. Sound sorts are done with pictures without labels, prompting the students to identify sounds within the word without focusing on the alphabetic composition of the word. Students within the letter-name alphabetic, within word pattern, syllables and affixes, and derivational stages of development, do pattern sorts. Pattern sorts use words rather than pictures and are sorted based on various patterns within the words. Pattern sorts include “oddballs” or exceptions to the rule taught, allowing students to compare, contrast, and analyze various words within each word pattern. Meaning sorts, done throughout all stages of development, differ from sound and pattern sorts because they focus on concepts or meanings of words rather than sounds. Meaning sorts help students develop vocabulary and conceptual understanding of topics, including those outside of literacy. Concept sorts can be anticipatory

sets, activating background knowledge for students and preparing them for what the lesson entails. Meaning sorts can incorporate homophones, homographs, roots, and stems of words, allowing students to explore words, understand their meaning, and see the spelling of the words. Drawing and labeling activities require students to draw pictures of objects and label them. This activity allows students to make meaning of the words and express it visually. Cutting and pasting activities require students to search through various genres of text to find pictures pertaining to the week's spelling feature. Students cut the pictures out and paste them into their notebooks. Similar to cut and paste activities, word hunts require students to search texts and the school for words pertaining to their week's spelling features and paste them into their notebooks. Writing sorts require students to sort the week's words in their notebooks, reinforcing their memory of the words and handwriting skills. Speed sorts are a motivational game where students time themselves to see how quickly they can complete their sorts independently. Word operation is an activity where students dissect the letters of a word and create a new word with them. Blind sorts are done as a form of assessment where a partner or teacher dictates the words and the student spells and categorizes them in their notebook.

Throughout my research, only one study was completed involving the *Words Their Way™* program. Harris (2007) conducted a study using the *Words Their Way™* program with ninth graders in an urban high school. Throughout the article, Harris provides "tips for adolescents" I can apply to my own study, as they are tips for motivation, engagement, and comprehension. The study resulted in an increase in spelling ability and confidence in writing. Harris concludes word study is an important, yet ignored component of middle and high school education. Harris suggests to cater to older students, modifications be made with pictures, texts, and activities increase interest and engagement.

Summary of Literature

Students with autism are a growing population, with diverse and specific educational needs. Though the cause is still unknown, we are aware of the cognitive, social, emotional, and behavioral characteristics presenting themselves. Each student is unique and presents individual characteristics of autism; therefore requiring individualized instruction.

Spelling is an essential component of literacy instruction; however, teachers typically ignore it due to their lack of confidence in teaching it and other areas of literacy being more prominent. The acquisition of spelling intertwines with reading and writing instruction. Spelling development occurs in stages and instruction can begin in pre-school. Research has uncovered a variety of strategies and methods for teaching spelling to all learners, though students with autism require more targeted and literal instruction.

Assessments to determine ability levels are essential to effective spelling instruction. The *Words Their Way*TM program provides a format for assessment at all ability levels as well as subsequent spelling instruction. The *Words Their Way*TM allows teachers to differentiate instruction based on student need through hands-on, interactive, engaging tasks.

Chapter 3: Study Design

Participants

I used a non-probability, convenience sample. This study was comprised of five students within my classroom. The students involved in the study are all males between the age of 15 and 18. The five students involved in the study all are diagnosed with autism. Student A is additionally diagnosed with Oppositional Defiance Disorder, Obsessive Compulsive Disorder, Attention Deficit Hyperactive Disorder, and mild Mental Retardation. Student B is additionally diagnosed with anxiety. Student C is additionally diagnosed with echolalia. Student D is

additionally diagnosed with intellectual disabilities. Student E is additionally diagnosed with social phobia, moderate mental retardation, and anxiety.

Selection of participants for this study depended on their availability for research activities. Due to difficulty with change and transition for many students within my school, I chose to focus on the students within my self-contained classroom. I sent home consent forms for all of my students to participate. I received permission from five parents and students to include them in my research. The lessons implemented and assessments done are part of my classroom curriculum, and therefore they did not receive any extra credit for participation.

The population within the school has high needs and typically significant academic deficiencies, much different from typical students with disabilities in public schools. The data collected within this study is specific to the five students who took part and results cannot be generalized, though use as a reference for future research or program implementation would be beneficial.

Setting

This study took place in a private Special Education school in a suburb of Rochester, New York. The research took place within their 6:1: 3 (six students, one teacher, three teaching assistants) classroom, during school hours of 8:30am – 2:30pm, Monday through Friday for a duration of six weeks.

Positionality of the researcher

I completed my bachelor's degree through the College at Brockport, State University of New York's Department of Education and Human Development in Childhood Education with a concentration in Interdisciplinary Arts for Children. Additionally, I obtained a degree for Education of Students with Disabilities. For completion of my undergraduate degree, I

completed two student teaching placements. One student teaching placement was in a 4th grade urban school where 60% of my students received ESOL services. My second student teaching placement was in a 3rd grade inclusive classroom in a suburban school. Of the 20 students, eight received various special services and had an Individualized Education Program (IEP). Within both of these placements, I worked to improve their academic skills through multi-modal forms of instruction.

After graduation, I began working towards my master's degree in Literacy Education for students birth-12th grade. I completed graduate school at the College at Brockport. Throughout the first semester of graduate school, I was a substitute teacher at various suburban schools around Rochester, New York. I was a Substitute Behavior Assistant for BOCES-2. In the fall of 2013, I began teaching at a private Special Education school.

It is my belief literacy is the cornerstone for education, as it transcends all subject areas. I believe it is our responsibility as educators to effectively prepare our students for college and career readiness by establishing a firm foundation in literacy. Literacy is an essential tool, both in and out of school. We must inspire our students with rich, engaging literacy experiences so they can further develop and utilize their skills into adulthood. With my experiences in interdisciplinary arts, it has become a priority to teach through the use of Howard Gardner's Theory of Multiple Intelligences (2006), that individuals learn best through a variety of media, and it is the teacher's responsibility to identify those "intelligences" and teach through them. Much like Dewey (1902) and Bruner (1960), I believe individuals learn most effectively through socially interactive, hands-on, problem solving, and discovery activities. These activities have more meaning and are memorable to students. My beliefs in differentiation of instruction mirror Vygotsky's theory (1978) that teachers should identify each student's zone of proximal

development and teach within the zone. I believe differentiating instruction based on individual student learning needs is an essential component of education.

Having had personal experiences with family members with special needs, I have a great deal of passion for the profession and take advantage of opportunities to expand my knowledge in the field. I began my career as a Special Education Teacher because of my passion for the population. My experiences within the profession have furthered my desire for improving literacy education for students with disabilities. I believe all students have the ability to learn and it is our job as teachers to identify how to teach them most effectively based on their needs. Chomsky's theory of language acquisition (1965) supports the idea that all individuals have the innate ability to develop and understand language through experiences with their environment.

Methods of data collection

This study incorporates a variety of forms of data collection in order to gather adequate data for investigation of the research question. According to seminal researchers Glaser and Strauss (1967), I used the constant comparative data analysis throughout my study. This method of data analysis involved a series of steps coding the data throughout the study to identify themes of importance.

I used initial and final Words Their Way Developmental Spelling Assessments, initial and final Running Records and Comprehension questions, initial and final interview questions, informal observations, and student journals.

Quantitative assessment data was scored using both single-item and summed scores, data was prepared for analysis using Microsoft Excel, data was analyzed using measures of central tendency and relative standing to answer the research question, then data was analyzed to test comparison and relationship hypothesis (Clark & Creswell, 2010).

Qualitative data from observations, interviews, and student journals were prepared. I conducted a preliminary exploratory analysis, and then used constant comparative data analysis to code the data collected. Following the steps qualitative data analysis suggested by Clark and Creswell, I first prepared the data by organizing it and getting a general idea of what it consisted of. I then conducted a preliminary exploratory analysis, allowing myself to get a gist of what the data presented (2010). As suggested by Hubbard and Power (1999), I “cooked” the data, categorizing notes by personal, methodological, and theoretical, looking at them with a critical and analytical eye. I continued to sift through the data and color-coded various reoccurring concepts or ideas. Once I cooked and coded the data satisfactorily, I created an index for reference assisting in identifying commonalities, reoccurrences, and other trends throughout the data. This coding system helped me in analyzing and drawing a conclusion. Validation of results occurred through triangulation of data, member checking, and a colleague conducted an external audit (Clark & Creswell).

Words Their WayTM Developmental Spelling Assessment. Initially, I assessed each student to gather a baseline for the study. The initial assessment used the *Words Their Way*TM spelling inventories and chart for analysis. Based on each student’s literacy abilities, I chose a list to begin with (Primary, Elementary or Secondary). Each list contained 20-30 words progressing in difficulty. Each student was asked to spell to the best of his abilities based on word dictation and having the word provided in a sentence. I conducted these assessments until the student spelled five or more words incorrectly. If the student spelled a majority of them correctly, I moved on to a more difficult list and reassessed. Once the student was finished, I transferred their spellings to a word analysis chart. Analysis of the Developmental Spelling Assessments is explained in depth by Bear et al. (2012) in the *Words Their Way* Teacher’s

Manual. This chart allowed me to analyze the number of words spelled correctly, feature points of words the student used or missed, and the sum of the two criteria. Based on the total score, I was able to determine each student's developmental spelling stage. This information provided me with a starting point for the program. At the completion of the study, I conducted the same assessment as I did initially to determine progress made in orthographic abilities. The assessments used initially and finally were identical to maintain consistency. The data collected provided me with information on student progress over the 6-week period. I conducted the final assessment in the exact same way as I did initially.

Running Records and Comprehension Questions. Initially, I conducted running records with each student to determine their fluency abilities, comprehension, and instructional levels (Clay, 1995).

I conducted the running records using benchmark assessments from www.readinga-z.com on each student's reading level. Each student read a passage aloud as I coded based on words read correctly and errors made. Once the passage was completed, students completed comprehension questions measuring their understanding of the text. Analysis of student running records focuses on errors and self-corrections made while reading aloud. Errors and self-corrections are analyzed based on meaning, syntax, and visual cues, providing me with an overall understanding of what each student does while reading and what skills need to be worked on in order to improve. Error rates are determined by dividing the number of words within the passage by the number of errors made when reading. This rate is in ratio form; however, scores were converted into a measure of relative standing using a percentile rank. The percentage shows the amount of the text the student read incorrectly. The accuracy rate is determined by subtracting the number of errors made from the total number of words. This number is divided by the total number of words and multiplied

by 100. The accuracy rate shows the amount of text the student read correctly. To determine the self-correction rate, the number of errors and self-corrections are added together then divided by the number of self-corrections. This rate is in ratio form; however, scores were converted into a measure of relative standing using a percentile rank. The self-correction rate shows the number of times a student self-corrects himself when reading. This is an indicator of a student's ability to monitor comprehension and meaning while reading.

At the conclusion of the study, I conducted running records with the same passage to determine progress over the duration of the study while maintaining consistency. I used this information to determine whether progress made in orthographic ability had a relationship with fluency and comprehension abilities.

Interviews. An interview (Appendix A) took place with each student at the beginning of the study. This interview was an informal conversation with the students, discussing their interests, levels of engagement, favorite subjects, ways they like to learn, and questions they had for me. The information gathered allowed me to identify motivating and engaging topics. Student responses helped me gauge how they feel about literacy and learning as a whole. At the conclusion of the study, I conducted another informal interview (Appendix B) to see what their favorite activities were and why, what they disliked and why, and how they feel about their abilities after the study has finished.

Observations. Each day, I made informal observations (Appendix C) throughout the individual lessons. These observations provided me with essential information and allowed me to recall certain moments I felt were important, including but not limited to levels of engagement, levels of motivation, questions asked, frustration levels, maladaptive behaviors, and an overall gist of how the lesson went. The observation data helped me identify certain lessons resulting in

high levels of engagement and motivation. The observation data helped me identify certain lessons resulting in frustration or maladaptive behaviors.

Journals. During each lesson, the student completed his work in a personal journal. Within this journal, I kept observation notes helping me recall moments I deemed important. Because some students do not have strong handwriting skills, I interpreted the writings as need be to help with recalling information later. The journals provided me with day-by-day data I analyzed for trends and themes.

Procedures

This study was conducted over a six-week period during November and December of 2014. I implemented the study five days a week for about 20 minutes during the hours of 8:30am – 2:30pm. This study was done within my 6:1:3 self-contained classroom as part of my Literacy curriculum.

As the *Words Their Way*TM program is part of my normal literacy curriculum, I have used the program intermittently throughout the 2014-2015 school year as a pilot study. I assessed each student's developmental spelling level; however, I did so again to determine current levels of ability. For this study, I followed the protocols set forth by Bear, Invernizzi, Templeton, & Johnston verbatim, without extensions and revisions of my own to determine the effectiveness of the program as is.

On the first day, I began by conducting initial assessments with each student. These assessments were the *Words Their Way*TM Developmental Spelling Assessment, a running record and corresponding comprehension questions, and an initial interview. These assessments provided me with a baseline for my study and critical information helping direct my instruction. The interview provided me with ideas for motivation and engagement to ensure I could complete

all my lessons and gather adequate data. The spelling and reading assessments helped me determine progress due to the use of the program with my students.

Each week I taught lessons on a daily basis for a duration of ten to twenty minutes based on levels of engagement and compliance. Because of the nature of the school and the individual attention each student requires, the lessons were on an individual basis. Each student has a designated time for literacy throughout the day and I taught the lessons with each student. These lessons included word sorts, word searches, building and manipulating components of words, drawing and labeling, reading a variety of books, and playing games. Each week, I targeted a specific element based on each student's developmental spelling stage. In the emergent stage, the concept sort themes changed each week but followed similar lessons. In the letter-name alphabetic stage, the students worked on different digraphs each week. Initially they learned the letter-sound correspondences for each letter of the digraph (ex: /s/ and /h/), and then they learned the sound the two letters make together (ex: sh-). They then completed daily activities around these sounds (/s/, /h/, and sh-). In the syllables and affixes stage, the students worked on inflected endings, compound words, and syllable junctures. These students had a firm grasp on basic spelling patterns and rules so I focused on more complex spelling rules and strategies. Appendices D-F outline a typical week's work for each stage of development. Based on the developmental spelling stage, developed through the initial Developmental Spelling Assessment, different elements of spelling were targeted throughout the six-week period, as outlined in Appendix G. Throughout each lesson and assessment, I took informal observations (Appendix C) to record any important information.

At the culmination of the six-week period, I conducted final assessments with each student. These assessments included a final *Words Their Way*TM Developmental Spelling

Assessment, a running record with corresponding comprehension questions, and a final interview. The final assessments allowed me to determine the amount of progress since the beginning of the program's implementation, and to what degree. The summation of the study was a time for me to discuss likes and dislikes with each student to see possible alterations for the future.

Criteria for trustworthiness

The research done throughout this study used a variety of research practices ensuring trustworthiness and validity of outcomes. Prolonged engagement and persistent observation occurred throughout the six-week period of data collection. Throughout each week, I collected data daily in the form of informal observations following an observation outline (Appendix C). I collected data through formal assessments in the beginning and end of the study to assess progress made. I analyzed journals of daily student activities at the culmination of the study as well. I used six different forms of data collection to ensure validity of the study.

Chapter 4: Analysis of Data

Throughout a six-week period of data collection, I followed a single-subject experimental design and case-study research design (Clark & Creswell, 2010). Due to the nature of this study's mixed-method data collection, analysis of the data occurred in a variety of ways. Through thorough analysis of the raw data, I determined four prominent themes, which are improvements in spelling, reading, and handwriting abilities, obstacles observed, and varied levels of motivation, engagement, and attitude. These themes help guide me in answering my question: What are the effects of using the *Words Their Way*TM program with teenage boys with autism?

Improvements

Through thorough analysis of the data collected for this study, I determined a prominent theme was the improvements students made in spelling, reading, and handwriting. The *Words Their Way*TM program provided a variety of experiences for students to spell, read, and write, enabling them to improve through repetition and practice.

Spelling Abilities. Throughout the six-week study, I assessed spelling abilities and differentiated of instruction for each student. Across the board, improvements became evident.

The results for initial and final scores appear in Figure 1. I converted scores into a measure of

	Student A	Student B	Student C	Student E	Mean
Words Correct Initial	68%	67%	23%	15%	43%
Words Correct Final	80%	84%	50%	42%	64%
<i>Difference</i>	12%	17%	27%	27%	21%
Feature Points Initial	79%	60%	59%	43%	60%
Feature Points Final	87%	97%	68%	71%	81%
<i>Difference</i>	8%	37%	9%	28%	21%
Total Initial	76%	63%	48%	34%	55%
Total Final	85%	93%	62%	62%	76%
<i>Difference</i>	9%	30%	14%	28%	20%

Figure 1: Developmental Spelling Analysis (DSA) Results: Initial and Final. This figure illustrates initial and final scores of each student, the difference, and the mean for all student scores.

relative standing using a percentile rank (Clark & Creswell, 2010). I used mean as the measure of central tendency (Clark & Creswell) for the Developmental Spelling Analysis data set (see figure 1). On average, the number of words each student got correct went from 43 percent to 64 percent, a 21 percent increase. Similarly, the feature points students got correct increased from 60 percent to 81 percent, a 21 percent increase. Overall, the total score for each student increased from 34 percent to 62 percent, a 20 percent increase. Based on the data collected, each student's orthographic ability increased by about 20 percent throughout the six-week study. In regards to

developmental spelling stages, each student progressed an entire developmental stage throughout the six-week period of explicit spelling instruction.

At the conclusion of the study, Student A went from spelling 17 words correctly and obtaining 49 feature points to spelling 20 words correctly and obtaining 54 feature points, progressing from the mid syllables and affixes stage to the early derivational stage of spelling. Initially, Student B was assessed using the upper-level spelling inventory determining he was developmentally at the middle of the syllables and affixes stage. At the conclusion of the study, Student B went from spelling 21 words correctly and obtaining 41 feature points to spelling 26 words correctly and obtaining 66 feature points, moving to the middle of the derivational spelling stage. Initially, I assessed Student C using the primary spelling inventory determining he was developmentally in the middle of the Letter-name alphabetic stage. At the conclusion of the study, Student C went from spelling 6 words correctly and obtaining 33 feature points to spelling 13 words correctly and obtaining 38 feature points, moving to the middle of the within-word pattern spelling stage. Initially, I assessed Student E using the primary spelling inventory, determining he was developmentally at the middle of the Letter-name alphabetic stage. At the conclusion of the study, Student E went from spelling 4 words correctly and obtaining 24 feature points to spelling 11 words correctly and obtaining 40 feature points, moving to the middle of the within word pattern spelling stage.

Student D is an emergent speller; therefore, the assessments used with him were different and was not comparable to his peers' assessments. The Emergent assessment measured knowledge of letters, letter-sound correspondences, rhyme identification, beginning sound alliteration, beginning letter-sound Identification, five kindergarten spelling words, and concepts of word. Initially, Student D was able to get through the first three categories of assessment:

capital and lower case letters. Of these, he identified 20 capital letters, 14 lower case letters, and four of 9 rhyme identifications. At the end of the six-week period, as shown in figure 2, Student

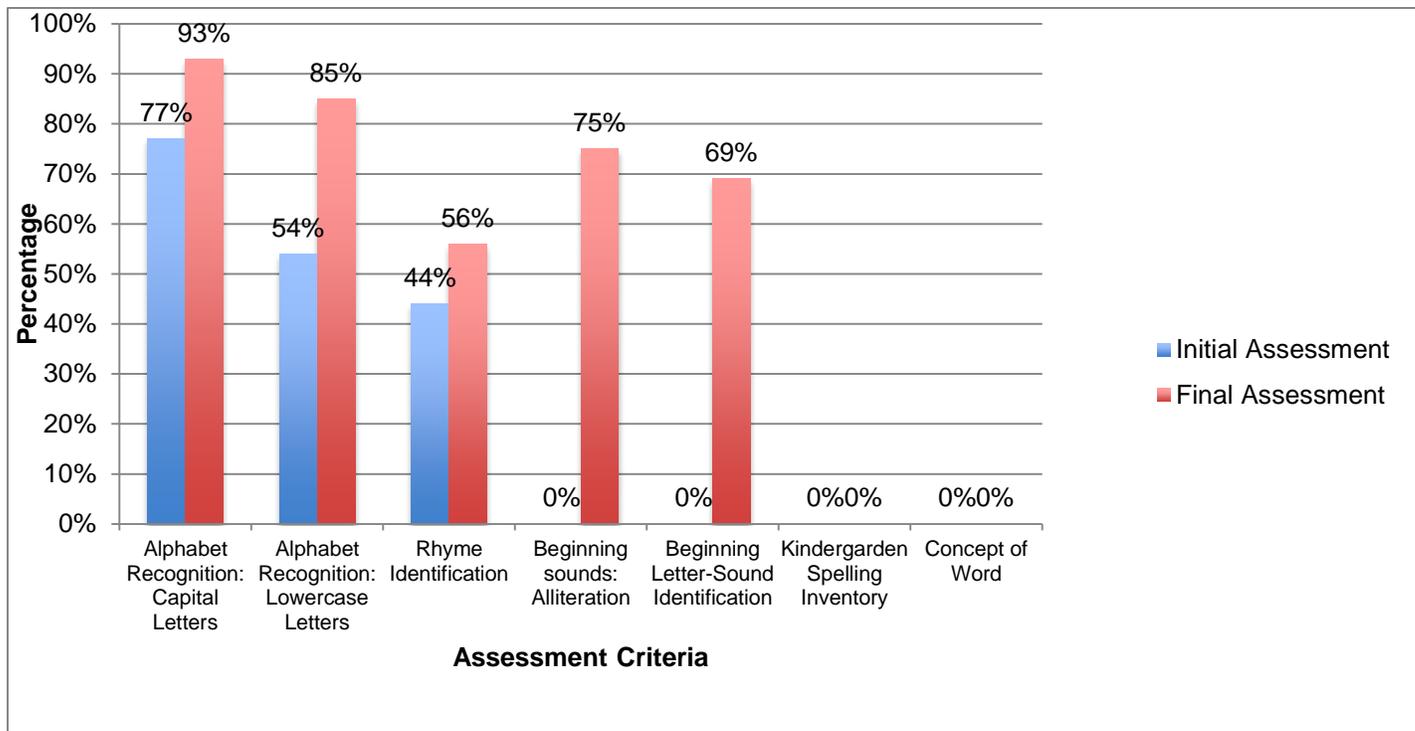


Figure 2- Initial and Final *Words Their Way*TM Emergent Assessment Results for Student D

D was able to complete all parts of the assessment. He was able to identify 24 capital letters, 22 lower case letters, 5 of 9 rhyme identifications, 6 of 8 beginning sound alliterations, 11 of 16 beginning letter-sound identifications, 0 of 15 Kindergarten spelling words, and 0 of 10 Concept of Word Questions. His concentration and perseverance to tasks were much higher during the final assessment, showing he made progress in his literacy abilities and gained ability to attend to tasks for longer periods.

Reading Abilities. Assessment of reading abilities occurred initially and at the end of the study; however, no direct instruction was provided through this study. Students received additional literacy instruction in the classroom, though not specifically on fluency and comprehension, as assessed by the running records and comprehension questions. Therefore, the

reading improvements cannot be completely attributed to the *Words Their Way*TM program. Table 3 shows each student's scores for initial and final running record and comprehension questions.

	Student A	Student B	Student C	Student D	Student E	Mean
Error Rate Initial	4%	2.1%	4.2%	50%	6.7%	13%
Error Rate Final	3%	1.7%	3%	20%	7.7%	7%
<i>Difference</i>	0.97%	0.38%	1.14%	30%	-1%	6%
Accuracy Rate Initial	96%	98%	96%	56%	93%	88%
Accuracy Rate Final	97%	98%	97%	81%	92%	93%
<i>Difference</i>	1%	0%	1%	25%	-1%	5%
Self-Correction Rate Initial	0%	.14%	0%	0%	0%	.03%
Self-Correction Rate Final	62.5%	33%	0%	0%	12.5%	22%
<i>Difference</i>	62.5%	32.9%	0%	0%	12.5%	21.6%
Comprehension Initial	60%	40%	33%	0%	67%	40%
Comprehension Final	100%	60%	67%	50%	100%	75%
<i>Difference</i>	40%	20%	33%	50%	33%	35%
Initial Level of reading ability	Instructional	Instructional	Instructional	Very Hard	Instructional	
Final Level of reading ability	Independent/ Instructional	Independent/ Instructional	Independent/ Instructional	Hard	Instructional	

Figure 3: Running Record and Comprehension Results: Initial and Final. This figure illustrates the initial and final scores for each student's Running Record and Comprehension assessment, the difference between the two, and the mean of all student scores.

I used the mean as a measure of central tendency for the Running Record and Comprehension data set. Overall, the error rate for the five students improved by 6 percent, meaning 6 percent fewer errors were made in reading compared to the initial assessment. The accuracy of student reading showed an overall increase of 5 percent, meaning students read 5 percent more words within their passages correctly in the final assessment. The mean self-correction rate increased over the six-week period by 21.6 percent. Finally, student comprehension scores showed a 35 percent increase. Based on the data collected, each student's reading and comprehension ability increased by about 15 percent throughout the six-week study, without receiving consistent explicit reading fluency and comprehension instruction.

Comparing initial and final assessments, when reading at a level K, Student A's error rate decreased by .97 percent, his accuracy rate increased by 1%, his self-correction rate increased by 62.5% and his comprehension improved by 40%. In both the initial and final assessments, all errors made by Student A maintained meaning and were syntactically correct, showing he was able to monitor comprehension and read for meaning throughout the passage.

Comparing initial and final assessments, when reading at a level Z, Student B's error rate improved by .38 percent, self-correction rate increased by 21.6%, the accuracy rate remained the same, and comprehension increased by 20 percent. Overall, Student B showed an increased awareness of basic phonic rules, slowing down to decode difficult words.

Comparing initial and final assessments, when reading at a level H, Student C made a 1 percent increase in his error rate and accuracy rate, as well as a 33 percent increase in his comprehension ability. Student C continues to have difficulty drawing conclusions and making inferences. When reading, Student C typically used visual cues to decode unknown words and did not self-correct errors made, showing he was not always reading for meaning.

Comparing the initial and final assessments completed with Student D at a level AA, he made 4 less errors and had an 25% increase in accuracy. In the final assessment, Student D used his knowledge of letter-sound correspondence, as many of the errors were similar visually and maintained meaning and syntax.

Comparing initial and final assessments, when reading at a level E, Student E's error rate improved by 1 percent, his accuracy rate decreased by 1 percent, his self-correction rate improved by 12.5 percent, and his comprehension improved by 33 percent. For Student E, motivation was a significant factor in his ability to complete the reading passage.

As evident by the data collected, all students showed progress in their reading abilities. While the study was not conducted to determine the effect spelling instruction has on reading, I believe by bringing attention to various elements of words and using them in various ways, student gain phonemic awareness and an understanding of the construct of words, allowing them to transfer this to their reading.

Handwriting Abilities. When looking over data from initial and final assessments, I noticed the handwriting in the final assessments was much more legible than in the initial for Students A, B, and E. The program requires students to write for different activities such as word hunts, drawing and labeling, creating sentences, and blind sorts. For example, Student A's handwriting was elongated and condensed, making it difficult to decipher the letters unless watching him write them initially. Each day, he would practice his handwriting by doing word sorts and other various activities. During the lessons, I often reminded him to slow down and neaten up his writing. Through repetition and consistent reminders, he required less reminding and continued to print legibly. In the final assessment, much more spacing appeared between the letters, making words easier to distinguish.

Student B has good handwriting, but often ignores spaces and writes large letters. Many times throughout the six-week period, I worked on this with him, reminding him to write small letters and not write on top of a previous line of text. For the final assessment, he was so used to me reminding him, he said the reminders aloud, without me having to say anything. Comparing the two assessments, the second sample has a great deal more spacing and the letters are much smaller and legible.

The most significant progress I saw in handwriting improvements was with Student E. Prior to the six-week period, Student E's handwriting was completely illegible, even to those

who have worked with him for years, as seen in figure 4. Many times, I would have to guess or ask him to say the letters aloud as he wrote them so I could make sure he was spelling them correctly. Throughout the six-week period, we did many *Words Their Way™* activities requiring him to write things down. I would remind him daily to slow down and write the letters so I could read them. Many times, I would go back after the completion of an activity and write notes next to the words in his journal so I could look back later and understand what was written. A different activity occurred each day, providing him with repetitive practice on writing specific letters. At the end of the six-week period, Student E was writing on the correct side of the paper, with much more clear handwriting, as seen in figure 5.

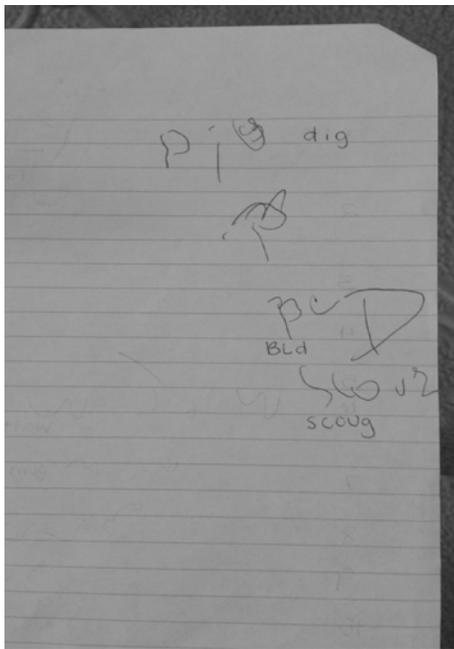


Figure 4: Student E Handwriting Sample Day One

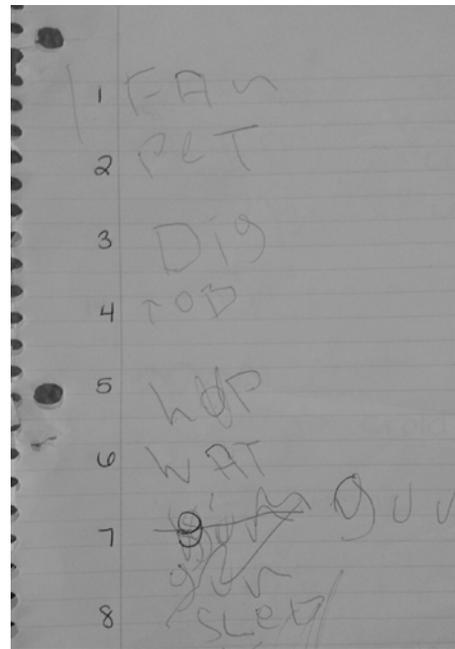


Figure 5: Student E Handwriting Sample Day 30

I believe through the repetitive practice required in many of the *Words Their Way™* tasks and consistent reminders made by me, all students received handwriting practice ultimately improving the legibility of their writing.

Obstacles

Throughout the study, I observed a great deal of obstacles the students faced due to various characteristics of autism, having a negative impact on academic progress in numerous ways. Many characteristics of the Autism Spectrum Disorder provide significant obstacles throughout a child's academic life. With the *Words Their Way*TM program, I noticed specific characteristics presenting themselves as obstacles for my students in one way or another. Those characteristics include: obsessive-compulsive tendencies, rote memory, auditory processing issues, concrete thinking, and expressive language limitations. Over the experimental six-week period, I noticed repetition and consistency helped combat these issues. Repetition and consistency helps students with autism because they can memorize a skill or process, making them confident, engaged, and safe; all essential components for growth in education.

Obsessive-Compulsive Tendencies. Students with autism need consistency and exactness in certain aspects of their lives, which often presents itself much like Obsessive Compulsive Disorder. Due to this, many of my students need the placement of objects to be in a certain way, even if it is incorrect in our eyes. For example, when asking students to complete word or picture sorts, Student A had a great deal of difficulty placing all of the words in the correct places because he was more preoccupied by how the sort as a whole looked. Many times, Student A would become disengaged with the task because it did not look right in his eyes. He required redirection and physical prompts to finish the task, and would often become upset and want to put words in the incorrect places because it would even the categories out. Similarly, Student B would often become disengaged with the task because his OCD took hold of him and he lost concentration. He required redirection and physical prompts to finish the task, and would

often become upset because he felt rushed, something he commonly deals with, as his OCD tendencies cause him to complete tasks with many idiosyncrasies.

For drawing and labeling, similar issues arose, as my students would fixate on perfecting the picture. Redirection and physical prompts were required to finish tasks accurately. However, after repetition and consistent prompting over the six-week period, they could break away from some of the obsessive compulsivity to make the sort look perfect, and were able to complete them based on accuracy.

Rote Memory. During the six-week period, a great deal of my observations noted students were memorizing the process of word sorts rather than actually understanding the idea behind them. Students with autism have an amazing ability to memorize concepts, patterns, and ideas; however, this ability does not translate into comprehension of those ideas or generalization to other academic facets. Many times, a student with autism can memorize a concept on a math worksheet or facts from a textbook and seemingly “know” the content. However, a student is typically unable to translate this into real life application or in a different academic setting. For example, Student A has good memory and was able to memorize the process of the activities rather than the actual spelling concepts; making him appear proficient but unable to fully transfer them to other subjects. Similarly, Student C’s appeared to understand concepts quickly; however, he was truly only memorizing the steps of the activities. Student C would complete a picture sort with me on Monday and Tuesday. By Wednesday, it seemed as if he understood the week’s spelling feature; however, when asked to hunt for words or blend and extend, I began to see him struggle.

Overall, I was concerned with my student’s ability to spell during “*Words Their Way™*,” time, but not have an ability to translate those skills to other content areas. Word hunts and blend

and extend activities are two of many *Words Their Way™* activities not completely mirroring the word sorts, but focusing on the same concept. By mixing up the type of activity, it allowed me to determine if students truly understood the concept or if they memorized the process. The repetition of the spelling feature throughout the week in a variety of activities helped my students overcome the initial memorization of the activity's process and begin to memorize the spelling feature. This was evident in the weekly final assessments I conducted with each student through a "blind sort" where students are dictated the week's words and asked to spell and sort them in their journals. Each week, every student correctly sorted the words into their specific categories. They could correctly spell the target feature for the week (ex. digraphs sh-/ch-/th-), as well as some of the words as a whole.

Auditory Processing. One theme I found in my observations was the issue with auditory processing and its translation to spelling and reading of words. Many students with autism experience issues with language, as it presents itself in one way or another. Words a student cannot pronounce typically contain more advanced speech patterns, resulting in incorrect sorting of words within the program. For example, Student C presents abnormal speech patterns often translating to his spelling and reading errors. When conducting running records with him, errors made closely mirrored his typical speech patterns. Student C made errors with his ability to pronounce words. Many times throughout the six-week period, I noted Student C would confuse the sh- and ch- digraphs. Initially, I assumed it was because of a new concept; however, I began to notice certain words he pronounced correctly, he would be able to sort correctly. Words he could not pronounce, typically containing more advanced speech patterns, he would repeatedly sort incorrectly. I worked on this a great deal with Student C, making him repeat the sounds and blend them, look at the spelling of them, compare words with the same and different sounds.

Regardless of the tactic I took, Student C would continuously repeat the words incorrectly, indicating he was unable to decipher differences in how they sounded. Through significant repetition, Student C was able to correct some of the errors, but it was evident this issue would persist throughout the *Words Their Way*TM program, requiring intensive intervention from both the speech pathologist and myself.

Student E presents abnormal speech patterns often translating to his spelling and reading errors. When conducting running records with him, errors made closely mirrored his typical speech patterns. Student E made errors closely resembling his issues with grammar and pronunciation of words. When reading, he often inserts and omits words, maintaining the meaning of the text, but changing it to the way he typically says the sentences.

Concrete Thinking. Throughout the six-week period, I noticed my students were consistently having difficulty completing tasks requiring abstract thinking, resulting in high levels of frustration, disengagement and decreased motivation. Students with autism think extremely concretely, having difficulty when presented with abstract concepts. Throughout the *Words Their Way*TM program, students create pictures of words containing similar spelling features and make up sentences using those words. These tasks were extremely difficult for every student in this study, and often resulted in frustration, refusal to complete the task, or concrete representations. Throughout my observations, I noted during the “draw and label” or “create a sentence” tasks, many students exhibited significant behaviors ranged from task refusal and head banging to physical and verbal aggression. Initially, I attributed this to environmental factors such as peers having issues, or exhaustion from the day. However, through constant comparative data analysis, a trend developed and showed these two tasks specifically caused maladaptive behaviors. As the experiment progressed, I found frustration was due to my

students' inability to think "outside the box." When asked to use words within a sentence or retell a story, Student A became distressed and would begin hitting his head; an indication of frustration and disengagement with the program. When asked to draw pictures of words we were not already using for the week's sort, each student consistently drew pictures that were already part of the week's sort. Student B had minor difficulty with abstract thinking tasks such as this. Because he has proficient expressive language skills, his ability to create sentences was greater; however, he did have difficulty with creativity and constructed simplistic sentences. Similarly, Student E is capable of expressing himself verbally; however, thinking creatively and verbalizing his thoughts is extremely frustrating for him. Many times, tasks of this nature would immediately anger him and result in maladaptive behaviors. To help combat this, I began creating a number of sentences containing spelling features for each developmental stage and asking students to circle the word containing the feature. By doing this, I eliminated the stressor of thinking abstractly, but continued to work on the feature of the week.

Expressive Language Limitations. One of the biggest issues I found throughout all of the data collection was the limitation some students had with expressive language. Of the five students, only two have expressive language skills. The other three typically provide one-word answers, repeat what is said to them, or repeat a key word from something said to them. For example, when Student D was asked, "What is this story about?" a typical answer would be, "about." Because of this, interview data, comprehension data, and some of the *Words Their Way™* data is incomplete, as I was unable to collect true answers from these students. For example, when asked questions about their feelings in the interviews, a typical answer from Students C and D were "good" or "yes" providing me with no real insight. Because of the limitations, activities such as "create a sentence" or "draw and label" were difficult for them to

complete. I was unable to truly assess their comprehension of passages, as they would typically provide me with one word answers or letters a-d.

Expressive language is essential to assessment of student ability; however, possible alternative assessments exist. Providing the student with choices rather than them verbally answering is one method I used a great deal. I would visually or verbally give them two or three choices and have them pick the answer, which eliminated frustration on their part and confusion on mine. I reworded questions so answers were “yes” or “no” to eliminate stress and confusion.

Modifications and Adaptations

Because this study consisted of a special population of students, I had some concerns using the *Words Their Way*TM program with students with autism. Many times throughout the study, I found it necessary to make modifications and adaptations to the lessons in order to maintain student engagement and lower stress and frustration.

As previously discussed, some of the modifications were necessary due to issues with concrete thinking and expressive language limitations. To combat issues with concrete thinking, I modified the task, targeting the same skills, but requiring the student to complete the task in a different way. Creating sentences caused frustration I deemed unnecessary. I was able to assess their understanding of the week’s spelling features in the same way by creating sentences and having them search for the features. Similarly, I constantly reworded questions to gain a broader understanding of student knowledge. Typically, Students A, C, and D answer questions with “yes” or “no” or repeat a key word within the question asked. In order to get a better understanding, I provided them with choices and simplified questions to reduce unnecessary stress.

Based on my observations, I concluded some of the tasks were too over stimulating to students, specifically the emergent assessments and the word sorts. When assessing Student D, I had to revise the assessment by writing letters in isolation on a dry erase board rather than pointing to each letter listed on the assessment page. At times, the word sorts became overwhelming to my students, due to the amount of words or pictures to sort. I revised this activity by handing the pictures or words to the student one at a time to reduce overstimulation. Another concept of the program requiring differentiation and adaptation was the abstract tasks, a requirement students with autism have a great deal of difficulty doing. Throughout the study, I found these tasks induced high levels of frustration and lack of engagement. In order to combat this obstacle, I was required to revise the tasks in order to maintain engagement and reduce frustration.

Bear et al. (2012) explain that picture sorts are typical within the emergent and letter-name alphabetic stages because concentration is on phonemic awareness. While I agree with this, I believe providing experiences with text-picture associations are important for literacy development for students with disabilities. Dorrell (n.d.) states in order to promote literacy development, the environment students are in should constantly expose them to a variety of print. Simple exposure to text-picture associations allows students to gain experiences with the text, while the focus is still on the picture. A balance between the two could contain a picture on one side and its label on the other, allowing the student to explore the picture as Bear et al. (2012) suggest, but allowing students to experience print as Dorrell suggests.

Varied Levels of Motivation, Engagement, and Attitude

Through observations, initial and final student interviews, and student work, levels of motivation, engagement, and an overall attitude towards literacy became evident for each

student, possibly playing a role in their academic progress. Overall, motivation, engagement, and attitude varied a great deal with each student each day. Environmental, emotional, and medical factors frequently played a significant role in their ability to complete tasks quickly and accurately. While this is typical for all students, those with autism react more intensely to changes; therefore, their academic progress can potentially suffer. This temperamental nature requires differentiation, adaptation of tasks, and flexibility within student schedules; something a self-contained private special education school allows.

Motivating/Engaging Factors. Throughout the study, the activities within the *Words Their Way™* program typically kept the students engaged due to the hands-on, multi-modal, and differentiated nature. Students often perceive the tasks as fun, presented in a game-like nature. The students were used to the expectations and general format, making it easy to complete, but engaging as well. However, if the tasks were too easy, engagement decreased. In addition, other issues can play a role in disengagement, such as issues with handwriting leading to frustration. Several times, I would have to discuss the benefits of practice and literacy with Student E, as he would become frustrated easily.

Student B is high functioning and thoroughly enjoyed the *Words Their Way™* activities. Daily, he would ask me when he could complete the activities with me, indicating high levels of motivation and engagement due to self-confidence. When working with him, he often procrastinated and took a long time to complete tasks due to OCD tendencies; however, he was engaged throughout and happy to do each activity, typically due to the game and puzzle like nature.

Student C's motivation to complete tasks varied depending on the type of day he was having. If he was able to focus and his medication levels were accurate, he would complete the

tasks with accuracy and little need for redirection. However, if he was unfocused, it was extremely difficult to get him to complete tasks in a reasonable period, regardless of external motivators. Similarly, when motivated to complete the lesson, Student D enjoyed and excelled at the picture sorts as well as reading the passages for each week's concept sort. However, Student D did not like having to write, often refusing or breaking the crayons, as his dexterity and handwriting abilities are limited and writing tasks frustrate him.

Needs for External Motivation. Students with autism are literal and visual thinkers; therefore, external incentives typically motivate them to complete the task for the preferred item or activity. Students D and E required significant motivation to complete activities, typically an incentive. Many times, desired activities such as lunch or snack scheduled after the task would ensure students would complete the task before moving on. I often used physical and verbal redirection to regain attention to tasks.

Throughout the initial running record assessments, Student E required a great deal of encouragement to complete the readings. As this was an initial assessment to determine a reading level, the first two passages used were too difficult, making him angry and requiring breaks. Many times when reading, Student E would make careless errors with words he knows, showing a lack of engagement and motivation. Breaks and encouragement helped a great deal in this case. At the conclusion of the study, Student E's reading abilities seemed to have decreased. However, when completing the initial assessments, he was new to my classroom and willing to do work to please me. As the time passed, his behaviors increased and willingness to complete tasks decreased significantly. With Student E, over the six-week period, his medication changed, staff changed, academic expectations increased, and home visits occurred; all extremely detrimental to his success academically, as any small change results in changes in his behavior.

As evident with Students D and E, students with autism require various external motivators. When changes occur, regardless of the size or nature, their academic success can potentially suffer, as evident with Student E.

Overall, I found both positives and negatives to using the *Words Their Way*TM program with teenage boys with autism. Based on analysis of initial, final, and informal assessments of student work, students showed improvements in spelling, reading, and handwriting. In addition, I found that characteristics of autism could potentially become obstacles. Some of the characteristics include rote memory, thinking abstractly, obsessive-compulsive tendencies, auditory processing, and expressive language. In order to overcome these obstacles, modifications and adaptations to the program are necessary on an individualized basis. The program's hands-on, game-like nature helped maintain engagement; however, some of my students required significant external motivation to complete tasks. The *Words Their Way*TM program provided a differentiated curriculum, increasing my students' spelling abilities, but requiring additional modifications based on individual learning needs.

Chapter 5: Conclusions and Implications

The *Words Their Way*TM program offers students the opportunity to delve into the complexities of the written English language through a developmental and multi-modal format. This program enables teachers to assess and analyze student ability, group based on developmental stages, teach in an organized and engaging manner, and monitor progress made. The program not only provides in depth instruction for teacher implementation, but a plethora of resources and activities to use with students.

While completing a six-week study using the *Words Their Way*TM program with teenage boys with autism, I uncovered a wide variety of affects, both positive and negative. Within my

classroom, as described in Chapter four, student spelling, reading, and handwriting abilities showed improvement. I found many aspects of the Autism Spectrum Disorder could become obstacles for student learning.

The *Words Their Way*TM program differentiates through a developmental approach to learning spelling. It is extremely helpful because of its ability to help organize students based on developmental stages, as many classrooms host a wide variety of abilities. This program however was not created solely for use with students with disabilities, though it is helpful in special education classrooms. Students with autism are all unique in their learning, environmental, social, and physical needs; therefore, they all react differently to the *Words Their Way*TM program. For this reason, further differentiation, modification, and adaptation are necessary to ensure success of each student, as they all have unique needs.

Due to the level of need students with disabilities may have, it is necessary to consider their future when creating academic goals. Many students will typically move on to “day-habs” or homes for developmentally delayed individuals, where they complete simple tasks throughout the day. Because of the nature of their future jobs, we must consider the need for functional reading skills versus an ability to spell. Each decision is made on an individual basis, but typically, older students with autism will need more functional skills than literacy skills. Typically functional skills taught include basic sight words, environmental print, community signs, and filling out an application. While spelling is necessary, the depth which the *Words Their Way*TM program teaches spelling is not. In my experience, the *Words Their Way*TM program is effective but not practical for teenage boys with autism and significant disabilities, as the time left in school should be for functional skills. However, I believe the *Words Their Way*TM program is essential for younger students with autism, as it teaches them basic skills and fills the holes in

their literacy foundation. Once we fill the holes, their future academic endeavors could improve drastically.

Regardless of the issues with the program and necessity for it in my students' future, the program was successful and each student showed improvement in his ability to spell as well as read and comprehend texts. The results cannot be isolated to the *Words Their Way*TM program, as other word work and reading instruction was used throughout the six-week study as part of their typical literacy instruction. I believe there seems to be a strong correlation between spelling and reading and encourage future research to identify if the *Words Their Way*TM program truly helps improve reading abilities.

Throughout the six week study, I have gained a much more detailed understanding of spelling development and will continue to implement the program in my classroom. I have grown more confident in my ability to implement spelling instruction. I can advise colleagues, referring them to the program and coaching them in their initial implementation within their own classrooms.

References

- Abbott, M. (2000). Identifying reliable generalizations for spelling words: The importance of multilevel analysis. *The Elementary School Journal*, 101(2), 233-245.
- Al Otaiba, S., & Hosp, J. (2010). Spell it out: The need for detailed spelling assessment to inform instruction. *Assessment for Effective Intervention*, 36(1), 3-6.
- Bailet, L. (1990). Spelling rule usage among students with learning disabilities and normally achieving students. *Journal of Learning Disabilities*, 23(2), 121-128.
- Baio, J. (2014). Autism Spectrum Disorder (ASD). *Centers for Disease Control and Prevention*. Retrieved September 11, 2014, from <http://www.cdc.gov/ncbddd/autism/index.html>
- Bear, D. R., Invernizzi, M., Templeton, S., & Johnston, F. (2012). *Words their way: word study for phonics, vocabulary, and spelling instruction* (5th ed.). Upper Saddle River, N.J.: Merrill.
- Beirne-Smith, M., & Riley, T. F. (2009). Spelling assessment of students with disabilities: Formal and informal procedures. *Assessment for Effective Intervention*, 34(3), 170-177.
- Benchmark Passages & Running Records. (n.d.). Retrieved November 29, 2014, from <http://www.readinga-z.com/assessments/benchmark-passages/>
- Bruner, J. (1960). *The process of education*. Cambridge: Harvard University Press.
- Calhoun, M., Greenberg, D., & Hunter, C. (2010). A Comparison of standardized spelling assessments: Do they measure similar orthographic qualities? *Learning Disability Quarterly*, 33(3), 159-170.
- Centers for Disease Control and Prevention, (2002). *MMR Vaccine and autism (measles-mumps-rubella): Fact Sheet*.

- Chomsky, N. (1965). *Aspects of the theory of syntax*. MIT Press.
- Clark, V.P. & Creswell, J.W. (2010). *Understanding research: A consumer's guide*. Upper Saddle Ridge, NJ: Pearson Education.
- Clay, M. (1995). *An observation survey of early literacy achievement* (2nd ed.). Auckland, N.Z.: Heinemann.
- Darch, C., Kim, S., Johnson, S., & James, H. (2000). The strategic spelling skills of students with learning disabilities: The results of two studies. *Journal of Instructional Psychology*, 27(1), 15-26.
- Dewey, J. (1902). *The child and the curriculum*. Chicago: University of Chicago Press.
- Dorrell, A. (n.d.). Classroom labeling as part of a print-rich environment. Retrieved December 7, 2014 from http://www.earlychildhoodnews.com/earlychildhood/article_view.aspx?ArticleID=441
- Friend, M. (2011). *Special education: Contemporary perspectives for school professionals*. Upper Saddle River, NJ: Pearson.
- Gabig, C. (2008). Verbal working memory and story retelling in school-age children with autism. *Language, Speech, and Hearing Services in Schools*, 39, 498-511.
- Ganske, K. (2014). A Developmental Perspective. In *Word journeys: Assessment-guided phonics, spelling, and vocabulary instruction* (Second ed., pp. 7-26). New York City, NY: Guilford Press.
- Gardner, H. (2006). *Multiple intelligences: New horizons in theory and practice*. New York: Basic Books.
- Glaser, B., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.

Graham, S., & Santangelo, T. (2014). Does spelling instruction make students better spellers, readers, and writers? A meta-analytic review. *Reading and Writing, 27*, 1703-1743.

Hanser, G., & Erickson, K. (2007). Integrated word identification and communication instruction for students with complex communication needs: Preliminary results. *Focus on Autism and Other Developmental Disabilities, 22*(4), 268-278.

Harris, L.A. (2007). Adolescent literacy: Word study with middle and high school students. *Teaching Exceptional Children Plus, 3*(4)

Hubbard, R., & Power, B. (1999). *Living the questions: A guide for teacher-researchers*. York, Me.: Stenhouse.

Invernizzi, M., & Worthy, M. (1989). An orthographic-specific comparison of the spelling errors of learning disabled and normal children across four grade levels of spelling achievement. *Reading Psychology, 10*(2), 173-188.

Johnson, P., & Keier, K. (2010). *Catching readers before they fall supporting readers who struggle, K-4*. Portland, Me.: Stenhouse.

Kanner, L. (1943). Autistic disturbances of affective content. *The Nervous Child, 2*, 217-250.

Learning A-Z's Benchmark Passages (nd). *Benchmark passages & running records*. Retrieved from <http://www.readinga-z.com/assessments/benchmark-passages/>

Loeffler, K. A. (2005). No more Friday spelling tests? An alternative spelling assessment for students with learning disabilities. *TEACHING Exceptional Children, 37*, 24-27.

Lyons, C. (2003). *Teaching struggling readers: How to use brain-based research to maximize learning*. Portsmouth, NH: Heinemann.

Martin, L. (2009). *No Paraprofessional Left Behind (NPLB): The changing role of paraprofessionals in an inclusion classroom*. AZ: ProQuest LLC.

- McGee, L., & Richgels, D. (2012). *Literacy's beginnings: Supporting young readers and writers* (6th ed.). Boston: Pearson.
- McGuffin, M.E., Martz, S.A., & Heron, T. E. (1997). The effects of self-correction versus traditional spelling on the spelling performance and maintenance of third grade students. *Journal of Behavioral Education, 7*(4), 463-476. doi:10.1023/A:1022807402418
- McNeill, B., & Kirk, C. (2014). Theoretical beliefs and instructional practices used for teaching spelling in elementary classrooms. *Reading and Writing, 27*(3), 535-554.
- Mehta, P., Foorman, B.R., Branum-Martin, L., & Taylor, P.W., (2005). Literacy as a unidimensional construct: Validation, sources of influence, and implications in a longitudinal study in grades 1 to 4. *Scientific Studies of Reading, 9*(2), 86-116.
- Me read? No way: A practical guide to improving boys' literacy skills.* [Brochure]. (2004) Ontario, CA: Queen's Printer for Ontario.
- Moats, L. (2005). How spelling supports reading. *American Educator, 29*(4), 12-43.
- Morrow, L. (2012). *Literacy development in the early years: Helping children read and write* (7th ed.). Boston: Pearson.
- Narang, S., & Gupta, R. (2014). The effect of multimodal remedial techniques on the spelling ability of learning disabled children. *International Journal of Special Education, 29*(2), 84-91.
- National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects.* Washington, DC: Authors.
- National Institute of Neurological Disorders and Stroke. (2009). *Autism fact sheet.* Washington, DC: National Institutes of Health

Preparing America's students for success. (2014). *Common Core State Standards Initiative*.

Retrieved October 23, 2014, from <http://www.corestandards.org/>

Sayeski, K. L. (2011). Effective Spelling Instruction for Students with Learning Disabilities.

Intervention in School & Clinic, 47(2), 75-81. doi:10.1177/1053451211414191

U.S. Department of Education, National Center for Education Statistics. (2013). *Digest of*

Education Statistics, 2012 (NCES 2014-015), Chapter 2.

U.S. Department of Education, Institute of Education Sciences, National Center for Education

Statistics, National Assessment of Educational Progress (NAEP), various years, 1992–

2013 *Mathematics and Reading Assessments*.

Vaughn, S., & Bos, C. (2012). *Strategies for teaching students with learning and behavior*

problems (8th ed.). Upper Saddle River, N.J.: Pearson.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*.

Cambridge, MA: Harvard University Press.

Williams, D. (2008) What neuroscience has taught us about autism: Implications for early

intervention. *Zero to Three*, 28(4), 11-17.

Appendices

Appendix A: Initial Interview Protocol

1. What is your favorite thing to learn about? What is your favorite subject? Why?
2. Do you like reading? Why? Do you think you are good at it? Why?
3. Do you like writing? Why? Do you think you are good at it? Why?
4. Do you like spelling? Why? Do you think you are good at it? Why?
5. What kind of books do you like to read? What makes them good books?
6. Do you have any questions?

Appendix B: Final Interview Protocol

1. What is your favorite thing to learn about? What subjects do you like?
2. Do you like reading? Why? Did this change since we have been doing *Words Their Way* together? How?
3. Do you like writing? Did this change since we have been doing *Words Their Way* together? How?
4. Do you like spelling? Did this change since we have been doing *Words Their Way* together? How?
5. Do you feel like you got better in reading, writing or spelling? How so?
6. What was your favorite part of these lessons? Why?
7. What was your least favorite part of these lessons? Why?
8. Is there anything you would like to tell me?

Appendix C: Observation Protocol

1. Evidence of student engagement
2. Evidence of student motivation to complete tasks and learn
3. Questions asked by students
4. Evidence of frustration during activities
5. Overall gist of how the lesson went.

Appendix D: Weekly Schedule for Emergent Stage

Typical Weekly Schedule for <i>Words Their Way™</i>				
Emergent Stage				
Monday	Tuesday	Wednesday	Thursday	Friday
<p><i>Read To and talk with</i></p> <ul style="list-style-type: none"> • Read text • Have student repeat after you • Read it to them again <p>Word Sort:</p> <ul style="list-style-type: none"> • Introduce concept • Tell him what each picture is. • Discuss categories • Model the sort • Sort the pictures 	<p><i>Read To and talk with:</i></p> <ul style="list-style-type: none"> • Read text • Have student point to each word as it is read • Read it to them again <p>Word Sort:</p> <ul style="list-style-type: none"> • Reintroduce the concept • Tell him what each picture is. • Sort the pictures based on categories <p><i>This should be done with less help</i></p> <p>Books:</p> <p>Look at books and find words that pertain to the sort in them</p>	<p><i>Read To and talk with:</i></p> <ul style="list-style-type: none"> • Read text • Have student point to each word as it is read • Have him try to read the words • Read it to him again <p>Word Sort:</p> <ul style="list-style-type: none"> • Reintroduce the concept • Tell him what each picture is. • Sort the pictures based on new categories 	<p><i>Read To and talk with:</i></p> <ul style="list-style-type: none"> • Read text • Have student point to each word as it is read • Have him try to read the words • Read it to him again <p>Draw and Label:</p> <ul style="list-style-type: none"> • Have him find things around the room/school that fit into the category. • Have him draw a picture of them and label it (spelling does not matter) <p>Word Sort:</p> <ul style="list-style-type: none"> • Reintroduce the concept • Tell him what each picture is. • Sort the pictures based on new categories 	<p>Word Sort:</p> <ul style="list-style-type: none"> • Reintroduce the concept • Tell him what each picture is. • Sort the pictures based on new categories <p><i>Read To and talk with:</i></p> <ul style="list-style-type: none"> • Read text • Have student point to each word as it is read • Have him try to read the words by himself • Pick random words and ask him to identify them

Appendix E: Weekly Schedule for Letter-name Alphabetic Stage

Typical Weekly Schedule for <i>Words Their Way™</i>				
Letter-Name Alphabetic Stage				
Monday	Tuesday	Wednesday	Thursday	Friday
<p><i>Picture sort</i></p> <ul style="list-style-type: none"> • Use black mat and specified sorts • Model the sort and explain • Have student sort the pictures based on letters in the sorts • Talk about the sounds 	<p><i>Word sort</i></p> <ul style="list-style-type: none"> • Complete the word sort with limited help <p><i>Build, blend, extend</i></p> <ul style="list-style-type: none"> • Using flash cards, build the word using onset and rime • Blend the two flashcards • Have student write them down and think of other words that start with onsets 	<p><i>Word sort</i></p> <ul style="list-style-type: none"> • Complete the word sort with limited help <p><i>Drawing and Labeling</i></p> <ul style="list-style-type: none"> • Do the same picture sorts as yesterday • Use the letters in the sort and have student think of other things that begin with the same letter • Have the student draw the picture and label it (don't help with spelling) 	<p><i>Word sort</i></p> <ul style="list-style-type: none"> • Complete the word sort with limited help <p><i>Word Hunts</i></p> <ul style="list-style-type: none"> • Read a book with the student and have them point out words with the same sounds as they have been working on all week • Have student add them to their notebook • Can do around the classroom or school 	<p><i>Word sort</i></p> <ul style="list-style-type: none"> • Complete the word sort with no help <p><i>Blind Sort:</i></p> <ul style="list-style-type: none"> • Have the student write the categories in their notebook • Dictate the words to them and have them sort them accordingly

Appendix F: Weekly Schedule for Syllables and Affixes Stage

Typical Weekly Schedule for <i>Words Their Way™</i>				
Syllables and Affixes Stage				
Monday	Tuesday	Wednesday	Thursday	Friday
<p><i>Word Sort:</i></p> <ul style="list-style-type: none"> • Introduce concept • Have them read the words • Discuss categories • Model the sort • Sort the pictures 3x 	<p><i>Word Sort:</i></p> <ul style="list-style-type: none"> • Reintroduce concept • Have them read the words • Discuss categories • Sort the pictures <p><i>Writing Sort:</i> Have students copy their word sorts into their notebooks</p>	<p><i>Word Sort:</i></p> <ul style="list-style-type: none"> • Reintroduce concept • Have them read the words • Discuss categories • Sort the pictures <p><i>Illustrate/use in a sentence:</i></p> <ul style="list-style-type: none"> • <i>Draw pictures for each word or use it in a sentence</i> 	<p><i>Word Sort:</i></p> <ul style="list-style-type: none"> • Reintroduce concept • Have them read the words • Discuss categories • Sort the pictures <p><i>Word Hunt:</i> Look for words around the room, in the school, or in their books that follow the same patterns</p>	<p><i>Blind Sort:</i></p> <ul style="list-style-type: none"> • Have the student write the categories in their notebook • Dictate the words to them and have them sort them accordingly

Appendix G: Study's 6-week schedule for each stage

Study Overview						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Emergent Stage	-Assessments and introduction to procedures and expectations - Concept sort (fruits)	Concept sort (shapes)	Concept sort (animals and plants)	Concept sort (clothing)	Concept sort (cleaning)	Concept sort (foods) -Assessments
Letter-Name Alphabetic Stage	-Assessments and introduction to procedures and expectations -Review initial and final consonants	S, h, sh digraphs	C, h, ch digraphs	H, sh, ch digraphs	Th, wh digraphs	Sh, ch, th, wh digraphs -Assessments
Syllables and Affixes Stage	-Assessments and introduction to procedures and expectations -Review inflected endings	Compound words	More compound words	Syllable juncture in VCV and VCCV patterns	More syllable junctures in VCV and VCCV patterns	Syllable junctures with VCV and VVCV patterns -Assessments