EFFECTS OF A PARAPROFESSIONAL-IMPLEMENTED VIDEO SELF-MODELING AND SYSTEM OF LEAST PROMPTS INTERVENTION ON COMPLETION OF TRANSITIONAL ROUTINES FOR A STUDENT WITH EXTENSIVE SUPPORT NEEDS IN INCLUSIVE SETTINGS

by

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A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Special Education

Charlotte

2020

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ABSTRACT

ELIZABETH NICOLE REYES. Effects of a Paraprofessional-implemented Video Self-modeling and System of Least Prompts Intervention on Completion of Transitional Routines for a Student with Extensive Support Needs in Inclusive Settings. (Under the direction of DR. CHARLES L. WOOD)

Students with extensive support needs (ESN) often require repeated individualized instruction across a range of instructional domains. Research suggests that students with ESN can learn greater independent skills when evidence-based practices (EBPs)m are used to teach independent transitioning skills. This study investigated the effects of a paraprofessional-implemented video self-modeling (VSM) and system of least prompts (SLP) intervention on independent completion of transitional routines for a student with ESN in inclusive settings. Results showed a functional relation between the VSM + SLP intervention and independent completion of transitional routines. Additionally, the paraprofessional received Behavioral Skills Training (BST) and implemented the VSM + SLP intervention with high fidelity. Moderate levels of generalization of independent transitioning skills for transitional routines were observed. The findings of this study provide several implications for practice for using VSM + SLP as a combined intervention to increase independent transitioning skills for students who previously relied on adult assistance to make transitions alongside general education peers.

DEDICATION

First, I dedicate this dissertation to the children with disabilities and their families who inspire me every day to do better for them and to impact the world in a way that will do right by them. It is through our continued interactions that I am reminded of why I do this work. God has put a purpose on my life to improve the outcomes for individuals with disabilities and I will continue to strive to fulfil that calling in my teaching and research career.

Second, I dedicate this dissertation to the people in my life who made this dream possible. They say "it takes a village," and I have had the best village supporting me throughout this process. My village is too large to name everyone individually, but to anyone who has watched my children, fed my husband, met with me for dinner, or answered my call when I needed you most…thank you. I cannot begin to express my appreciation for wonderful people I am blessed to know and who choose to love me through it all.

Lastly, this dissertation is dedicated to my wonderful husband and our two children. Edward, you are simply made of gold and the perfect partner to make this dream a reality. You have done nothing but support me through this process in your thoughtful words, helpful actions, and steadfast love. To my beautiful Eleanor, you are my best girl. I hope to inspire you the way you have inspired me. To my precious Ellington, you were a wonderful gift this year. I hope to make you proud as you have made me. I love you all immensely as you ground me and remind me every day what is most important in life… Love.

ACKNOWLEDGEMENTS

First, I want to acknowledge my committee members. I appreciate the encouragement and support you have provided to me over the course of my time in the doctoral program and during my dissertation phase. To Dr. Charles Wood, I am grateful to have had the privilege of more than a decade of your mentorship. You have shown me the importance of caring for people while still expecting excellence, a fine balance that I seek to replicate in my teaching and research career. To Dr. Virginia Walker, I thank you for the feedback and support you have given me in the design and implementation of my dissertation research. Your work ethic and attention to detail are greatly motivating. To Dr. Kelly Anderson, thank you for your candor and concern for me throughout the years. Your passion and enthusiasm for your work inspires me always. To Dr. Sejal Foxx, thank you for your willingness to come along side me in this dissertation year of research. I am grateful for your knowledge and expertise.

I would also like to thank the faculty of the doctoral program and other faculty members of the Cato College of Education. In my time at UNC Charlotte since 2006 I have grown to know many of you very well. I hope to be a proud reflection of all the hard work and dedication the faculty has put into the special education program. I thank you all for guiding me in my development from an undergraduate college student through now as a doctoral graduate. This doctoral program has modeled for me a level of collaboration and synergy that I will always look for in future work environments. Thank you to my colleagues from my cohort, as well as the ones before and after; we are forever bonded by our wonderful experiences as UNC Charlotte doctoral students. Your friendship and support have kept me going even in the toughest times.

Next I would like to acknowledge my family. Thank you to my mother, Diana Halstead, who instilled in me at a young age the importance of education. You helped me get to where I am and you always find the right words to say to keep my chin up when I experience self-doubt. Thank you to my brother, Stephen Halstead, for always being there for me and encouraging me every step of the way. Your unconditional love and genuine happiness for others is a gift. Thank you to my late father-in-law, Omar Reyes, for always wanting to hear about my latest schooling and career endeavors. You took interest in my drive and always encouraged me to go for it. I miss your sound advice and rational thinking. Although you are not here to see the end of this dissertation journey, I know you are beaming from Heaven like a proud father would. To my mother-in-law, Diana Reyes, thank you for being a rock for me and my family through these trying years. You have the purest heart and I am so lucky you share your love so graciously. Making you all proud means the world to me.

Finally, thank you to my one and only, my husband Edward. Thank you for all the sacrifices you make so I can follow my dreams. You have carried me through three degrees at UNC Charlotte, our alumni and where we met. When I look at this wonderful life God has given us, I can’t help but pinch myself to think how lucky we are. As the parents of two very loved children, Eleanor and Ellington, I can’t wait to see where this life takes us next. Always with you by my side, I will go anywhere with you.

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CHAPTER 1: INTRODUCTION

Statement of the Problem

Decades ago, children with disabilities were excluded from access and participation in educational settings within schools. The focus in education has shifted towards educating all children in public schools. This shift is apparent in language used in the following titles of laws that have been passed over the past few decades: Education for All Handicapped Children Act (EAHCA, 1975), No Child Left Behind Act of 2001 (NCLB, 2002), Individuals with Disabilities Education Improvement Act (IDEA; 2004), and Every Student Succeeds Act (ESSA, 2016). These laws have been put into action and funded in order to improve outcomes for students, including students with disabilities. In the 40th Annual Report to Congress on IDEA, more than half (63.1%) of all students with disabilities were reported as being served 80% or more of their day in the general education setting. Recent examinations of state and national trends in educational placements showed that although students with high-incidence disabilities have gained access to less restrictive environments overtime, students with low-incidence disabilities or extensive support needs (ESN [i.e., autism spectrum disorder, intellectual disability, multiple disabilities]) do not show as great of an increase in time spent in general education classrooms over time (Kurth et al., 2014; Morningstar et al., 2017). Data show students with low-incidence disabilities are continually disproportionally represented in self-contained and more restrictive settings (Kleinert et al., 2015; Kurth et al., 2014; Morningstar et al., 2017, Smith 2007).

Students with Extensive Support Needs

Historically, students with ESN have not been given equally appropriate, accessible, and meaningful opportunities to learn in inclusive educational settings (Taub et al., 2017; Ryndak et al., 2013). Students with ESN are those who "require the most support to learn, often categorized as having intellectual disability, multiple disabilities, autism spectrum disorders (ASD), or related disabilities" (Kurth et al., 2018b, p. 143). Students with ESN are characterized as individuals who require repeated individualized instruction across academic, behavioral, and/or social skills, and who benefit from substantially adapted materials with differentiated methods of assessment to evaluate skill acquisition and transference of skills across settings (Kleinert et al., 2015).

Inclusion of students with ESN

Even though legislation supports the education of all students, including those with ESN, these students often are not included in general education classrooms due to requirement of extensive supports needed to fully participate in the general educations setting and/or lack of staff support needed to be successful in an inclusive setting (Kleinert et al., 2015; Morningstar et al., 2017). Another major barrier to the inclusion of students with ESN is that both general and special education teachers report they do not feel prepared by preservice coursework and experiences prior to teaching a student with ESN in a general education classroom (Zagona et al., 2017). Further, teachers identify communication and collaboration as challenges due to the limited amount of planning time allotted for coming together as a team to plan modifications to lessons and activities in the classroom (Able et al., 2015; Zagona et al., 2017). Although there are many barriers to inclusion, successful inclusive settings can work when there are several

common features, such as (a) appropriate accommodations and adaptations to curriculum materials, (b) a culture of belonging, (c) common planning time for professional collaboration, and (d) regular engagement with peers without disabilities (Kurth et al., 2015). Increasing the independent skills of students with ESN in general education classrooms can reduce barriers to engagement with the class and decrease reliance on additional staff to assist with communication, behavioral, and/or academic supports.

Due to the intensity of these students' needs, those who do participate in the general education classroom are often assigned a paraprofessional to assist them for all or most of their time in the inclusive classroom and to travel with them throughout the school building (Giangreco et al., 1997). Although paraprofessionals serve many valuable roles for students with ESN, there are inadvertent detrimental effects on the students they serve due to the intimate level of support they are directed to provide (Giangreco et al., 2005). Paraprofessional support in place of student independence is a problem for a few reasons. First, students with disabilities become prompt dependent on the paraprofessional and may not respond to typical prompts in the general education classroom from the general education teacher (Giangreco & Broer, 2005). This also causes an interference with ownership and responsibility for which general education teachers feel accountable (Giangreco et al., 1997). Often times, a general education teacher may be more hesitant to take a lead role or even address the student with ESN directly within the classroom because he/she might view the paraprofessional as the person who should be interacting with the student with ESN, modifying assignments, and assigning grades (Giangreco et al., 2001; Giangreco et al., 1997). Second, students with disabilities become isolated from their peers due to the stigma of having extra adult

assistance in the classroom (Giangreco et al., 1997, 2005). Last, paraprofessionals are often the least trained in using evidence-based practices (EBPs) with students with disabilities, but are the ones providing the most extensive support on a daily basis (Brock & Carter, 2015). It is evident that interventions for students with disabilities in inclusive settings need to reduce the interfering roles of paraprofessionals so these students may gain independence to take direction from general education teachers, and increase peer acceptance through the use of EBPs (Ryndak et al., 2009).

Paraprofessional Roles for Students with ESN

Outcomes for students with ESN will remain dismal if training for all individuals working with this population is not made a priority (Ruppar et al., 2018). Paraprofessionals continue to be paired with students with ESN despite having limited education to adequately prepare them for their roles in supporting students with ESN (Carter et al., 2009; Walker & Smith, 2015) and proper training prior to fulfilling important supporting roles (Giangreco et al., 2010). The sheer presence of special educators to paraprofessionals shows that paraprofessionals far outnumber the number of special educators per child in the United States (40th Annual Report to Congress on IDEA, 2019). Of the population of students with disabilities receiving special education services, students with ESN are most likely to receive paraprofessional support and often these are one-on-one arrangements (Carter et al., 2009). The responsibilities related to access and participation in the general education setting often rests on paraprofessionals who support students with ESN inclusive settings. Schools districts are staffed heavier on the side of paraprofessionals because they are more cost effective to hire and still count towards ratio counts for supporting the needs of supporting students with ESN

(Giangreco et al., 2010). Paraprofessionals are often asked to do more than assist a student with personal needs or assist special education teachers with clerical needs (Etscheidt, 2005), but rather these individuals are often asked to implement instruction and skills training in classrooms (Brock & Carter, 2013). In the area of EBPs, there is a strong need for training paraprofessionals to deliver EBPs to students with ESN. Currently, there is minimal research showing effective training models or effective implementation of EBPs by paraprofessionals with students with low-incidence disabilities (Brock & Carter, 2013; Yates et al., in press). Of the few studies exploring training models, the most promising came from a study by Toelken and Miltenberger (2012). The authors used a behavioral skills training (BST) approach (Parsons et al., 2012) incorporating systematic steps required for effective training, including (a) written instructions, (b) modeling, (c) rehearsal, and (d) feedback. The results from this study showed positive effects from using least-to-most prompting to teach a student with ASD to independently respond during an academic lesson in an inclusive setting. Studies like this one are rare and demonstrate the need for protocols for training paraprofessionals given that they are the individuals spending a significant amount of time with students with ESN.

Transitional Routines in Inclusive Settings

Students with ESN who have access to the general education setting are subject to the same parameters as other students in the classroom regarding time for transitions within a school day. Educators and students are asked to do more than ever with the same amount of time in the school day. There seems to be increased demand for instructional activities with less time for breaks. Because of this, efficiency in transitioning from one

task to another is critical to optimize instructional time (Guardino & Fullerton, 2014; Lee, 2006). Many students with disabilities require support to independently transition between classroom routines and activities (Hemmeter et al., 2008; Lequia et al., 2014). Hume et al. (2014) defined transitions as any time a child is changing from one activity to another. Hume and colleagues listed several types of transitions students with disabilities face every day in school, including transitions between staff, subjects, instructional formats, and transitions from one location to another. Often students with ESN, especially younger students, are seen holding the hand of a paraprofessional as he/she walks the student through the transitional steps in the task with maximum levels of verbal prompting (Giangreco et al., 1997). Students with disabilities can benefit from transitional supports that are not based on physical prompting to gain independence and avoid being ostracized by peers. Transition supports are defined as "any technique used to support students with a disability using changes in or disruptions to activities, settings, or routines" (Hume et al., 2014, p. 35). Transition supports can be used to help shorten the amount of time spent transitioning as a way to optimize the number of hours in a school day (Guardino & Fullerton, 2014). Practitioners need EBPs to promote effective transitions to move quickly between tasks and stay engaged in the next task without delay (Lee, 2006).

System of Least Prompts

During routine school transitions, students rely on teacher prompting to give initial directions, and students with disabilities often require frequent prompts to make transitions successfully. The system of least prompts (SLP) is an instructional strategy that is an established EBPs for students with ESN (Browder et al., 2014). When using

SLP, a specific stimulus is followed by a hierarchy of at least two prompt levels, with an opportunity to respond independently (Doyle et al., 1988). If the student responds correctly and independently, then reinforcement (e.g., praise) is delivered; however, if an error occurs, the student is given the least intrusive prompt and another opportunity to respond, moving up the hierarchy towards the most intrusive prompt until the student responds correctly and receives reinforcement again (Doyle et al., 1988). One of the benefits of using SLP is that it creates near errorless learning as the student gains more practice performing the target behavior correctly instead of repeating trials where the student is incorrect (Wolery et al., 1986). In a more recent review of SLP, Shepley et al. (2019) analyzed 123 peer-reviewed studies including 413 participants, and found that over half (53%) of studies were conducted in school settings. Additionally, this review suggests that SLP is most effective for use with chained tasks (sequential steps) rather than discrete tasks (one step) and many studies reported overall decreased error rates with the use of SLP.

Technological Supports

Although low-tech solutions have existed for students with ESN for decades, high-tech options are becoming increasingly available as a way to support these students towards reaching their goals. Assistive technology has been well researched for use with students with disabilities (Alper & Raharinirina, 2006); however, instructional technology is gaining more attention in the field of special education. Assistive technology refers to technology that gives access to represent or express communication, while instructional technology is used to teach a new skill through the use of visual and audio components (Ayres et al., 2016). Also, the rapid development of technology causes

the field to constantly reevaluate the effectiveness of newer technologies as they are created. The use of technology has the potential to bridge the gap between prompt dependence to independence in general education classrooms (Ayres et al., 2013). Despite the benefits of using assistive technology for students with disabilities, these supports are not always optimized, especially in inclusive settings. This may be due to the general education teacher, paraprofessional, and/or special education teacher not having access to the technologies or not having the proper professional development in how to use available technologies (Okolo & Diedrich, 2014).

Video Modeling

Prior data-based studies have supported the use of technology to teach students with disabilities (Alper & Raharinirina, 2006; Ayres et al., 2013; Okolo & Diedrich, 2014). Specifically, video modeling and video prompting have been used to teach a variety of skills, such as social, daily living, and academic skills (Norman et al., 2001; Park et al., 2018). Video modeling has been identified as an evidence-based practice for students with ASD focused on providing a visual model of the desired behavior via video recording and playing back recordings to assist learning a desired skill or behavior (Wong et al., 2015), as well as with students with severe disabilities (i.e., ESN; Browder et al., 2014). Video models can be useful in helping students with disabilities initiate, maintain, and generalize skills across learning environments (Carnahan et al., 2012). Video modeling is a strategy that is convenient and noninvasive for parents and teachers because recorded videos can be made quickly and easily on mobile devices and replayed or edited as a non-invasive intervention for teaching targeted behaviors (Banda et al., 2007; Dowrick, 1999). Video models can be presented in two main formats: video self-

modeling (VSM) and video modeling with others as model (VMO), with research showing minimal differential effects between the two types (Mason et al., 2013). There are several steps that must be completed prior to starting a video modeling intervention. Hall et al. (2017) described the implementation steps for video modeling as: (a) identify a target behavior or skill the learner needs to be taught, (b) prepare the video equipment prior to recording, (c) plan the video recording session by setting up a time and environment without distractions, (d) collect baseline data, (e) create the video, (f) arrange the environment to watch the video, (g) show the video, (h) monitor the progress, (i) troubleshoot if the learner is not making progress, and (j) fade the video prompting. When created with attention to detail and fidelity, video modeling has the potential to improve students' ability to make transitions more independently (Hall et al., 2017).

Due to the influx of technology in schools, many students with disabilities are comfortable using touch-screen devices such as iPad® (Stephenson & Limbrick, 2015). Video modeling requires the following two basic skills from the student engaging with this technology: to click play and to attend to the screen by looking while the video is playing. Video modeling can be implemented by adults to increase students' independence, engagement, and correct performance of regular classroom routines in inclusive settings (Browder et al., 2014; Park et al., 2018). The SLP can be faded over time to decrease high levels of prompt dependence (Browder et al., 2014). Used in conjunction, these strategies can increase independence in general education classrooms for students with disabilities.

Limitations of Previous Studies

Although the previously reviewed studies show positive effects for students with ASD through the use of video modeling, these studies are limited in number and few were implemented within the general education classroom specifically focusing on transitional routines throughout the school day. The majority of research has focused on the effects of video modeling in special education settings such as resource rooms with a lower teacher-to-student ratio and only classmates with disabilities (Hart & Whalon, 2012; Spriggs et al., 2015). Many studies in the literature review on video modeling for students with ASD by Ayres and Langone (2005) and a meta-analysis conducted by Bellini and Akullian (2007) have also shown positive effects of video modeling and VSM in self-contained or small classrooms, but few were conducted in general education classrooms. Of the studies using VSM, only two have been found to also incorporate the SLP. Cihak et al. (2010) evaluated the efficacy of video modeling delivered via a handheld device (video iPod®) and the use of the SLP for four students with ASD making transitions throughout the school building. A single-case ABAB withdrawal design was used to analyze the percentage of independent transitions before and after the implementation of video modeling paired with the SLP. Results showed all participants were able to transition more independently after the intervention was introduced and the performance decreased when the intervention was withdrawn. A functional relation was established between video modeling and number of independent transitions students with ASD made between locations in a school. Results show video modeling through portable technology can aid students with ASD make transitions to and from locations in the school building; however, it did not show the effects of video modeling on within-

classroom transitions. A more recent study by Reyes et al. (2020) showed the combination of VSM + SLP to increase independence in completing transitional school routines for a student with ESN in an inclusive classroom. Using a single-case multiple-probe across behaviors design to evaluate the percentage of independent steps completed in each transitional routine following a VSM + SLP intervention, the researchers showed the participant was able to transition more independently within the general education classroom after the intervention was introduced. A functional relation was established and results showed that VSM can be paired with the SLP to increase independent transitioning skills of a student with ESN in an inclusive classroom based on typical transitions seen in lower elementary classrooms. Nevertheless, these studies are limited in sample size and more studies are needed to establish VSM + SLP as a combined EBP. Research is needed to determine the best practices for implementing video modeling in inclusive settings to address demands of larger classrooms involving multiple transitions between activities within the classroom and between locations in the school. Specifically, more research is needed to show paraprofessionals can be trained to implement EBPs for students with ESN. Research is needed in this area because paraprofessionals are often the personnel who spend the most time supporting students with ESN in the general education classroom. The current body of research lacks support for specific paraprofessional-implemented interventions using VSM with SLP for students with ESN in inclusive settings for increasing independence through transitional routines. There is also no current research incorporating paraprofessional training and implementation fidelity of such an intervention.

Purpose of Study and Research Questions

The purpose of this study was to investigate the effects of a paraprofessional-implemented VSM + SLP intervention on completion of transitional routines for an elementary student with ESN in an inclusive setting. Specifically, investigating the effects of VSM via an iPad® paired with the SLP to increase independent transitions and decrease duration of transitions between activities. This study also investigated the effect of using BST to train a paraprofessional to deliver VSM + SLP. Another purpose of this study was to determine the social validity of using VSM + SLP as an intervention to facilitate independent transitioning in inclusive settings. The research questions to be answered in this study included:

1. What is the effect of a paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines for an elementary student with ESN in an inclusive setting?
2. What is the effect of a paraprofessional-implemented VSM + SLP intervention on the duration of transitional routines for an elementary student with ESN in an inclusive setting?
3. Following BST, to what extent can a paraprofessional deliver the VSM + SLP intervention with procedural fidelity?
4. To what extent is an elementary student with ESN able to generalize the acquired skill of completing transitions independently in different inclusive locations within the school (e.g., lunch in the classroom vs. in the cafeteria) the use of VSM + SLP?

5. To what extent do the general education teacher, paraprofessional, and student rate the use of VSM + SLP as acceptable for facilitating independent transition in an inclusive setting for an elementary student with ESN?

Significance of Study

This study contributes to the literature on paraprofessional-implemented interventions of EBPs for students with ESN in many ways. First, this study investigates the use of BST for teaching paraprofessionals how to deliver interventions driven by EBPs with procedural fidelity. Researchers in special education have invested a significant amount of time and energy to identify EBPs to improve the outcomes for students with ESN; however, the potential benefits of such interventions are limited to the quality of implementation by the interventionist used. This study contributes to the work outlined by Cook and Odom (2013) calling for the need for implementation science as a way to help close the research-to-practice gap.

Next, this study adds to the work of Reyes et al. (2020) and Cihak et al. (2010) supporting the use of a combined package of EBPs (i.e., VSM + SLP) for improving independent completion of transitions for students with ESN between activities in the general education classroom and between locations in a school.

Video modeling has been well identified as an evidence-based practice (Browder et al., 2014; Dowrick, 1999: Wong et al., 2015); however, VSM as a type of video modeling has not been researched enough in isolation to be deemed as evidence based. Moreover, the existing research using VSM has not focused on the implications of use

with students with ESN in inclusive settings. This study contributes to the existing studies investigating the application of EBPs in inclusive settings for students with ESN.

SLP has a large body of research supporting its use with students with ESN for various academic, functional, daily living, communication, and behavioral skills (Browder et al., 2014; Doyle et al., 1988). Much of this research has focused on SLP as an isolated strategy, thus the field of special education is lacking research pairing SLP with other EBPs. This study adds to this body of research by combining SLP with VSM as a combined evidence-based practice intervention package.

Finally, this study adds to the small body of literature showing paraprofessionals as effective implementers of EBPs Research is desperately needed to fill the void for paraprofessional training for how to implement EBPs. Typically, special education teachers who support students with ESN remain in the self-contained classroom while the paraprofessionals attend outside classes and activities with students with ESN in the general education setting. Because paraprofessionals are often the staff who spend the most time with students with ESN in the general education classroom, it is a pressing issue that these individuals are properly trained to implement EBPs with fidelity.

By combining the work of Reyes et al. (2020) and Cihak et al. (2010), this study significantly adds to the research to support the use of VSM + SLP as a set of combined EBPs. More research is needed to investigate the effectiveness of which EBPs can and should be implemented as an intervention package, specifically as a paraprofessional implemented intervention package.

Additionally, this study also provides a practical solution for teachers and paraprofessionals who seek to support students with ESN in making independent

transitions within inclusive classrooms and other school settings. The results from this study also may impact areas of generalization from the classroom setting to the total school environment where students with ESN are more likely to be accessing inclusive settings.

Delimitations

It is important to recognize the delimitations of this study. First, this study used single-case design methodology with only one student participant. The low number of participants limits the generalizability of results to students with ESN. Results from this study only showed effects with the selected participant and further research will be required to determine if the effects can be replicated and are applicable to the larger population of students with ESN.

Second, this study was implemented in a small, private school with a low teacher-student ratio. The inclusive classroom where the study was conducted consisted of 10 second grade students, one of whom has ESN, and one paraprofessional with one general education teacher. This type of setting would be rare in most public schools where classroom sizes are much larger and have fewer assistants.

Third, this study used purposeful selection for identifying participants for this study. The participant was selected based on prerequisite skills related to making transitions during typical school routines. The participant was also selected based on adequate levels of hearing and vision, directional orientation or attention abilities in order to watch video models and hear prompting cues, and physical ability to complete each of the steps required in the transitions. Because of the selection of inclusion screening procedures, future replication might be challenging.

Lastly, the intervention combined the use of two EBPs in a multi-component intervention package, VSM + SLP, thus the effects from each practice cannot be singled out. This study did not remove parts of the multi-component intervention individually to measure the effects when just one was present because the lead researcher suspected there would be carry over effects from having been shown a VSM or been supported through a SLP. It cannot be determined through the current research design if one component of this intervention was more impactful than the other. It is also unknown whether the VSM or SLP would have been effective in isolation.

Definitions of Terms

Applied Behavior Analysis

Applied behavior analysis is the science in which principles of behavior are used to improve socially significant behavior (Baer et al., 1968, 1987; Cooper et al., 2020).

Behavior Skills Training (BST)

Behavior skills training is an evidence-based approach for training personnel to effectively implement behavior change and related strategies (Parsons et al., 2012, 2013). BST features a performance component in which the trainer and trainees demonstrate the focus skills and a competency-based component in which the training continues until the trainees perform the focused skills consistently (Parsons et al., 2012). The four central components of BST are verbal/written instructions, modeling, rehearsal, and feedback.

Evidence-based Practice (EBP)

Originating in the field of medicine (Odom et al., 2005), EBPs are teaching practices deemed effective through replicated scientific evidence supporting their effectiveness. The goal of using EBPs is to address the gap between research and practice

by utilizing implementation science to ensure procedural fidelity is followed (Cook & Odom, 2013).

Extensive Support Needs (ESN)

Students with ESN are those who "require the most support to learn, often categorized as having intellectual disability, multiple disabilities, ASD, or related disabilities" (Kurth et al., 2018b, p. 143). Students with ESN require repeated individualized instruction across academic, behavioral, and/or social skills, and who benefit from substantially adapted materials with differentiated methods of assessment to evaluate skill acquisition and transference of skills across settings (Kleinert et al., 2015). Other terms used to describe ESN include low-incidence disabilities and significant or severe disability.

Inclusive Setting

Inclusive settings are described as classrooms or locations in a school where students with disabilities attend for part or all of the day with a group of students in which the majority of students do not have disabilities (Downing & Peckham-Hardin, 2007; Theoharis & Causton, 2014). IDEA (2004) describes inclusive education in terms of the Least Restrictive Environment (LRE), or that "to the maximum extent appropriate, children with disabilities... are educated with children who are not disabled... Removal from the regular education environment occurs only when the nature or severity of the disability is such that education in regular classes with the use of supplementary aides and services cannot be achieved satisfactorily" (PL 94- 142, Section 1412 (5) (B)). Inclusion is access to the curriculum and instruction (Ryndak, et al., 2014); whereas, an inclusive setting is access to a general education setting/location.

Paraprofessional

Paraprofessionals are teacher assistants who work within a school to assist students with disabilities within the total school environment. Paraprofessional roles include helping students with disabilities with academic, social, behavioral, communication, and/or independent functioning skills. The 40th Annual Report to Congress on IDEA defines paraprofessionals as "employees who provide instructional support, including those who (a) provide one-on-one tutoring if such tutoring is scheduled at a time when a student would not otherwise receive instruction from a teacher; (b) assist with classroom management, such as organizing instructional and other materials; (c) provide instructional assistance in a computer laboratory; (d) conduct parental involvement activities; (e) provide support in a library or media center; (f) act as a translator; or (g) provide instructional support services under the direct supervision of a teacher (p. 37)."

Prompting

Assistance (indirect verbal, direct verbal, gestural, model, partial physical, full physical) provided to a student to help him/her acquire or engage in a targeted behaviors or skills (Cooper et al., 2020; Wong et al., 2015).

Reinforcement

Originating from B. F. Skinner's discovery of operant conditioning showing the behavior of an organism can change using a preferred stimulus that follows a desired response (Skinner, 1938). Each occurrence of the presentation of a preferred stimulus thereby increases the likelihood of a behavior occurring in the future.

Systematic Instruction

Originating from the principles of behavior analysis, systematic instruction has decades of research to support its effective in teaching discrete and chained skills across academic, social, employment, and daily living domains to individuals with moderate and severe disabilities (Collins, 2012; Snell, 1978, 1983). The application of systematic instruction seeks to create a structured learning that is well-defined and replicable by relying on performance data to inform instructional modifications during learning (Snell, 1983). Systematic instruction involves teaching targeted skills by using attentional cues, prompts, and specific consequences to promote skill acquisition throughout instructional trials. Systematic instruction is known to be most effective with students with low-incidence disabilities because these students typically require the explicit and repeated instruction through a specified, strategic approach (Collins, 2012).

System of Least Prompts

The system of least prompts is a strategy for transferring stimulus control from a discriminative stimulus to the natural stimulus by using a hierarchy of at least two prompts following each opportunity to respond. When an error occurs or if no response is made following the presentation of the target stimulus, the least intrusive prompt is delivered (e.g., gestural prompt) and an additional opportunity to respond is provided for the next step. This process continues until all of the prompts in the least-to-most hierarchy have been delivered or a correct response is made (Doyle et al., 1988).

Task Analysis

A task analysis involves breaking a complex skill into smaller, teachable units (Cooper et al., 2020). The purpose of using a task analysis is to make the teaching

process more manageable during skill acquisition (Wong et al., 2015).

Time Delay

Time delay is a strategy used to create errorless learning through a systematic stimulus transfer procedure used to facilitate learning (Snell & Gast, 1981; Touchette, 1971). During instruction a brief delay occurs between the instructions or prompts and the students' opportunity, allowing the student a chance to respond without assistance (Wong et al., 2015). Constant time delay is a form of time delay where the planned delay of time is consistent between each step in the teaching set or activity (Cooper et al., 2019). Time delay procedures are most effective when prompts are faded to increase independence.

Transitional Routines

Transitions occur any time a child is changing from one activity to another (Hume et al., 2014). Transitional routines are the activities that occur every day in the classroom or school with predictability in timing and steps needed to complete each that move students from one activity or location to another.

Video Self-modeling

Video self-modeling is an extension to video modeling, in which the student watches a video of himself/herself completing the targeted behaviors instead of watching someone else on the video (Dowrick, 1999).

CHAPTER 2: REVIEW OF LITERATURE

Following the legislative drive towards educating all students, including students with ESN (IDEA 2004; ESSA 2016), it is important that effective interventions are identified that can be implemented by various service providers, including paraprofessionals, to increase students' independence in inclusive settings. The following chapter provides a foundation for the paraprofessional-delivered, multi-component intervention that involved delivery of VSM + SLP to improve independent transitioning skills of students with ESN. Prior to introducing the multi-component intervention, a brief review of the history of inclusion for students with ESN is provided. Next, the primary components of the multi-component intervention are reviewed for VSM + SLP. An additional review is provided on the use of paraprofessionals in special education, specifically related to training and paraprofessional-implemented interventions. As shown in the theory of change in Figure 1, three main components were central to the multi-component intervention to support independent transitioning skills of students with ESN in inclusive settings. The three components include: paraprofessional implementation, VSM, and SLP.

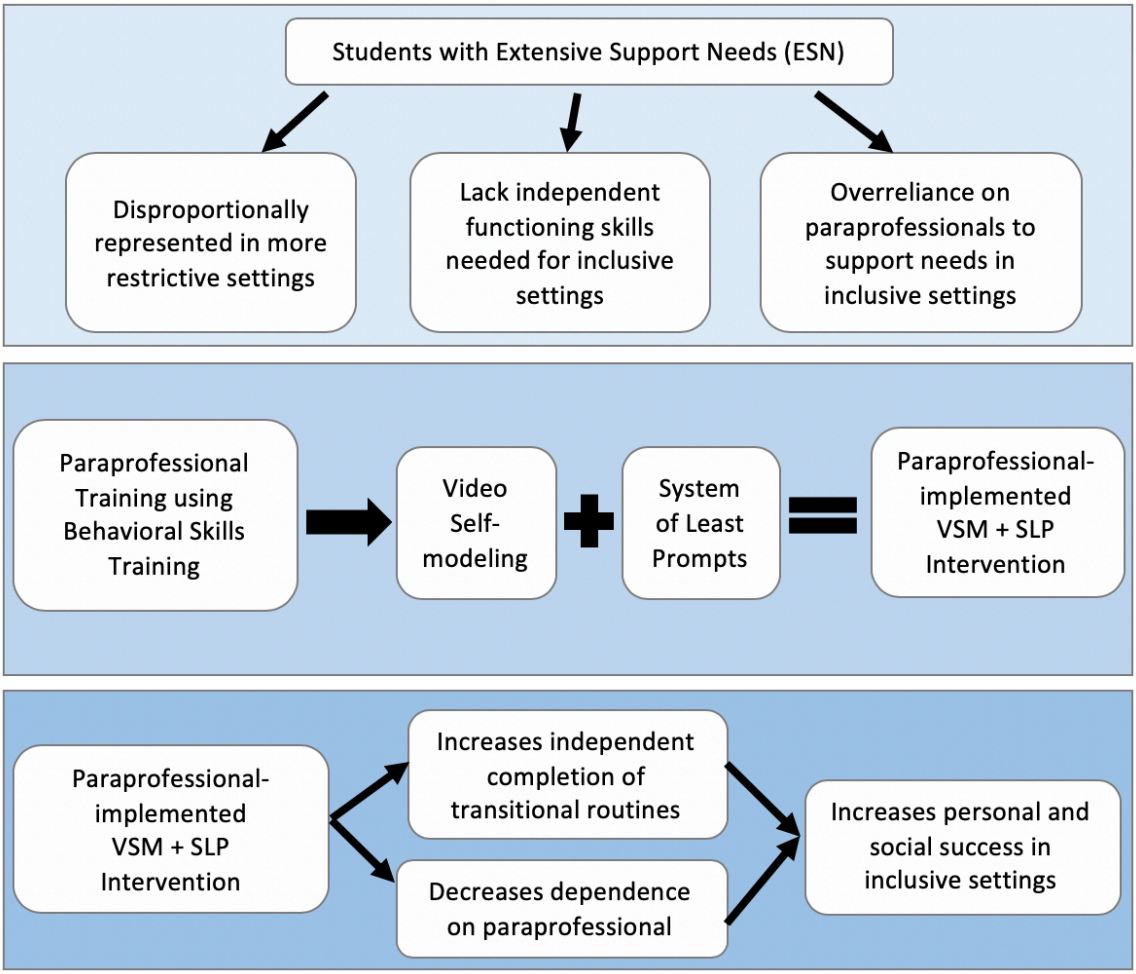

Figure 1. Theory of Change.

In response, legislation requiring the education of all students, including students with ESN, it is critical to identify and establish practices that combine EBPs to address independent skills in inclusive settings that be implemented by paraprofessionals.

Brief History of the Inclusion of Students with ESN

The initial law mandating the education of children with disabilities, Education for All Handicapped Children Act (EAHCA), P. L. 94-142 (1975), enacted an evolution in educational research for this population, who previously had minimal research-base as to how to teach these students. In a review of existing research, Ryndak et al. (2013) identified three cyclic waves of inquiry and practice related to the field of special

education research dating from 1973 to 2013. The first wave of research was initiated by the passing of the Education for All Handicapped Children Act (1975) which lead to indisputable evidence that all humans are capable of learning, including individuals with moderate to severe disabilities (Ryndak et al., 2013). Following this legislation, IDEA (2004) extended the call for more research on how to educate students with disabilities by requiring that public schools provide a free, appropriate, public education (FAPE) for students with disabilities, which led to a shift in focus toward more inclusive environments for some groups of students with disabilities, mostly students with high-incidence disabilities (Spooner & Browder, 2015). Ryndak and colleagues (2013) identified this as the second wave of special education research focused on the effectiveness of instructional strategies, instructional content, and the educational setting. Ryndak et al. (2013) termed these categories as *how to teach, what to teach,* and *where to teach* (p. 29). Although this research centered on instructional strategies, the content was mostly focused on adaptive skills in segregated settings (Ryndak et al., 2013). Since then, NCLB (2002) and ESSA (2016) added testing accountability for students with disabilities which helped shift the focus from social inclusion to academic inclusion. Although more progress is needed, current research shows that students with low-incidence disabilities benefit from systematic instruction, and these strategies can be extended in inclusive settings (Collins, 2012; Snell, 1983). Ryndak et al. (2013) identifies this as the crest of a third wave where the focus shifted towards a heavier emphasis on general education curriculum, allowing students with disabilities access to a complete education by teaching both academic content and adaptive skills in either a general education or special education setting with appropriate instructional supports.

Research to date has identified strategies proven to work with students with ESN, but currently there is a research-to-practice gap in translating what is being learned from research to training all professionals that work with students with ESN to implement identified EBPs. Within the field of special education, students with ESN may also be referred to interchangeably as *students with significant cognitive disabilities, students with the most significant cognitive disabilities, students with intensive support needs,* but will be referred to throughout this study as *students with ESN*. Students with ESN is a category devoted to those who "require the most support to learn, often categorized as having intellectual disability, multiple disabilities, ASD, or related disabilities" (Kurth et al., 2018b, p. 143). The name defines the students in this population by the level of support they need to be successful rather than titling the category by the disability label of students. It is implied that students with ESN require the highest levels of support across domains of academic, social, behavioral, communication, fine and gross motor skills, and independent functioning (Kurth et al., 2018). Based on the perceived lack of independent skills and the complexity of students with ESN needs, additional supports and personnel are needed to match the extensive support needed for them to participate in inclusion (Brock & Carter, 2015).

Inclusive settings are the classrooms or locations themselves in which inclusion occurs within a school building. The definition of inclusion has changed over time, but according to TASH (2018), an international leader in disability rights advocacy, inclusive education is a practice where all students are accepted and valued members of a general education classroom, including the total school community, allowing them to fully participate and be educated alongside typically developing, same-aged peers for the

majority of the school day. Students with ESN are often least likely to be seen spending larger parts of the day in inclusion possibly due to the perceived limitations of this population (Taub et al., 2017). Research has shown the opposite to be true. That is, students with disabilities do not require smaller or segregated settings to access education and progress in the acquisition of skills, but that some students with disabilities excel when special education services are delivered in an inclusive setting (Ryndak et al., 2010, 2013; Tremblay, 2013). Research shows positive benefits for students with ESN, but also for their general education peers. Some research has shown that students with ESN can make progress on academic and social goals in inclusive classrooms (e.g., Knight et al., 2018; Roberts & Leko, 2013). Research also has demonstrated that students without disabilities who are taught in classrooms with students with disabilities still have consistent or improved academic outcomes (e.g., McDonnell et al., 2003). Not only are gains seen in academics by general education peers, but teachers have also reported multiple positive outcomes related to social or contextual issues (e.g., peers missed class less often, were more actively engaged in lessons, and had increased leadership and empathy skills; Carter et al., 2016). Policy makers, administrators, educators, and parents should take these continued contributions to special education research into consideration when thinking about public education and the delivery of special education services for students with ESN.

In an effort to meet the academic, social, behavioral, safety, and/or medical needs of students with ESN in general education classrooms, the use of paraprofessionals to support these students is prevalent among inclusive settings (Causton-Theoharis, 2009; Giangreco, 2010; Giangreco et al., 2010; Russel et al., 2015; Ryndak et al., 2013).

Although many teachers and parents perceive paraprofessional support as necessary to meet the needs of a child with ESN in a general education classroom, there can also be detrimental effects to adaptive behavior (Causton-Theoharis, 2009; Giangreco, 2010; Giangreco et al., 2010; Russel et al., 2015; Stockhall, 2014). Adaptive behavior is defined as skills used to function in daily life and includes conceptional, social, and practical skills (American Association on Intellectual and Developmental Disabilities [AAIDD], 2018). If not used with caution, paraprofessionals can become a permanent crutch hindering students from developing independent adaptive behavior skills they need to perform routine activities (Giangreco, 2010; Giangreco et al., 2010; Russel et al., 2015; Stockhall, 2014). Over time this may result in a theory Martin Seligman (1972) termed *learned helplessness* which is *"*the inability to perform a skill due to the effects of internal or external factors unrelated to one's physical or mental capacity to actually learn or perform the skill (p. 408). Therein lies the dilemma, as many students with ESN require some level of adult support in general education classrooms but many of the adults providing this support are unaware of how to deliver appropriate levels of support or fade their support overtime (Causton-Theoharis, 2009; Giangreco, 2010; Giangreco et al., 2010; Russel et al., 2015). Sometimes well-meaning paraprofessionals justify their actions based on the assumption that the student with ESN they are supporting isn't physically or mentally capable, they may not want to see them fail, or they may not want to have to wait for the student to complete a task. When a task is completed for a student, thus eliminating the student's opportunity to participate in the task, the student may develop an expectation that they are not in control over the outcomes of situations because they did not have to perform a behavior to get the result they desired (Abramson

et al., 1987). In order to best optimize the role of paraprofessionals for students with ESN, research should focus on appropriate levels of support and implementation of EBPs in inclusive settings.

Paraprofessionals in Special Education

Use of Paraprofessionals

Following the trend of students with disabilities being increasingly included in general education settings, students with ESN are also gaining access to general education classrooms (Morningstar et al., 2017). Access to and participation in the general curriculum is often made possible by utilizing paraprofessional support for students with ESN. Across districts, paraprofessionals are also referred to as teacher aids, teacher assistants, instructional assistants, exceptional children assistant, or paraeducators. Paraprofessionals are an established and growing presence in U.S schools due to pressure to meet the demands of servicing students with disabilities, including students with ESN (Giangreco et al., 2010). Economic factors also influence the prevalence of paraprofessionals as a more cost-effective way to support students with ESN (Breton, 2010). In the most recent annual report to congress on IDEA, there were 415,781 paraprofessionals servicing students with disabilities in school settings for students with ages 6-21 (39th Annual Report to Congress on IDEA, 2018). Year to year, paraprofessionals have outnumbered special education teachers, with only 339,833 special education teachers in that same year (39th Annual Report to Congress on IDEA, 2018). Under the federal mandates for students with disabilities to be educated in the least restrictive environment (LRE), there will be an increasing demand to support

students with ESN in inclusive settings, thus the use of paraprofessionals will continue to be in demand (Morningstar et al., 2017).

Paraprofessional Roles

Paraprofessionals serve varied roles in the education and care of students with ESN. Paraprofessionals are often seen working with students with low-incidence disabilities who have the most extensive needs as opposed to higher incidence disabilities (Giangreco et al., 2010). Across the disability categories included in the definition of ESN, 72.9% of paraprofessionals work with students with ASD, 74.8% with students who have intellectual disability, and 44.4% with students who have multiple disabilities (Carter et al., 2009). Additionally, 97% of paraprofessionals reported they provided one-on-one supports for these students due to their extensive support needs (Carter et al., 2009). The roles paraprofessionals fulfill in supporting students with disabilities range greatly depending on setting, demands, and school structure. Some paraprofessionals are asked to go beyond their job title, which leads to them taking on lead roles in instruction and teaching. The federal law specifically outlines lesson planning should be done by special education teachers, not paraprofessionals (IDEA, 2004). In a survey by Fisher and Pleasants (2012) more than one fourth of paraprofessionals believed it was appropriate for them to create lesson plans. This shows that paraprofessionals may be unsure of the outlined roles in the law and will take on responsibilities beyond their job title and qualification (Fisher & Pleasants, 2012). Although federal law mandates that paraprofessionals be trained and supervised to assist special education teachers in educating students with disabilities (IDEA, 2004), there is a lack of clarity around the actual roles paraprofessionals should fill in the education of students with ESN (Brock &

Carter, 2013). Without clear guidelines as to what can or should be the roles of a paraprofessional working with students with ESN, there is room for confusion and an over assumption of responsibilities for the paraprofessional. According to Etscheidt (2005), appropriate duties for paraprofessionals may include implementing segments of team-planned instruction, collecting data to inform team-determined goals, or supporting student safety or health care needs. Paraprofessionals should not take on lead roles because their training and education is not at the same level of a special education teacher, which is why federal law mandates paraprofessionals do not take on lead instructional roles.

In many cases, paraprofessionals are the least trained to work with students with disabilities when compared to special education teachers but still serve a primary instructional role for students with ESN (Brock & Carter, 2013). In a recent evaluation of paraprofessional roles, personnel supports were found as the second most common supplementary aid and services next to curricular accommodations being the primary (Kurth et al., 2019). Types of paraprofessional supports from most common to least common include (a) academic and curricular access, (b) safety, physical, personal needs, (c) behavioral and emotional support, (d) general guidance, (e) transitioning between activities and locations, (f) check-ins with other support specialists, and (g) social communication skills (Kurth et al., 2019). In view of the vast roles that paraprofessionals play, students with disabilities also reportedly view paraprofessionals as a friend, mother, protector from bulling, and primary teacher (Giangreco et al., 2010). Students with ESN usually spend time over the course of each school year with a specific paraprofessional, and thus this creates a bond between the student and the paraprofessional. During

instructional times, paraprofessional roles must be flexible based on the targeted learning objective for the student. In daily classroom situations, paraprofessionals are often going off of quick verbal directions in passing and making modifications on the fly rather than relying on training or planning with the special education teacher (Giangreco et al., 2010). Once the lesson begins, paraprofessionals are expected to continue with the brief directions and make "game-time" decisions to support students with ESN, without direct feedback or input from the special education teacher. This can lead to misalignment of goals or instructional strategies being delivered with low rates of procedural fidelity. As a result, students with ESN may not receive appropriate instruction as designed by the special education teacher.

In addition to their specific roles, positive relationships between the special education teacher and paraprofessional are necessary to ensure students with ESN receive quality education (Biggs et al., 2016). Among some of the factors influencing the quality of the relationships are mindsets and treatment of paraprofessionals by teachers and administrators, feeling valued in a meaningful role as a paraprofessional, and being listened to prior to major decisions being made by teachers or administrators (Biggs et al., 2016). In self-contained classrooms, special education teachers and paraprofessionals spend most of their working day together. The amount of time spent working together alone is enough of a reason to have a positive working relationship. In fact, feeling respected and valued was found to be directly related to the amount of effort given and work performance of paraprofessionals (Giangreco et al., 2010). Paraprofessional roles can change throughout the day from a focused support role to an assistive role, but they always need scaffolded support from a special education teacher (Radford et al., 2015).

Working well together in clarity of roles and relational issues can improve outcomes for students with ESN. As paraprofessionals are asked to do more than ever in the multitude of roles and responsibilities they hold in the education of students with ESN, a closer examination of the education and training of paraprofessionals is warranted.

Paraprofessional Education and Training

Paraprofessionals are required to meet qualifications for hire; however, requirements can vary from state to state regarding education and experiences. Additionally, as is true for many other professions, on-going training and professional development are needed to maintain skills learned and to acquire new effective practices. In a review of 30 studies involving paraprofessionals, Walker and Smith (2015) found the majority of paraprofessionals were female with at least a bachelor's degree and represented a wide range of ages and number of years of experience. Paraprofessional training across studies focused mostly on knowledge about specific teaching skills and communication/social skills taught through workshops, lectures, classes, and experiential learning; however, there was little reported follow up or support after training and paraprofessionals requested a need for more training in other areas, such as inclusion (Walker & Smith, 2015). In another study by Carter et al. (2009), more than half (46.9%) of paraprofessionals surveyed had 0-5 years of experience. The participating paraprofessionals rated themselves on Council for Exceptional Children standard areas. Results showed they had lowest levels of ratings in the knowledge areas of rationale for assessment (31.6%), roles of education team members in planning Individualized Education Programs (23.6%), basic technologies appropriate to students with disabilities (23.0%), and rights and responsibilities of families as they relate to learning needs

(22.9%). They felt most confident with knowledge of ethical practices for communicating about students with disabilities (77.9%), characteristics of appropriate communication with members of the educational team (69.8%), and effects disability can have on a student's life (68.2%). Results from this study show that paraprofessionals are in need of more training in many areas, which should be considered in the development of training programs for paraprofessionals. Overall, more studies are warranted in the area of continuing education for paraprofessionals in order to better prepare these individuals to work closely with students with ESN.

To ensure paraprofessionals are adequately trained and supported, Breton (2010) recommends state-level education departments should (a) establish and mandate competency-based qualification standards, (b) ensure the ongoing availability of quality preservice and continuing inservice training opportunities, and (c) assure consistent appropriate and useful supervision mechanisms are in place. Carter et al. (2009) evaluated paraprofessional training and found on-the-job training (48.7%) was most popular, followed by inservice training (25.5%), then other forms of training unspecified (15.3%), and lastly conference training (10.5%). According to Carter et al., the five areas in which paraprofessionals received the most training were: (a) basic educational terminology regarding students, programs, roles, and instructional activities (88.5%); (b) rules and procedural safeguards regarding management of students' behaviors (87.9%); (c) purposes of programs for students with disabilities (87.5%); (d) effects a disability can have on a student's life (84.0%); and (e) ethical practices for confidential communication about students with disabilities (83.7%). Extending beyond format and content of paraprofessional training, materials and delivery are also important factors that impact the

effectiveness of training. In one of few studies examining paraprofessional training materials, Douglas et al. (2019) found that paraprofessional training materials were not developed with adult learning methods. Also, training models delivered by experts were shown to be less effective than a learner-centered professional development in changing practices in special education (McLeskey, 2011). Further, Morgan et al. (2004) found live, interactive training through an online platform was a cost-effective solution especially for larger school districts or remote rural areas to reach more paraprofessionals. Video modeling for training paraprofessionals is also beginning to be evaluated as a model to deliver paraprofessional training where the paraprofessionals can observe an expert deliver EBPs as they were designed (Brock, & Carter, 2015). More research is needed to determine the best format, content, and materials to use with paraprofessionals while addressing their needs as adult learners.

Another component of paraprofessional training and development is the ongoing training and supervision they receive from special education teachers with whom they work. Although special education teachers are not the ones who choose and hire paraprofessionals to work in their classrooms, they are expected to serve as direct supervisors for paraprofessionals. Special education teachers often feel unprepared for this supervisory role over paraprofessionals (Douglas et al., 2016). Irvin et al. (2018) evaluated paraprofessional and classroom factors thought to affect teacher supervision and found that teachers provided more supervision to those paraprofessionals they perceived to be inadequate and less supervision with paraprofessionals who were deemed having adequate skills. Supervision is difficult for special education teachers also because they are busy in their teaching responsibilities in a self-contained class or because they

are not present with the paraprofessionals (e.g., working with students in the general education classroom). Coaching is a possible solution to blend training and supervision, in which a special education teacher can observe and give live feedback to paraprofessionals in the classroom or school setting through verbal collaboration before, during, and after a teaching set (Ledford et al., 2018). Coaching has been found effective in improving paraprofessionals' use of EBPs, which in turn can increase student engagement (Ledford et al., 2018). One of the most common forms of coaching is when feedback is delivered after the observation. This form of coaching allows the trainee to get feedback almost immediately to apply for the next session. Another form of coaching, called "bug-in-ear," allows special education teachers to train paraprofessionals by talking in a small speaker into a paraprofessional's ear while he/she is working with students (Scheeler et al., 2018). Scheeler et al. (2018) found immediate feedback through bug-in-ear from the special education teacher increased contingent specific praise given by paraprofessionals for students with ASD. One of the problems with coaching or bug-in-ear technologies is they require special education teachers to be relieved from their teaching duties or an outside person with expertise to come in and teach effective practices through a coaching model, which is challenging when schools have tight budgets. More efforts need to be made to explore coaching models using live feedback as a bridge between training and supervision of paraprofessionals.

Unfortunately, even when paraprofessionals are properly trained, administrators struggle to hire and retain qualified paraprofessionals due to the high turnover rates related to the stress outweighing the pay (Giangreco et al., 2010). According to Giangreco et al. (2010), paraprofessionals supporting students one-on-one are among the

highest turnover due to burnout, which in turn negatively affects students with ESN because they have to learn and build rapport with new paraprofessionals. Paraprofessionals do not have the same education and qualifications as special education teachers; thus, professional development in the form of training and supervision is critical in the success of paraprofessionals working with students with ESN. Little is known about the role that general education teachers play in supporting paraprofessionals in inclusive settings.

Use and Overuse of Paraprofessionals

Paraprofessionals' roles vary based on the setting demands and student needs. For students with ESN in inclusive settings, the most common arrangement is having a paraprofessional serve as a one-on-one assistant to a student. This decision is often made with good intentions or out of "necessity." According to Giangreco (2010), one-on-one paraprofessionals are used too often in inclusive settings as an attempt to provide a solution for the student with a disability to attend classes with general education peers. Placing a student with ESN with a one-on-one paraprofessional may not be in the best interest of the student for several reasons. Giangreco et al. (2005) outline five reasons to be concerned about one-on-one supports: (a) the least qualified staff members are teaching students with the most complex needs; (b) paraprofessional supports are linked with inadvertent detrimental effects on student membership and independence in the classroom; (c) individual paraprofessional supports are linked with lower levels of general education teacher involvement; (d) teachers, parents, and students may not be receiving the services as they were designed in the education plan for the student; and (e) providing paraprofessional supports may delay attention to any changes that need to be

made in educational programming. Earlier research by Giangreco et al. (1997) showed similar results when questioning if paraprofessionals are helping or hovering because the presence of a paraprofessional was often related to negative effects, such as (a) interference with ownership and responsibility by general educators, (b) separation from classmates, (c) dependence on adults, (d) impact on peer interactions, (e) limitations on receiving competent instruction, (f) loss of personal control, (g) loss of gender identity, and (h) interference with instruction of other students. Knowing the ways one-on-one paraprofessionals can hinder students rather than help them should be a significant contributing factor in making educational placement and staffing decisions for students with ESN (Giangreco et al., 2012).

One of the benefits of having paraprofessionals work with students with disabilities is the balance between supports offered by the paraprofessional and other special educators. Students need proper supports in place, to prevent putting a temporary solution on a problem that needs a better solution than assigning the student an adult to make up for the child's areas of deficit, rather than teach to the skill deficit (Giangreco & Doyle, 2002). According to Giangreco and Broer (2005), virtually no student outcome data exist suggesting that students with disabilities do as well or better in school given paraprofessional supports. Additionally, paraprofessionals spend nearly a quarter of their time self-directed and, on average, special education teachers spend less than 2% of time training, supervising, or giving other professional direction, which brings to question whether students with disabilities are getting adequate instruction if the majority of their time is spent with a paraprofessional (Giangreco & Broer, 2005). One of the biggest detrimental effects related to the overuse of paraprofessionals is that students develop a

sense of overreliance because independent skills become stifled by the extra assistance the paraprofessional provides. In a study by Russel et al. (2015) investigating the effects of increasing distance of a paraprofessional on student engagement, findings showed the student with a disability in the study was able to maintain engagement if paraprofessional support was faded but not when it was abruptly removed. In this study, the participating general education teacher reported she was able to prompt and praise the student more and the paraprofessional said she was able to provide supports to other students in the classroom. Using paraprofessionals is not a bad practice, but it should be used in moderation with careful consideration for the student with a disability in the design and service delivery role that a paraprofessional is assigned. Giangreco (2010) gave ideas for alternatives to overreliance on paraprofessionals, such as (a) resource reallocation (e.g., swapping paraprofessional positions for special education positions), (b) coteaching, (c) increasing ownership of general educators and their capacity to include student with disabilities, (d) transitional paraprofessional pools (e.g., hiring from short-term staff), (e) reassigning paraprofessional roles (e.g., less one-on-one and more classroom assignments), (f) lowering special educator caseloads to increase opportunities to provide support in the classroom, and (g) utilizing peer supports when appropriate. Following suggestions from research and measuring the amount of support paraprofessionals are expected to provide will help alleviate the overreliance of paraprofessionals in special education, specifically with students with ESN.

Paraprofessional-implemented Interventions

Paraprofessionals are capable of implementing interventions with proper training and support. With the increased prevalence of paraprofessionals working in special

education, the research base on paraprofessional-implemented interventions is growing. Paraprofessional-implemented interventions have been shown effective in several domains, including: vocational (Seaman-Tullis et al., 2018; Wood et al., 2007), communication (Barnes et al., 2011; Bingham et al., 2007; Robinson, 2011; Ryan et al., 2008; Wermer et al., 2018), social (Causton-Theoharis, & Malmgren, 2005; Licciardello et al., 2008; Malmgren et al., 2005; Mazurik-Charles, & Stefanou, 2010; Quilty, 2007), behavior (Bassette, & Willis, 2007; Hall et al., 2010; Lavie, & Sturmey, 2002; Martella et al., 1993; Schepis et al., 2001), academic (Knight et al., 2018; Johnson et al., 2004; McDonnell et al., 2002), and multiple skills through Discrete Trial Training (Bolton, & Mayer, 2008; Dib, & Sturmey, 2007; Gillian et al., 2007; Leblanc et al., 2005). Although paraprofessionals have implemented interventions across a wide variety of skills and domains, a closer examination is needed regarding how paraprofessionals are trained to implement interventions successfully.

Paraprofessional-implemented Intervention Training. A component of training for paraprofessionals is specific training on how paraprofessionals deliver EBPs. Currently, research is lacking on paraprofessional-implemented interventions using EBPs to determine what can and should be implemented by paraprofessionals (Brock & Carter, 2013). More research is needed on training models used for teaching intervention strategies to paraprofessionals; however, when given adequate training, paraprofessionals are capable of using EBPs to implement interventions for students with intellectual disability (Brock & Carter, 2013). Paraprofessionals are often trained to implement interventions to improve student outcomes for academic achievement, increase independence, reduce challenging behavior, promote social inclusion, teach

communication skills, and improve participation in the school and community (Brock & Carter, 2013). According to Brock and Carter (2013), paraprofessionals learn best when instructions were clear, training was focused on specific skill they needed to master, and when support continued throughout practice implementation sessions. Rispoli et al. (2011) conducted a literature review to examine 12 studies in which paraprofessionals were trained to implement interventions with individuals with ASD in school and rehabilitation settings. Positive outcomes were reported in 92% of the studies. Training models used across the studies included (a) written and verbal explanations, (b) modeling, (c) video demonstrations, (d) role playing, and (e) feedback. Performance feedback and verbal or written instructions were listed as the most common training models used; however, because most of the studies reviewed used a combination of the above training models, it is unclear what individual components produced the greatest effects (Rispoli et al., 2011). Walker and Smith (2015) also reviewed paraprofessional training models and found more than half of the 30 studies reviewed were in inclusive settings but only a few focused on paraprofessional training for the necessary knowledge and skills required for supporting students with disabilities in inclusive settings. Walker and Smith suggest that two primary areas of focus for paraprofessional training were (a) knowledge about specific skill or strategy (e.g., discrete trial training, embedded instruction, prompting) and (b) communication and social skills through communicative facilitation strategies and social skills teaching for students with disabilities. With paraprofessionals often serving in primary instructor roles for at least some of the time, it is essential for paraprofessionals to be adequately trained to deliver interventions.

Paraprofessional Training Models for Implementing Interventions. Although there is research demonstrating that, once paraprofessionals are trained to implement EBPs, they are capable of doing so effectively, studies are limited focusing on which training procedures are most effective (Brock & Carter, 2015; Brock et al., 2017). In an attempt to explore appropriate training models, Brock et al. (2017) examined the use of video modeling to train paraprofessionals to implement EBPs. Student outcomes improved as a result of the paraprofessional-implemented EBPs but even with the use of this advanced technology, the paraprofessionals still required in-person feedback, which involves face-to-face instructional time. This study points out the flaws of many paraprofessional training models, highlighting the need for interactive, process-oriented training. Further, Brock and Carter (2017) conducted a meta-analysis of 12 studies evaluating educator training and implementation of interventions for students with disabilities; results showed the following two specific training strategies were consistently found to be effective across studies: modeling and performance feedback. Additionally, outcomes from these studies did not have larger effects given an increase in the duration of training; thus, results suggest that how educators are trained was more important than the time spent in training.

Behavioral Skills Training. As a solution to the need for a comprehensive paraprofessional training model, BST is a time-efficient and cost-effective option for paraprofessional training that follows a step-by-step process in which the trainer and trainee interact until the trainee shows mastery with the targeted skills chosen for the training (Parsons et al., 2012). BST is rooted in applied behavior analysis (ABA). Baer and collogues outlined one of the seven dimensions of ABA as “effective,” meaning “if

the application of behavioral techniques does not produce large enough effects for practical value, then application has failed (Baer et al., 1968, p 96).” An intervention is only as effective as the implementation; therefore, training for using EBPs is of the utmost importance if seeking to close the research to practice gap in classrooms where students with disabilities are being served. A checklist is recommended to measure implementation fidelity throughout the application of an evidence-based practice to ensure critical elements are present to support student success in responding to the evidence-based practice intervention (Yates et al., in press). Frontline staff, such as paraprofessionals, are a valuable asset because their work dictates the overall standard of care being delivered by a school (Gormley et al., 2019).

BST consists of four essential components: direct instruction, modeling, rehearsal, and feedback (Parsons et al., 2013). For application with paraprofessionals, direct instruction would involve the trainer giving the paraprofessional an explanation of how to implement the chosen intervention, in either written or verbal format. During the second step, modeling, the implementation of an EBPs would be demonstrated, either in person or through video instruction. Rehearsal would follow, where the paraprofessional would be given the opportunity to practice the skill with supervision of the trainer. This rehearsal component is one of the most important parts of BST because it leads to the last step, which is feedback. After the paraprofessional has practiced the skill, feedback would be given for correct implementation of the EBP or coaching and corrective feedback would be provided to move the paraprofessional towards correct implementation of the EBP if they were not completing all parts of the intervention correctly. BST has been used to teach children, adults, and individuals with

developmental disabilities a wide variety of important skills. Previous applications of BST have focused on training behavioral strategies for managing challenging behavior (Fetherston & Sturmey, 2014; Hall et al., 2010; Hogan et al., 2014) and communication (Homlitas et al., 2014). It also has been used to teach staff and parents how to work with children and individuals with developmental disabilities (Miller et al., 2014; Stewart et al., 2007). Gormley et al. (2019) completed a scoping review of published literature, including 156 papers, investigating the inadequate dissemination of EBPs through staff training for with individuals with intellectual and developmental disabilities. Results showed that staff training was not provided in the studies focused on EBPs and few studies utilized BST as a training model. Researchers concluded that many other researchers are not incorporating the surmounting evidence base for the use of BST in training as an effective training package to improve outcomes as the result of proper implementation of EBPs. BST is a promising training method for training paraprofessionals how to use EBPs because it allows for the paraprofessional to practice implementing EBPs with trainer feedback and praise, allowing for successful transfer of skill mastery. Using this model, paraprofessionals would not be asked to implement EBPs with a student with a disability until the trainer felt confident they could assume the lead interventionist role, given the procedural fidelity levels of the paraprofessionals' implementation of the chosen EBP. Through proper implementation of EBPs by paraprofessionals, students with disabilities are closer to an effective education by multiple service providers.

Paraprofessional-implemented Interventions to Increase Independence.

Independence and use of paraprofessional interventions may seem antithetical because an

individual cannot be independent and receive help from a paraprofessional at the same time. Independence is complex because the goal in paraprofessional-implemented interventions related to independence is to assist the student in performing a task independent of the paraprofessional through natural teaching opportunities, fading supports, and reducing prompting.

One way to achieve independence in inclusive classrooms is to structure teaching opportunities within the context of the natural learning environment. Schepis et al. (2000) evaluated a training program for four paraprofessionals in an inclusive preschool on how to provide prompts, correct, and reinforce behavior in naturally occurring teaching opportunities with five children with disabilities. Paraprofessionals were trained using verbal and written directions, role-playing, and through monitoring and feedback. The research design was a multiple probe across paraprofessionals design across two school years. Data were collected on teacher and student behavior during baseline and after the embedded teaching-skills training program had been implemented. The dependent variable for teachers was the percentage of teaching opportunities with correct teaching and the percentage of teaching opportunities with target child behavior. Data were collected on students' response, independent behavior or no response, to the teaching opportunities presented during baseline and intervention. Results showed paraprofessionals improved their ability to notice and teach in naturally occurring teaching opportunities using correct teaching strategies with the introduction of the embedded teaching skills featuring on-the-job training and feedback. After the training, students with disabilities became more independent in responding without any additional prompting or assistance.

In another study with the goal of increasing independence, Hall et al. (1995) investigated the effects of using photographic activity schedules on prompt reduction for students with disabilities. This study focused on decreasing prompts to improve engagement rather than teaching a skill using a prompting system. The goal of the study was to reduce the prompt dependency and frequency in which the students with disabilities were relying on their paraprofessional aides in the classroom. Paraprofessionals were trained to reduce verbal prompts and only provide physical prompts. A nonconcurrent multiple baseline design was replicated across three paraprofessional-child pairs scoring percentage of intervals paraprofessionals prompted. Data were also collected for each type of prompt used by paraprofessionals during baseline and during the physical-only instruction intervention. Results of this study showed a decrease in all types of prompting levels by paraprofessional aides and an increase in independent engagement for all students with disabilities.

Regardless of the intervention, reducing prompting of paraprofessionals requires training for the paraprofessional to implement interventions in a specific way through procedural fidelity measures in order to decrease a student's prompt dependence on the paraprofessional. Toelken and Miltenberger (2012) evaluated the effects of using an embedded teaching procedure to teach two paraprofessionals to use least-to-most prompting to increase independent responses of two children with ASD in an inclusive classroom. A multiple baseline design across behaviors was used to measure the levels of prompting paraprofessionals delivered during baseline and after paraprofessionals were trained to use least-to-most prompting strategies to show the level of independence each student demonstrated across tasks for both participants. The intervention for the first

participant was implemented across the following three tasks: opening lunch box, wiping table, and rubbing hands together while washing hands. The second participant's target behaviors for intervention were putting papers in backpack, putting on backpack, and opening classroom door. Results showed that, by teaching paraprofessionals specific procedural steps for giving instructions, modeling, rehearsing, and giving feedback, both students showed an increase in independence in each skill as taught by their paraprofessionals. In each of these studies, paraprofessionals were able to provide intervention that resulted in students gaining independent skills through a change of approach in natural environments or through different prompting strategies.

Through this review of research, it is apparent there is a lack of ample research on paraprofessional-implemented interventions used to increase independent skills. Specifically, there are no studies currently existing in literature of paraprofessional-implemented interventions for paraprofessional implemented VSM and only one study using paraprofessional-implemented SLP. Additionally, paraprofessional-implemented interventions are scarce in the research for inclusive settings with students with ESN.

Summary

Paraprofessionals have been consistently prevalent in the field of special education, especially for educating and supporting students with ESN and this is not expected to change. Paraprofessionals should be responsible for delivering parts of instruction under the direction of a special education teacher or general education teacher in a general education classroom, and they should not be in charge of developing curriculum and lesson plans. Attention needs to be focused on how to best utilize paraprofessionals in ways that support students' needs without over-assisting. A common

goal for students with disabilities is for them to be independent as much as possible in all areas of academic, social, communication, and behavioral domains. For this reason, the use of paraprofessionals needs to be a minimized while maximizing student independence. Paraprofessionals can also foster independence by implementing EBPs to reduce the need for prompting by providing other supports that do not require one-on-one assistance, such as VSM + SLP.

Technology in Schools

The technological landscape of classrooms across the nation is changing, thereby impacting the potential challenges and opportunities students with disabilities face in these classrooms. Following the ample research showing the benefits of assistive technology (e.g., augmentative communication devices) for students with disabilities (Alper & Raharinirina, 2006), instructional technology (e.g., computer assisted instruction) is another form of technology that can be used to enhance the learning outcomes of students with disabilities. There is a difference between using assistive technology which supports students in accessing instruction and responding and instructional technology that helps teach new skills. The use of special education technology has a large research base with *The Journal of Special Education Technology* being entirely devoted to publishing supporting research. New forms of technological support are rapidly being developed and becoming increasingly accessible in public schools. The field of special education technology is devoted to "digital equity" for students with disabilities by helping augment, bypass, or compensate for a disability (Edyburn, 2013). The accessibility and ease of use for teachers has a promising impact on the applications of such technology for students with ESN to become more independent

in general education classrooms (Ayres et al., 2013). In order to support instructional technology in general education classrooms, educators need to be informed of possible interventions using technology and have the opportunity for professional development on how to use devices to implement these types of interventions (Okolo & Diedrich, 2014). Prior data-based studies have shown the use of technology to teach students with disabilities has had positive outcomes (Alper & Raharinirina, 2006; Ayres et al., 2013; Okolo & Diedrich, 2014). Specifically, video modeling has been used to teach a variety of skills, such as daily living, academic, leisure, and social skills (Park et al., 2018).

Video Modeling

The use of instructional technology in classrooms allows students with disabilities to perform academic and adaptive skills through interventions such as video modeling. Video modeling is rooted in Bandura's (1977) *Social Learning Theory* which suggested humans learn by observing others model behaviors and observing consequences that follow. Imitation is a subtype of social learning which requires a "frame of reference" or the ability to understand the context and viewpoint as a way to guide the viewer to completing a task as the model shows (McCoy & Hermansen, 2007). Video modeling involves showing a video of the performance of a targeted skill to a student. Videos can be created on several technology platforms, including personal cell phones and iPad®s. After watching the video, the student has the opportunity to perform the task. At this point, the instructor can use response prompting procedures to support the student through performing the skill. Video modeling has important applications in inclusive settings because students with disabilities have been shown to initiate, maintain, and generalize skills across learning environments from a single video model made for a

specific setting (Carnahan et al., 2012). Video modeling is appealing to teachers and parents because it is convenient once one is trained in the practice and is a non-invasive intervention for the student with a disability because videos can be recorded and edited with relative ease, and then shown to the student quickly with little disruption to the student's routine (Banda et al., 2007). Hall et al. (2017) defined the following stages required to implement a video modeling intervention: (a) identification of needed skill, (b) creation and editing of videos, (c) implementation with target student, (d) data collection, and (e) planned fading of the video model support. Additional benefits of video modeling include the ability to obtain students' attention and the ability to have total control over the initial stimuli (Dorwrick, 1991).

To understand the benefits of video modeling, it is necessary to know more about the previous usage of video instruction for students with ESN. Ayres and Langone (2005) conducted a literature review to investigate intervention and instruction with video for students with ASD. Researchers included 15 studies that met the inclusion criteria between the years 1987- 2004. Results showed that using video modeling to teach functional skills to learners with ASD was effective. These studies were typically focused on daily living or self-care skills. Many of the studies included stated limitations in generalization of results because they did not reveal which factors were critical components of video models and video instruction. Interventions used in these studies utilized limited types of easily accessible technology and educational software programs for teachers to use with students.

Another important distinction to make is the difference between video modeling and video prompting. Video prompting is different than a video model in that there are

several stopping points in the video and often voice or text narration of each step which makes each step a separate piece rather than combined in one streamlined video (Le Grice & Blampied, 1994). When creating a video prompting intervention, short video clips or still photos are used showing the individual steps of a targeted skill (Banda et al., 2011). Video prompting allows the student to perform a skill one step at a time while watching the video segments as opposed to performing the skill after watching a whole task, like in video modeling. One of the benefits of video modeling is that students can quickly watch the full video without needing prompts by an adult to assist in moving through the video segments of a video prompting intervention (Bellini & Akullian, 2007). Also, the video model is easier to fade because the student does not receive prompts throughout the task, which is another layer of intervention to have to fade when removing the intervention and prompting independent skills.

Another systematic literature review was conducted by Park et al. (2018) investigating the effects of video modeling and video prompting interventions on individuals with intellectual disability. These researchers included 41 studies that met the inclusion criteria between the years 2004- 2016. Results revealed the most frequently taught skill for individuals with intellectual disability was daily living skills, and video modeling and video prompting were used equally to teach these skills. Authors stated many studies combined video modeling and video prompting with additional strategies (e.g., error correction, constant time delay) and only one third of the studies included a generalization measure. Authors recommended additional research to analyze which situations video modeling and video prompting can work alone or when it needs to be paired with additional strategies.

Video models can be presented in several formats and often have overlap in the style of video presented to the student with a disability. Often times in literature the different types of video models are referred interchangeably with the term *video modeling*, although video modeling can be used to describe any of the types of video models. Among the main types of video models are video modeling of others (VMO), point of view video modeling (POV-VM), continuous video modeling (CVM), and video self-modeling (VSM), which will be described in more detail in the following sections.

Video Modeling of Others. Among the different types of video modeling, video modeling of others (VMO) can be easy to create because less editing is required. VMO involves video recording another person, adult or peer, performing the targeted task and then playing this video model for the student with a disability receiving the intervention (McCoy & Hermansen, 2007). The researchers found the majority of VMO by adults were for play and social skills and the majority of VMO by peers were for language development as social communication during play and independent living skills. In a meta-analysis conducted by Mason et al. (2012), researchers evaluated the outcomes of 42 VMO intervention studies. Results showed that VMO is highly effective for individuals with ASD and moderately effective for individuals with other developmental disabilities. The researchers recommended that future studies using VMO evaluate the implications of pairing VMO with error correction and prompting procedures.

Point-of-view Modeling. Point-of-view (POV) modeling is a variation of video modeling, but rather than having the student observe a scene with an individual modeling the targeted task, the model is based on the student's point-of-view. POV modeling includes visual images that would been seen from the perspective of the student (e.g.,

images of hands demonstrating a specific task, images of hallways while walking through a building; McCoy & Hermansen, 2007). For example, Garner and Wolfe (2015) used POV modeling to teach four adolescents with developmental disabilities to wash dishes as a daily living skill. The video clips were filmed from the performer's perspective and then played back on an iPad® near the sink for the participants to watch while completing the task. The POV intervention was paired with pre-recorded narration for each step and error correction provided by an adult. Results demonstrated that all four participants learned the skill of washing dishes and were able to maintain their performance over time. Researchers believed the explicit instruction procedures and immediate feedback given during the POV intervention contributed to the intervention's success.

Video Self-modeling. Video self-modeling (VSM) refers to "the observation of images of oneself engaged in adaptive behavior" (Hitchcock et al., 2003, p. 37). The majority of VSM interventions have been conducted with individuals on the ASD spectrum focusing on self-help and daily living skills (McCoy & Hermansen, 2007; Park et al., 2018). Of the different types of video models, researchers found VSM as the intervention that seemed to be most successful across behaviors and the one that had more applications of generalization to other settings and situations. Although VSM has many applications in daily living skills, it has also been used to support academic skills. Burton et al. (2013) investigated the effects of VSM on the mathematics skill acquisition of adolescents with ASD by having four participants view videos of themselves on the iPad® solving mathematical problems for making change. Results supported a functional relation between VSM and performance on math skills. The researchers noted the VSM

intervention allowed participants to independently access help through technology without additional teacher assistance, thus, increasing overall independence in their math classroom.

Research to Support Video Modeling. Video modeling has been identified as an EBP for students with ASD (Wong et al., 2015) and students with severe disabilities (Browder et al., 2014). Additionally, the National Professional Development Center on ASD and the National Secondary Transition Technical Assistance Center have identified video modeling as an evidence-based practice for teaching students with disabilities (Courtade et al., 2015). Video modeling has been used as an intervention for students with disabilities across various domains including play (D'Ateno et al., 2003), social skills (Spivey & Mechling, 2016), safety (Mechling et al., 2009), motor skills (Mechling & Swindle, 2012), daily living (Mechling et al., 2015; Scott et al., 2013), academics (Burton et al., 2013; Cihak & Bowlin, 2009), transitional skills (Cihak et al., 2010), and employment skills (Mechling & Ortega-Hurdon, 2007). Several comparison studies have been conducted to evaluate the effects of different types of video modeling as well as video modeling versus video prompting for children and adults with ESN. (Alberto et al., 2005; Cannella-Malone et al., 2006; Cannella-Malone et al., 2011; Cihak et al., 2006; Cihak & Schrader, 2008; Mechling et al., 2014ab; Mechling & Collins, 2012; Van Laarhoven & Van Laarhoven-Myers, 2006). Findings from these studies and others have offered mixed results as to which strategy is more effective; however, none show adverse effects for using video modeling.

In a meta-analysis of prior data-based studies, Bellini and Akullian (2007) examined the effectiveness of video modeling and VSM interventions for children and

adolescents with ASDs. The researchers included 23 single-subject design studies that met the inclusion criteria between the years of 1980–2005 and analyzed each study for eight variables: (a) participants, (b) setting, (c) type of video model, (d) targeted skills, (e) dependent variable, (f) intervention, (g) maintenance, and (h) generalization. Results indicated that video modeling and VSM were effective interventions for addressing social-communication skills, behavioral skills, and functional skills in children and adolescents with ASD. The strongest intervention effect was for functional skills (*n*= 8, *M* Percent of Non-overlapping Data= 89%, range 43%–100%; followed by social-communication skills (*n*= 15, *M* PND= 77%, range 29%–98%); and lastly behavioral functioning (*n*= 3, *M* PND 76%, range 42%–95%). Based on the results of the meta-analysis, the researchers stated video modeling and VSM both qualified as EBPs for individuals with ASD; however, this study did not examine the effectiveness for other disability populations.

Since the prior reviews of literature, other data-based studies have shown video modeling used as portable technology. For example, Hart and Whalon (2012) conducted a study to examine the impact of VSM delivered on an iPad® on the academic responding of a high school student. An ABAB reversal design was used to analyze the frequency of correct, unprompted responses with and without the use of a VSM intervention. Results indicated a functional relation between use of VSM and number of correct and unprompted academic responses when introduced at each of the intervention phases of the study. This study highlights the success of using VSM as an intervention to increase independent skills related to academic engagement; however, it was not conducted in an inclusion classroom where independent skills are in higher demand.

Another study using portable video modeling showed the effects on transitional activities for older students. Spriggs et al. (2014) paired video modeling with activity schedules (VAS) to increase independence for high school students with ASD through transitions between activities in a resource classroom. The purpose of this study was to evaluate the effect of VAS with embedded video modeling using an iPad® application on the acquisition and generalization of novel skills (e.g., check writing, algebra, paragraph writing, table setting), as well as independence during transition activities. A multiple probe across participants design was used to determine the percentage of steps on a task analysis completed independently in response to the VAS with embedding video modeling intervention. Findings indicated participants were able to independently transition within and between tasks. Prior to introduction of the intervention the students were dependent on adults to prompt them to complete each step in a task and to transition between tasks. Afterwards, participants exhibited high rates of generalization to VAS and novel tasks after the video model was removed.

Summary

Technology is permeating schools across the country, thus, students with ESN are able to access instructional technology more easily in schools. Research shows that many students with disabilities are comfortable using touch-screen devices, such as iPad®s, and even prefer these devices over lower-tech options (Stephenson & Limbrick, 2015). Research supporting video modeling shows this can be an effective EBP for students with ESN across many domains (Bellini & Akullian, 2007; Browder et al., 2014; Courtade et al., 2015; Wong et al., 2015); however, the majority of existing research focuses on older individuals with ASD and intellectual disability in areas of daily living and job skills

(Bellini & Akullian, 2007; Courtade et al., 2015). Research also limited as few studies have focused on using video modeling as an intervention in inclusive settings. Additionally, only two studies addressed transitional skills for students in inclusive settings (Cihak et al., 2010; Reyes et al., 2020). As a result, more research is needed to determine the best practices for implementing video modeling in inclusive settings for students with ESN for increasing independence through transitional routines.

Systematic Instruction

According to Spooner and Browder (2015), one of the most significant instructional advances for students with severe disabilities (i.e., ESN) is the work stemming from the application of the principles of operant behavior (e.g., stimulus control, positive reinforcement) from the work by Skinner (1938, 1953). Systematic instruction follows the principles of operant behavior in the form of behavior analysis and is applied to teach students with severe disabilities (Snell, 1978). In fact, the majority of practices identified as EBPs are based on systematic instruction and rooted in applied behavior analysis (Collins, 2012; Cooper et al., 2020). The purpose of using systematic instruction is to create structured learning that is clearly defined and replicable for use with students with severe disabilities and responding to students' performance by making appropriate modifications (Snell, 1983). Systematic instruction begins with targeted skills and teaches these skills by systematically applying attentional cues, prompts, and specific consequences to promote moving students towards mastery of the new skill through several instructional trials. Students with severe disabilities who typically require explicit and repeated instruction benefit greatly from systematic instruction as the preferred form of instructional delivery for this population (Collins, 2012). Systematic instruction

includes many components of which two are highlighted in the next sections: task analytic instruction and response prompting.

Task-analytic Instruction

Task-analytic instruction occurs when a multi-step task is divided into smaller steps to be taught individually. Often, each step in a task serves as the cue for the student to perform the following step until the task in completed. Bensburg (1965) was one of the first to outline the process of creating a task analysis. One of the best ways to determine what steps involved in a larger task is to perform the task yourself or observe someone else performing the task while taking detailed notes as to what the steps are and in what order they should be completed. Task-analytic instruction is often paired with systematic prompting procedures to move through the steps. Research demonstrating the effectiveness of using task-analytic instruction with systematic prompting procedures spans three decades. When paired together, these practices are effective for teaching individuals with ESN functional skills (e.g., tooth brushing; Horner & Keilitz, 1975) and academic skills (e.g., letter writing; Collins et al., 2001). Prompting is paired with task-analytic instruction so students can begin learning with assistance and then move towards more independent skills over time.

Response Prompting

Response prompting refers to anytime an instructor provides additional visual, auditory, textual, or symbolic prompts that helps a student to perform a desired behavior. This form of prompting differs from a stimulus prompt because it is delivered in response to the learners' response or lack of response to entice a correct response. Early research in task analytic instruction suggested the use of response prompting procedures as a form of

stimulus control that could be transferred from unnatural prompts to more naturally occurring environmental stimuli (Billingsly & Romer, 1983). Wolery and Gast (1984) outlined four response prompting procedures to transfer stimulus control from prompts to naturally occurring stimuli: (a) time delay, (b) most-to-least prompts, (c) system of least prompts, and (d) graduated guidance. Researchers have explored the efficacy of the different response prompting procedures and determined three main components that are common among best-practice usage of all response prompting procedures: (a) consistency with prompting, (b) pre-planning fading procedures to reduce prompt dependence, and (c) outlining specific error correction procedures (Blair et al., 2018). Many response prompting procedures are identified as an EBP for teaching students with moderate to severe disabilities (Browder et al., 2014); however, one of the most well researched response prompting procedures is system of least prompts.

System of Least Prompts. The system of least prompts (SLP) procedure is a response prompting procedure commonly used to teach students with disabilities (Wolery et al., 1992). The procedure begins with securing the student's attention and then delivering a task direction (e.g., asking student to line up for lunch). Following the student's correct or incorrect response, the instructor responds by delivering a consequence (e.g., praise, pat on the back, edible, etc.) for a correct response, or by providing a prompt for incorrect responses. If no independent response is provided by the student during the response interval (e.g., wait time), the next least intrusive prompt is delivered from the prompt hierarchy, and consequences are delivered (e.g., descriptive verbal praise for correct responses or continued error correction procedure for errors or no responses). The system of least prompts uses a prompt hierarchy beginning with the

least intrusive prompt and moves towards more intrusive prompts. Prompting hierarchies differ in the amount of support or information provided to the student and is preferred over prompting procedures that rely on a single prompt. One of the benefits of using SLP is that this procedure allows the instructor to use each prompt of the hierarchy during instruction until the student moves toward more independent responding with the goal of fading the need for the more intrusive prompts overtime. SLP is most appropriate for students who may know how to perform parts (but not all) of a task and it can be used to teach discrete and chained tasks (Neitzel & Wolery, 2009). Chained tasks are any tasks where the steps for completion can be broken down into smaller, sequential steps (Cooper et al., 2020). Chained tasks can be taught using a task analysis in three main ways, including total task presentation, forward chaining, and backward chaining. Total task presentation teaches every step in a task in order each time, while forward chaining teaches one step in the chain at a time from the beginning and backward chaining teaches each step from the last step backwards to the first step (Cooper et al., 2020). When teaching chained skills, task analytic instruction is often paired with the response prompting procedure of SLP, especially for teaching using total task presentation.

Before instruction begins, instructors must first establish a hierarchy of prompts from least to most assistance which fit the student's need. For example, the progression of prompts may move in order from gestural, verbal, model, and physical guidance. Some students benefit from having a verbal and model paired together as level in the prompting hierarchy and others may benefit from a video model during the model step instead of a live model (Smith et al., 2015). The following procedures were outlined originally by Wolery et al. (1986) and confirmed by Doyle et al. (1988). When instruction begins, the

instructor must first allow the student to have an opportunity to make an independent response. Typically, a consistent interval is set from the beginning and if the student does not respond within a set interval (e.g., 3 seconds), the instructor provides the next least intrusive prompt in the hierarchy (e.g., gestural) and waits for a response within a set interval. If the student still does not produce a correct response, then the instructor provides the next prompt in the hierarchy (e.g., verbal) and again waits for a response within a set interval. Each instructional session proceeds in this manner until the most intrusive prompt is used (e.g., physical guidance), if needed. The progression through the prompting hierarchy stops once the student performs a step in a task correctly. SLP instruction continues until the student meets a criterion of correct independent responses for a task. Another important component for implementing SLP is using data to make informed instructional decisions. Data are recorded on the type of prompt necessary to perform a correct response, but typically only independent unprompted correct responses are graphed and counted toward skill mastery. Instructors can use this information to know when to move to another skill or if a chained skill should be broken down into smaller steps.

The purpose of SLP is to assist in transferring stimulus control from response prompts to more natural stimuli in the environment if the student does not respond to the natural stimulus or makes an incorrect response during a task (Doyle et al., 1988). Consistent features of an effective implementation of SLP follows were outlined by Doyle et al. (1988) as (a) predetermining the number and type of prompts to include in the least-to-most assistance prompt hierarchies, (b) presenting the target stimulus at each prompt level, (c) using a fixed response interval, and (d) delivering reinforcement

following correct prompted and unprompted responses. Using SLP to teach a chained skill with multiple steps allows students to have an opportunity at each step to perform the response with the least amount of assistance and only increase assistance if the student does not perform an individual step correctly in the task analysis (Cooper et al., 2020). Within this prompting system, the first level of prompts constantly allows the student to respond independently and the remaining levels are sequenced based on the level of assistance required, with the last level of the hierarchy resulting in the student performing the behavior correctly (Neitzel & Wolery, 2009). In this way, SLP allows students to be as independent as possible by only providing the amount of assistance necessary for the student to perform the correct response for each step individually.

Research to Support System of Least Prompts. SLP has been widely researched and is an EBP for students with significant disabilities (Browder et al., 2014; Wolery et al.,1986). SLP is also listed as one of the prompting procedures for the EBP of prompting, which has been found to be effective for students with ASD (Wong et al., 2015). Over time SLP has been reviewed with a critical lens. Researchers have examined the procedural components, relevant student population, types of skills, and determined that this procedure is highly effective. Most recently, Shepley et al. (2019) reviewed over 25 years of research using the SLP response prompting procedure with individuals with disabilities. The review included 123 peer-reviewed studies from the years 1988–2016. Results showed the use of SLP has been used to teach students with a range of ages and eligibility categories, and has been used to teach numerous chained and discrete tasks across many domain areas. Interestingly, this review found SLP to be an EBP only for teaching chained responses related to community, self-care, and vocational skills for

individuals with moderate intellectual disability who were 13 years or older. The researchers also found applications of SLP for play skills (e.g., pretend play; Ulke-Kurkcuoglu, 2015), leisure skills (e.g., making popcorn; Demchak, 1989), academic content (e.g. listening comprehension for science read-alouds; Hudson et al., 2014), social and communication skills (e.g., pretend play and related social exchanges; Barton, 2015), community safety skills (e.g., using a cell phone to get assistance when lost in the community; Taber et al., 2003), daily living (e.g., purchasing, Cihak & Grim, 2008), employment skills (e.g., janitorial tasks of sweeping; Test et al., 1988), behavioral skills (e.g., decrease disruptive behavior; Heckaman et al., 1998), and transitioning between activities (e.g., using tablet based application to follow a schedule; Wu et al., 2016). The researchers noted one of the major limitations to this review is that many studies using SLP were excluded because they were not methodically rigorous and some noneffective research studies were excluded due to publication bias.

Considering SLP is used more frequently to teach chained tasks, researchers are now investigating more intricate details of the SLP procedure by manipulating specific components of the traditional design. For example, Smith et al. (2015) evaluated the effects of a SLP procedure that used a video prompt as the model in the prompting hierarchy to teach office tasks to three high school students with moderate intellectual disability. Sessions were taught in a one-on-one arrangement in the school office of the participants' high school. The SLP procedure was presented with the following three levels of prompts: verbal, video model on an iPhone, and physical prompts while students were performing office tasks (e.g., collate and staple papers, prepare a letter, organize a binder). A multiple probe across behaviors design was used to evaluate the students'

independence with office tasks; results indicated a functional relation for all students between the SLP + video prompting procedure and the percentage of steps completed independently. Participants also were able to generalize the majority of steps to novel materials. Authors emphasized the practical usage of video models within a SLP as opposed to live models because they are less time consuming for instructors and allow for more independence for individuals with disabilities.

The use of SLP has also been shown to assist students with disabilities in transitioning independently between activities in the classroom. Pierce et al. (2013) evaluated the effects of a visual activity schedule (VAS) with SLP on the independent transitioning behavior of four students with moderate ASD in a self-contained classroom. Each student had a VAS book with Boardmaker (1990) images representing four center activities to be completed and had task analytic sentence strips with pictures sequenced in order for the necessary steps for transitioning: stop, clean up, stand up, go to specific center (colored coordinated card with next center). If a student did not respond to the picture cue, the SLP was used as follows: (a) provided a gestural prompt of the teacher touching the next step in the VAS, (b) signed and said the word for the transitional step, and (c) provided a physical prompt with another verbal prompt. Using an ABAB withdrawal across participants design, the researchers analyzed VAS and SLP to increase students' independence during transitions. Results indicated a functional relation between the use of VAS with SLP and the percentage of steps completed independently for all four participants. Additionally, pre-test/post-test data revealed that all participants were able to generalize the use of VAS with novel stimuli and pictures. The researchers

recommended future research for more complex classroom transitions in a variety of school settings.

Summary

There is a substantial body of research to support the use of systematic instruction with students with ESN for a multitude of skills. Specifically, the use of task-analytic instruction and the response prompting procedure SLP have a growing body of research to support their combined use for teaching chained tasks. Many of the studies in the area of systematic instruction are still exclusively conducted in self-contained classrooms or in one-on-one teaching formats. Research has shown constant time delay to be an efficient instructional procedure for students with mild to moderate intellectual disabilities because it is a near-errorless learning method (Horn et al., 2020); however, limited research has been done to determine if SLP is more efficient in terms of duration of time to mastery for students with ESNs. Duration for how long it takes to complete a transitional routine is important because the less time a student spends in a transition can become more time to work on other targeted skill areas. For students with ESN, it is important to continue to evaluate best practices to teach independent skills in inclusive settings such as general education classrooms. Educators are charged with determining which EBPs are best to work synchronously to help support the needs of students with ESN. To maximize instructional efficiency and best utilize time, it is important for educators to use strategies that work well together. By combining EBPs that complement each other, students with ESN are presented with better opportunities to gain independent skills further enriching their educational experience in inclusive general education classrooms by removing the requirement of constant prompting from a paraprofessional.

Combining VSM + SLP as a Multi-Component Intervention

Combining technology with systematic instruction is a growing practice that continues to evolve as new technologies are developed. When used in a general education classroom, instructional technology can allow students with ESN to expand their independent skills and participate with peers in classroom routines without requiring a paraprofessional to do too much for them. The use of video modeling is an EBP for students with disabilities and can be implemented by trained adults to increase students' independence, engagement, and correct performance of regular classroom routines in inclusive settings (Browder et al., 2014; Park et al., 2018). The use of SLP is also an EBP for students with significant disabilities and can be faded over time to decrease high levels of prompt dependence (Browder et al., 2014). Used in conjunction, these can be effective in increasing independence in general education classrooms for students with disabilities.

Cihak et al. (2010) conducted a study to evaluate the efficacy of video modeling delivered via a handheld device (video iPod ®) and the use of SLP for four students with ASD making transitions throughout an elementary school building. Using an ABAB withdrawal design to analyze the percentage of independent transitions before and after the implementation of a video modeling with SLP, results showed all participants were able to transition more independently after the intervention was introduced and the performance decreased when the intervention was withdrawn. A functional relation was established between video modeling and number of independent transitions students with ASD made between locations in a school. Results showed video modeling through portable technology could aid students with ASD make transitions to and from locations

in the school building; however, it did not show the effects of video modeling on within-classroom transitions.

A similar study by Reyes et al. (2020) showed the combination of VSM + SLP to increase independence in completing transitional school routines for a student with ESN in an inclusive classroom. Using a single-case multiple-probe across behaviors design to evaluate the percentage of independent steps completed in each transitional routine following a VSM + SLP intervention, results showed the participant was able to transition more independently within the general education classroom after the intervention was introduced. A functional relation was determined and results showed that VSM can be paired with SLP to increase independent transitioning skills of a student with ESN in an inclusive classroom based on typical transitions seen in lower elementary classrooms.

By reviewing the implications for practice and suggestions for future research from these studies, it is evident that combining two EBPs has promise in improving independent transitioning skills for students with ESN. Having the ability to make successful transitions within the context of an inclusive classroom empowers the students in this area so paraprofessional support is only needed occasionally and can be faded over time. Paraprofessionals need training to be able to implement such interventions with the same fidelity one would expect from a special education teacher. It is also important to take into account the importance of professional wisdom (e.g., one's own knowledge about the target student and the general education classroom) when selecting and implementing combined EBPs to increase efficacy of EBPs and the likelihood of being implemented with fidelity (Cook & Cook, 2011).

General Summary of the Literature

There is a critical need for the use of EBPs in inclusive settings for students with ESN. To support these students, multiple service providers are needed beyond the special education teacher. The responsibility of selecting and implementing EBPs for students with ESN falls on the special education teacher; however, for many students in this population who receive support from a paraprofessional for a majority of their day, it becomes imperative that paraprofessionals implement EBPs with fidelity. EBPs need to be systematically combined to find which work best together as multi-component interventions. The three main components of the intervention, including paraprofessional implementation, VSM, and SLP, were introduced. A brief review of the history of inclusion for students with ESN and the literature was presented. While the field of special education is moving towards more inclusive environments for students with ESN, further work is needed to effectively prepare and support all service providers, including paraprofessionals, in using EBPs to promote independent skills for students with ESN in inclusive settings. By increasing independence in inclusive settings, students with ESN can experience decreased dependence on paraprofessionals and in turn increased personal and social success in inclusive settings, yielding overall more positive student outcomes for independent skills.

CHAPTER 3: METHOD

This multi-component intervention package combined two EBPs for students with ESN to assist in independent completion of transitional routines in inclusive elementary school settings. The purpose of this study was to investigate: (a) the effect of a paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines for an elementary student with ESN in an inclusive setting, (b) the effect of a paraprofessional-implemented VSM + SLP intervention on the duration of transitional routines for an elementary student with ESN in an inclusive setting, (c) to what extent can a paraprofessional deliver the VSM + SLP intervention with procedural fidelity at or over 80%, (d) to what extent is an elementary student with ESN able to generalize the acquired skill of transitioning between classroom activities and locations in the school (e.g., lunch in the classroom vs. in the cafeteria) without the use of VSM + SLP, and (e) to what extent do the student, general education teacher, and paraprofessional rate the use of VSM + SLP as acceptable for facilitating independent transition in an inclusive setting for an elementary student with ESN. This chapter provides detailed information about the participants, setting, materials, variables, data collection, procedures, social validity, and procedural fidelity.

Participants

Utilizing purposeful sampling, an elementary student with ESN was not transitioning independently between tasks and activities in an inclusive elementary school classroom was recruited to participate in this study. The participant was selected based on the following inclusion criteria: (a) diagnosed with a disability, (b) has extensive support needs, (c) in elementary school inclusion classroom, (d) receives frequent prompting

through transitional routines by a paraprofessional, (e) hearing and vision within normal limits, and (f) physical ability to perform steps required for each transition.

Consent forms were provided to parents and/or legal guardians of potential participants prior to the beginning of the study. See Appendix A for the parental consent form. Following receipt of the signed consent form, the lead researcher reviewed student records to assess eligibility and screen the participant based on inclusion criteria. Prior to beginning the screening process, student assent was given by completing the student assent form and giving vocal consent to the lead researcher. See Appendix B for the student assent form.

Screening Procedures

A prescreening assessment was administered to the participant prior to beginning the baseline. The purpose of the prescreening assessment was to identify the present level of performance of the potential participant and to determine if the participant possessed the prerequisite skills required to participate. Skills that were assessed during the assessment and were required for participation including attending to a video with continuous eye gaze, ability to respond to gestural or verbal prompts, and ability to physically perform steps required for each transitional routine targeted for intervention. Skills were assessed through behavioral observations of the participant working with a known paraprofessional. If the participant was able to complete transitional routines independently, he/she would not have been included in this study.

Student Participant

The student in this study was a 9-year-old male in an inclusive second grade general education classroom. Christian was born with a grade one brain bleed, heart

defects, and pulmonary hypertension. He was diagnosed with Down syndrome at three months old and since has had seizures on two occasions due to a pacemaker malfunction. At three years old, his scores on the *Differential Ability Scales–Second Edition* (*DAS–II*; Elliot, 2007) showed that he had the cognitive functioning approximately at the 18 to 20-month level which indicated a delay of greater than 40%. His adaptive behavior skills were assessed to be well below average on that assessment. Additional testing at age seven was incomplete as the report shared that the participant displayed limited ability to follow prompts and provide consistent responding to test items so accurate scores could not be obtained on his IQ test. His composite score on the *Vineland-3 Adaptive Behavior Scales* (*Vineland-3;* Sparrow, 2016*)*, teacher edition was in the range of Intellectual Disability-mild and his parent responses fell within a below average range. In his social developmental history, his mother reported behavioral concerns, which included short attention span, impulsivity, difficulty with academics, and stated that he required "a lot of attention." The psychological report cautioned interpretation of the combined results due to the testing administrator's inability to get valid responses from him on educational and intellectual quotient (IQ) test questions and the testing situation for the responses given were outside the guidelines of standardized testing (i.e., test administrator would offer an incentive after every response of blowing bubbles to entice a response). At that time, his public charter school identified him as eligible for special education services under the area of Other Health Impairment (OHI) noting Down syndrome as his primary diagnosis and labeled him as having to participate in alternate assessment.

Due to the lack of existing formal testing, the lead researcher administered the *Support Intensity Scale-Children's Version* (*SIS-C*; Shrogen et al., 2017) to obtain a

profile of support needs and determine a support needs index score. The *SIS-C* is a standardized assessment and valid means to measure the relative intensity of support needs of children with intellectual and developmental disabilities, between ages 5 to 16. The *SIS-C* is an adaptation from the adult version and has been deemed valid and reliable (Shrogen et al., 2017). The assessment requires interviews with at least two respondents who know the student well and results are strengthen when more people provide input. Christian's interview respondents were his parents, paraprofessional, and the lead researcher who was also the director of the special education program. Both the paraprofessional and the lead researcher/special education director had known the student for one year at the time of the interviews. The *SIS-C* includes two parts: *Part I: Exceptional Medical and Behavioral Needs* and *Part II: Support Needs Scale* (Thompson et al., 2016). The intensity of support need for each medical and behavioral item is measured using a 3-point Likert rating scale (0 = *no support needed*; 1 = *some support needed*; 2 = *extensive support needed*). Christian's scores on Part I of the test were in a range that indicated it was highly likely that he has greater support needs than others with similar SIS-C Support Needs Index because he had high medical and behavioral needs. This meant his scores indicated more extensive support than the average student without high medical and behavioral needs. Within these sections, Christian scored having the highest medical support need for therapy services (i.e., occupational therapy and speech language therapy) and the highest behavioral support need for the prevention of wandering. Interview respondents agreed across all subscales in Part II. The seven sections for support needs were (a) home living, (b) community & neighborhood, (c) school participation, (d) school learning, (e) health & safety, (f) social activities, and (g)

advocacy. Each area is rated across three dimensions: frequency (e.g., how often is extraordinary support needed), time (e.g., how much time by another person is needed to provide extraordinary support), and type (e.g., what is the nature of the extraordinary supports that is provided). Christian's composite score produced a Support Needs Index of 23.2 (Standard Score of 89), meaning that against norms for his age he performed as well as 89% of his peers with intellectual and developmental disabilities. In Part II, the two areas Christian had the highest needs were school participation and school learning. Within the school participation activities section, he was scored as needing the highest level of support for six of the nine areas: (a) being included in general education classes, (b) participating in activities in common school areas (e.g., playgrounds, hallways, cafeteria), (c) getting to school, (d) moving around within the school and transitioning between activities, (e) participating in large scale test taking activities required by the state, (f) keeping track of schedule at school. Within the school learning activities section, he was scored as needing the highest level of support for four of the nine areas: (a) accessing grade level curriculum, (b) learning academic skills, (c) learning and using metacognitive strategies, and (d) completing academic tasks (e.g., time, quality, neatness, organizational skills). Overall the existing data paired with the SIS-C index score qualified the participant as having ESN.

Paraprofessional Participant

The lead interventionist in this study was the paraprofessional who delivered the intervention after receiving training and support on how to deliver the VSM + SLP intervention. The paraprofessional was a 44-year-old white female. She had no prior training in systematic instruction but had worked with the target student for one year

prior to the start of the study. The paraprofessional in the classroom had over 20 years of experience working with young children as a preschool teacher and director. She also had five years of experience as a paraprofessional in an inclusive setting for students with ESN. At the time of the study, she was finishing her final coursework for an associate's degree in early childhood education with a specialization in developmental disabilities.

Setting

The setting was a small, private school in the Southeast United States. Approximately 140 students attended the school in kindergarten through 12th grade. Of the students enrolled, approximately 50.71% of students were White, 41.43% were African American, 2.86% Hispanic, and 0.71% of the student population identified as other. Average tuition for a general education student was approximately $7,000 and tuition for students receiving special education services ranged from approximately $12,000 to $24,000 based on student support needs. At the time of the study there were seven total students receiving special education services within the total school population. Forty-four percent of students attended the school on full or partial scholarships.

The participant received academic instruction from a special education teacher, paraprofessional, and general education teacher in the general education classroom. The classroom consisted of one general education classroom teacher and 19 total students. There were two students with disabilities, one being the participant in this study with ESN and two paraprofessionals, one being the one assigned to the participant in this study with ESN. The participant was also included with his typically developing peers during special area classes (i.e., art, music, physical education), lunch, recess, and special

school events. Intervention sessions took place in the participants' general education classroom during the time allotted for each transitional routine. Sessions were conducted in the natural setting and responding to natural cues for each transitional routine as the whole class was also transitioning. A paraprofessional was trained by the lead researcher, a doctoral candidate studying special education, and implemented all baseline and intervention sessions.

Materials

The materials used included an iPad®, Macbook Pro® laptop, iMovie® Application, and a GoPro® video camera. An iPad® was used to record individual video clips of the participant completing the essential steps for each transitional routine. Next, using a Macbook Pro® laptop and the iMovie® Application, the lead researcher combined individual video clips into one streamlined video without audio for the participant to watch as a VSM. The participant engaged with the iPad® for watching video self-models, showing streamlined videos of himself completing each transitional routine prior to the occurrence of each transitional routine. A GoPro® video camera was used to record all sessions for feedback and training with the paraprofessional as well as for data collection purposes for the secondary data collector.

Experimenter and Interventionist

The lead researcher for this study was a third-year doctoral candidate with over a decade of experience working with students with disabilities as a former special education teacher and inclusive program director. The lead researcher was a licensed in both general and adapted curriculum for special education in the state the study will be conducted. The lead researcher's background has been with students with disabilities in

self-contained, resource, and inclusive settings in both public and private schools. The lead researcher served as the trainer and the primary data collector. Additionally, a first year graduate student in the doctoral program at UNC Charlotte assisted in procedural fidelity and secondary data collection.

Experimental Design

A single-case multiple probe across behaviors design (Ledford & Gast, 2018; Horner & Baer, 1978) was used in this study with one participant for the percentage of steps completed independently for each transitional routine. The participant entered baseline at the beginning of the study for all three transitional routines at the same time. The transitional routine the participant was least independent with was the first behavior targeted for intervention. A minimum of five data points were collected during baseline, and after a stable trend was observed, the first behavior moved into the intervention phase. During this time, the remaining behaviors stayed in baseline. Intermittent baseline probes were administered at a minimum of every fourth session and concurrently as each behavior moved into the intervention phase.

Data were collected daily during each session, or transitional routine. Each of the three transitional routines had a varying total of essential steps to be completed in order (i.e., morning work to leisure had 10 steps but packing up for lunch had 13 steps). A step was counted as "completed" or "not completed" and coded as "completed independently" or "needed prompting" (noting the level of prompting used during SLP). See Appendix I for transitional steps for each routine. The lead researcher graphed the percentage of independently completed steps in each transitional routine for each phase: baseline, intervention, fading, and maintenance. Following the intervention phase, fading

procedures were implemented for all transitional routines. Maintenance data were collected on the first transitional routine, morning work to leisure, until the end of the study across all three transitional routines. Visual analysis was used to determine trends, changes in level, and functional relations between the independent and dependent variables. See Figure 2 for the graph.

Once the participant's data showed an increasing trend for the first behavior and met mastery criteria (100%) for the number of independently completed steps in a transitional routine across two consecutive sessions or two out of three sessions, the behavior was moved into a fading phase and the second behavior moved to the intervention phase. This systematic process continued until all of the behaviors were in the fading or maintenance phase. Additionally, a generalization probe was taken twice before and five times after the intervention measuring the number of independently completed steps for a similar transitional routine (i.e., packing up at the end of lunch in the classroom vs. in the cafeteria).

Dependent Variables

Two dependent variables were measured in this study. The dependent variables included (a) independent completion of transitional routines and (b) duration of transitional routines. Other measures included paraprofessional implementation fidelity and teacher and student perception. The first dependent variable, independent completion of transitional routines, was experimental because student performance changed in response to the introduction of the intervention. For duration this was not the case; therefore, this dependent variable could not be analyzed experimentally.

Independent Completion of Transitional Routines. The primary dependent variable related to the completion of transitional routines was measured by the number and percentage of steps completed independently using a task analysis for the essential steps required for a transition to be considered complete. The variable was recorded as percentage of steps completed independently in a transitional school routine in classroom/school settings and the percentage of steps completed independently in a transitional routine in a different location/setting. A transitional routine was defined as when the participant completed the essential steps needed to move to another activity or task independent of adult prompting. Three transitional routines were used for this study, including: (a) transitioning from morning work to leisure (e.g., putting away completed morning work in a turn-it-in bin and getting a 'brain break' bin to take to his desk), (b) moving from phonics to mathematics (e.g., putting away guided practice phonics work and getting mathematics materials to go to a different location in the building for mathematics), and (c) packing up lunch (e.g., putting away all lunch items in appropriate places at the end of lunch). The number of correct steps completed independently were measured using event recording for the total number of steps completed independently out of the total essential steps in the transitional routine and converted to percentage scores for each session by totaling the number of steps completed independently over the total number steps required for each transition. Only steps that were done independently within the time limits of each step by participants were counted as complete. During intervention, data also were collected on the level of prompting required during each session according to the SLP procedures. These data were used to show if the participant

gained more independence with the steps throughout the intervention. See Appendix C for the data collection form.

Duration of Transitional Routines. Another dependent variable in this study was the duration of time it took the participant to complete each transitional routine. The variable was recorded using duration recording to calculate the total amount of time it took for the participant to complete the transition. These data were used to determine whether the total time to complete the transition decreased over time. See Appendix C for the data collection form.

Additional Measures

Paraprofessional Implementation of VSM + SLP. Procedural fidelity data were collected to show the accuracy of implementation of the intervention by the paraprofessional. These data were used to show the extent to which the paraprofessional delivered the VSM + SLP intervention as designed. Procedural fidelity was gathered by using a procedural checklist for the presentation of the iPad® with the VSM on the screen matching with the transitional routine occurring. Separate data were recorded on the use of SLP for each step of the transition in each phase. The paraprofessional was observed to determine if she waited the appropriate amount of time (e.g., five to ten seconds) between each prompt in the SLP hierarchy. Other elements that were checked through the procedural fidelity checklist included whether the paraprofessional delivered the prompts in the hierarchy and reinforcement contingent on correct responding. The intervention was only considered as being implemented with fidelity if it was implemented with at least 80% accuracy over the total number of sessions. See Appendix D for the procedural fidelity form.

Teacher and Student Perceptions. Teacher and student perceptions were measured using social validity questionnaires provided to the general education teacher, paraprofessional, and participant. Social validity data w collected to measure the opinion of the social acceptability and feasibility of the intervention procedures and the short-term and extended outcomes and goals. It was measured by using a social validity questionnaire completed by the general education classroom teacher, paraprofessional, and participant. The teacher and paraprofessional questionnaires consisted of five questions based on a 5-point Likert-type scale which ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). See Appendix E for the general education teacher and paraprofessional social validity questionnaire. The participant questionnaire consisted of five questions, read aloud, with "yes" or "no" answers represented by a "thumbs up" icon or a "thumbs down" icon. The lead researcher utilized a dictate-to-scribe and gestural pointing format for responses, which were then be recorded on the written questionnaire sheet. Social validity was collected from the teacher and paraprofessional asking their approval level regarding feasibility of the procedures and student outcomes following the VSM + SLP intervention. It was also collected from the participant to determine if the student felt the VSM + SLP intervention helped him achieve his goals, how he like the procedures, and his response to the outcomes as a result of using the intervention. See Appendix F for the student social validity questionnaire.

Procedural Reliability and Fidelity

To ensure the reliability and fidelity across all phases of the intervention, intervention sessions were video recorded and a trained secondary observer scored each session for interobserver agreement (IOA) and procedural fidelity. Using the steps listed

for each transitional routine, the trained secondary observer collected reliability and fidelity data on the same procedural fidelity form used throughout the intervention for the paraprofessional's implementation of the intervention. See Appendix D for the procedural fidelity form. Midway through the study, roles were switched and the first-year doctoral student took over primary observations and data collection while the lead researcher was on maternity leave and collected interobserver agreement and procedural fidelity.

Interobserver Agreement

IOA on all dependent variables was completed to measure the reliability of the dependent measure using the same data sheet the lead researcher used during the intervention phases. A secondary data collector was trained by the lead researcher prior to the start of the first intervention phase with at least three trials to compare data recordings of observed behavior and retraining if agreement fell below 80%. Further, IOA training included double scoring multiple videos of the participant during each phase completing transitional routines and comparing for discrepancies in recorded levels of independence for each step observed. After coding the lead researcher and secondary data collector discussed discrepancies in coding and reached a consensus on the appropriate code to select. Interobserver agreement was calculated using item-by-item method dividing the total number of agreements by the total number of disagreements and multiplied for a total percentage (Cooper et al., 2020). Interobserver agreement was conducted for a minimum of 30% of the baseline, intervention, fading, maintenance and generalization sessions. To ensure the reliability of the dependent measure, 46.6% intervention sessions were observed a secondary data collector, who calculated the interobserver agreement.

Procedural Fidelity

Procedural fidelity on the implementation of the VSM + SLP intervention was collected using a procedural checklist for the presentation of the iPad® with the VSM on the screen matching with the transitional routine occurring. Separate data were recorded on the use of SLP for each step of the transition in each phase. Procedural fidelity was calculated for a minimum of 30% of the intervention sessions across each transitional routine. To ensure reliability of procedural fidelity, 46.6% intervention sessions were observed by a secondary data collector, who calculated procedural fidelity.

Procedures

Baseline

During baseline the lead researcher asked the general education classroom teacher and peers not to prompt the participant during transitions between tasks and activities. Typically this is business as usual but occasionally the peers would give verbal prompts to Christian or complete steps for him during classroom transitions. Using a multiple opportunity method, allowing the participant a chance to perform each step even if he did not complete the one prior, the paraprofessional was trained to complete the step for the participant if the step was not completed within the guidelines of how long that step should take to complete (i.e., closing his morning work folder should take no more than five seconds, as determined by behavioral observations of typically developing students in the classroom). If steps in the transitional routine were completed for the participant, then that step was not counted as being done independently; however, each step was a new opportunity for the participant to complete it independently. The lead researcher collected data for the total number of steps completed independently for each of the three

transitional routines across five baseline sessions. After the fifth baseline session, and at least every fourth session following, an additional probe was administered for the behaviors that had not yet moved to the intervention phase.

Pre-intervention

Prior to the start of the intervention, an informal preference assessment was conducted to determine what type of reinforcement to deliver (e.g., praise or tangible). Additionally, the lead researcher recorded the participant performing the steps of each transition in isolation with maximum prompting needed to get a short video clip of each step. These recordings were done in isolation and out of order to prevent the participant from learning them through repeated practice with maximum levels of prompting and adult attention as a reinforcer. The lead researcher combined these short video clips using iMovie® on a MacBook Pro® laptop into one streamlined video of the participant completing the steps for each transitional routine in order and stored it in the photos application on an iPad®. Additionally, prior to the start of the intervention, the lead researcher used BST to train the paraprofessional how to implement the VSM + SLP intervention. The lead researcher followed the steps of BST for training the paraprofessional, (a) provided rationale for using the VSM + SLP intervention, (b) vocally described steps of using the VSM + SLP intervention, (c) provided paraprofessional with written summary of the steps to implement the VSM + SLP intervention, (d) demonstrated the VSM + SLP intervention [with a general education peer], (e) had the paraprofessional practice the VSM + SLP intervention [with a general education peer], (f) observed and record paraprofessional correct vs. incorrect performance of implementing the VSM + SLP intervention, (g) provided supportive and

corrective feedback, and (h) repeated steps e, f, and g until the lead researcher was confident the paraprofessional could deliver the intervention with procedural fidelity at 80% or higher (Parsons et al., 2013). Specifically, the lead researcher provided modeling for how to use iPad® to watch the video models prior to an upcoming transitional routine and how to use a SLP to prompt the participant through the task analysis. The lead researcher also provided explicit examples and non-examples of the desired behavior of the paraprofessional regarding presentation of materials and prompting levels. If the paraprofessional's procedural fidelity dropped below 80% in intervention, then retraining was implemented by reinstating elements of BST. This only occurred for seven sessions, in which BST was reinstated including a review of instructions, modeling, rehearsal, and feedback.

Intervention

The independent variable was the paraprofessional-implemented VSM + SLP intervention. During the intervention phase, the participant watched VSMs with a complete sequence of the upcoming transitional routine prior to the opportunity to perform the steps independently. The paraprofessional provided an attentional cue (e.g., saying the participant's name) and said, "Time to watch the video of you [insert name of transitional routine here]." The participant was given an iPad® with edited videos showing him completing each of the transitions. The participant then watched a video self-model, lasting less than one minute, of himself completing a transitional routine.

At the start of each transition, the general education teacher or paraprofessional gave an instructional cue to the whole class or to him (e.g., "Turn in your morning work when you are finished."). The paraprofessional observed the participant to see if he

performed the steps of each transitional routine independently. If he did not perform a step independently, then a prompt following the SLP hierarchy was used in the following order: gestural (pointing to the targeted step location or materials), verbal (stating the targeted step aloud), model via video (showing only the targeted step using a video clip), and partial physical prompt (gentle hand over hand to complete the targeted step). The participant was given the opportunity to perform each step independently even if previous steps were prompted or not completed. Due to the need for interobserver agreement by a secondary data collector, sessions were videotaped and the secondary data collector recorded participant performance after the session was complete if she could not observe every session in person. The response interval was 1:1, for each correct response the paraprofessional delivered reinforcement. The participant received reinforcement for all prompted and unprompted responses, but more robust and energetic reinforcement praise was delivered for correct and independent responses. Mastery for each phase of the intervention was achieved when the participant completed 100% of the steps independently for two consecutive sessions or two out of three sessions.

Generalization

Generalization probes measured the participant's ability to generalize the skill of independently completing the steps in a transitional routine without the use of the VSM + SLP intervention in a different setting (e.g., packing up at the end of lunch in the classroom vs. cafeteria) for a similar routine. Procedures during generalization were the same as baseline. Five generalization probes were conducted for the packing up after lunch transitional routine following intervention.

Fading Reinforcement

After a high-level and stable trend of at least five data points were shown in the intervention phase, the lead research faded the intervention by adjusting the paraprofessional's delivery of reinforcement from continuous reinforcement to intermittent reinforcement. Additionally, during the fading phases, the participant was not shown a video self-model prior to the transition and the paraprofessional did not deliver SLP across each step of the transitional routine. Similar to baseline and intervention phases, fading procedures allowed the participant multiple opportunities to perform each step independently because the paraprofessional completed any steps not attempted or steps that were not complete within the time limit. These were not counted as independent and the paraprofessional would wait 5-10 seconds between steps to see if the participant would attempt the next step.

Continuous Schedule of Reinforcement. During this first phase of fading, the paraprofessional was trained to deliver a continuous schedule of reinforcement (CRF) for the participant. The CRF procedure involved the paraprofessional delivering reinforcement after every step of the transitional routine was completed independently (Cooper et al., 2020). CRF procedures were used across all three transitions and reinforcement was delivered with a fixed ratio of 1:1.

Intermittent Reinforcement Schedule. Following a high-level and stable trend the second phase of fading began in which the paraprofessional delivered an intermittent schedule of reinforcement (INT). The INT procedure involved the paraprofessional delivering reinforcement after some of the steps in the transitional routine were completed independently but not after each one (Cooper et al., 2019). The target ratio of

reinforcement was a variable ratio of at least half of the steps being reinforced. INT procedures were only used for the morning work to leisure transition between the CRF and maintenance phases.

Maintenance

Maintenance occurred following the fading phases to measure the participant's ability to maintain independence through the total steps of a transitional routine after the VSM + SLP intervention was removed and reinforcement was only delivered at the end of a complete independent transition. Three maintenance probes were conducted following intervention with at least two days in between for the morning work to leisure transitional routine. Previous baseline sessions collected data at least every four days and intervention was every day that there was school without special event disruptions or student absences.

CHAPTER 4: RESULTS

This study investigated the effects of a paraprofessional-implemented video self-modeling (VSM) and system of least prompts (SLP) intervention on independent completion of transitional routines for a student with ESN in inclusive settings. Results showed a functional relation between the VSM + SLP intervention and independent completion of transitional routines. Additionally, the paraprofessional received Behavioral Skills Training (BST) and implemented the VSM + SLP intervention with high fidelity. Moderate levels of generalization of independent transitioning skills for transitional routines were observed.

Interobserver Agreement

A secondary observer collected interobserver agreement (IOA) data using permanent product (video) observations and the data collection form (see Appendix E) for a minimum of 30% of all sessions in each phase across each transitional routine. IOA was conducted using an item-by-item analysis in which the number of agreements on steps completed was divided by the total number of agreements and disagreements multiplied by 100 (Cooper et al., 2020). Data indicated the mean IOA across all transitional routines was 96.0% (range: 78%–100%) during baseline, 94.9% (range: 80%–100%) during intervention, 97.3% (range: 80%–100%) during fading and maintenance, and 100% during generalization. The transitional routines observed were morning work to leisure, phonics to mathematics, and packing up for lunch.

Morning Work to Leisure

A secondary observer collected IOA data on the student's performance of transitional routines during 42.9% (3 out of 7 sessions) of baseline sessions, 36.8% (7 out

of 19 sessions) of intervention sessions, and 38.5% (5 out of 13 sessions) of fading and maintenance sessions. IOA across baseline sessions indicated 96.7% agreement (range 90%–100%). IOA across intervention sessions indicated 88.6% agreement (range 80%–100%). IOA across fading and maintenance sessions indicated 92.0% (range 80%–100%) agreement.

Phonics to Mathematics

A secondary observer collected IOA data on the student participant's performance of transitional routines during 40.0% (4 out of 10 sessions) of baseline sessions, 42.9% (9 out of 21 sessions) of intervention sessions, and 50.0% (4 out of 8 sessions) of fading. IOA across baseline sessions indicated 94.5% agreement (range 78%–100%). IOA across intervention sessions indicated 98.8% agreement (range 89%–100%). IOA across fading and maintenance sessions indicated 100% agreement (range 100%).

Packing Up Lunch

A secondary observer collected IOA data on the student's performance of transitional routines during 33.3% (5 out of 15 sessions) of baseline sessions, 60% (3 out of 5 sessions) of intervention sessions, and 50.0% (2 out of 4 sessions) of fading. IOA across baseline sessions indicated 96.9% agreement (range 92%–100%). IOA across intervention sessions indicated 97.4% agreement (range 92%–100%). IOA across fading and maintenance sessions indicated 100% agreement (range 100%). A secondary observer collected IOA data on the student's performance during 42.9% (3 out of 7 sessions) of generalization sessions. IOA across generalization sessions indicated 100% agreement (range 100%).

Table 1:

Interobserver agreement

	Baseline	Intervention	Fading Procedures
Morning Work to Leisure	Range: 90%–100% Mean: 96.7%	Range: 80%–100% Mean: 88.6%	Range: 80%–100% Mean: 92.0%
Phonics to Mathematics	Range: 78%–100% Mean: 94.5%	Range: 89%–100% Mean: 98.8%	Range: 100% Mean: 100%
Packing Up Lunch	Range: 92%–100% Mean: 96.9%	Range: 92%–100% Mean: 97.4%	Range: 100% Mean: 100%
Generalization		Range: 100% Mean: 100%	

Procedural Fidelity

To verify the degree to which the intervention package was implemented as designed, a secondary observer assessed procedural fidelity across a minimum of 30% of sessions across each phase of the intervention for each transitional routine. Procedural fidelity data were collected on the implementation of the VSM + SLP intervention. Procedural fidelity data were collected using permanent product (video) recording and the procedural fidelity form (see Appendix F) utilized throughout the implementation. Procedural fidelity was calculated on the paraprofessional's implementation of the VSM + SLP intervention by dividing the number of steps performed correctly by the paraprofessional by the total number of opportunities for SLP procedures for each step on the checklist and multiplying by 100.

Baseline

Procedural fidelity data were collected by a second observer on the paraprofessional's implementation of procedures during 42.9% (3 out of 7 sessions) of baseline sessions for the *morning work to leisure* transitional routine, 40.0% (4 out of 10 sessions) of baseline sessions for the *phonics to mathematics* transitional routine, and 33.3% (5 out of 15 sessions) of baseline sessions for the *packing up lunch* transitional routine. Intervention session procedural fidelity was collected for 36.8% (7 out of 19 sessions) of the sessions for the *morning work to leisure* transitional routine. IOA across baseline sessions indicated 91% agreement (range 71%–100%).

Intervention

A second observer collected IOA data on the paraprofessional's implementation of procedures during 36.8% (7 out of 19 sessions) of intervention sessions for the *morning work to leisure* transitional routine, 42.9% (9 out of 21 sessions) of intervention sessions for the *phonics to mathematics* transitional routine, and 60% (3 out of 5 sessions) of intervention sessions for the *packing up lunch* transitional routine. IOA across intervention sessions indicated 98.3% agreement (range 93%–100%).

Fading, Maintenance, and Generalization

A second observer collected IOA data on the paraprofessional's implementation of procedures during 38.5% (5 out of 13 sessions) of fading and maintenance sessions for the *morning work to leisure* transitional routine, 50.0% (4 out of 8 sessions) of fading for the *phonics to mathematics* transitional routine, and 50.0% (2 out of 4 sessions) of fading for the *packing up lunch* transitional routine. IOA across fading and maintenance sessions indicated 95.3% agreement (range 74%–100%). A second observer collected IOA data on

the paraprofessional's implementation of procedures during 42.9% (3 out of 7 sessions) of generalization sessions. IOA across generalization sessions indicated 100% agreement (range 100%).

Table 2:

Interobserver agreement on procedural fidelity

	Baseline	Intervention	Fading Procedures
Morning Work to Leisure	Range: 77%–96% Mean: 88.7%	Range: 93%–100% Mean: 97.0%	Range: 74%–100% Mean: 91.8%
Phonics to Mathematics	Range: 71%–100% Mean: 89.0%	Range: 91%–100% Mean: 97.9%	Range: 100% Mean: 100%
Packing Up Lunch	Range: 89%–100% Mean: 95.3%	Range: 100% Mean: 100%	Range: 94% Mean: 94%
Generalization		Range: 100% Mean: 100%	

Results for Question 1: What is the effect of a paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines for an elementary student with ESN in an inclusive setting?

Figure 2 shows the effects of the paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines. The graph shows the percentage of steps performed independently for each transitional routine. During baseline there were stable, low level trends for two out of the three transitional routines, *phonics to mathematics* and *packing up for lunch.* In baseline, there was an increasing trend that leveled out prior to the start of intervention for *morning work to leisure*. During intervention all three transitional routines showed the participant's

independent transitioning changed to a high level or had an increasing trend, with no overlapping data with baseline performance. Visual analysis of the graph indicated a functional relation between the paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines

Morning Work to Leisure

During the seven baseline probes, Christian's performance for independently completing steps in the *morning work to leisure* transition began with a stable, low-level trend for the first three baseline probes with percentages ranging from 20% to 22% (*M* = 20.7%). The next four baseline probes showed a slightly higher level trend that remained stable, without an increasing trend, prior to the start of the intervention with percentages ranging from 40% to 50% (*M* = 46%). Total percentages in baseline ranged from 20–50% (*M*= 35.1%). After the VSM + SLP intervention, an immediate effect was observed with a slight change in level and overall gradual increasing trend was observed with less variability in the data over time. There was no overlap in data across phases. During the intervention there were several steps that naturally chained together and thus Christian did these more consistently over the course of the intervention (e.g., opening his morning work folder, putting his paper away in his morning work folder, and then closing the folder). Christian's performance for completing steps in the *morning work to leisure* transition during the intervention phase ranged from 70% to 100% (*M* = 88.4%). After seven sessions, Christian met mastery criteria of 100% for two consecutive sessions; however, due to the variability in the data path the lead researcher continued to collect intervention data until a stable trend was observed before starting fading and maintenance procedures. There were two fading procedures used following the intervention for the

morning work to leisure transition. During the first fading procedure, CRF, consisting of seven sessions, Christian's performance remained high level but with more variability than the stability previously seen at the end of the intervention phase with percentages ranging from 78–100% (*M*= 89.7%). Although, three of the data points showed mastery at 100% which was more frequent mastery than seen in intervention. During the second fading procedure, INT, consisting of three sessions, Christian's performance continued to show a high level, stable trend with percentages ranging from 78%–100% (*M*= 93.3%). During maintenance, Christian's performance was at a slightly lower level and had some variability with percentages ranging 78%–100% (*M*= 80%). Christian's performance for fading and maintenance procedures combined was high level for four consecutive weeks.

Phonics to Mathematics

During the 10 baseline sessions, Christian's performance for independently completing steps in the *phonics to mathematics* transitional routine showed a stable, low-level trend with percentages ranging from 0% to 22% (*M* = 7.7%). After the VSM + SLP intervention, an immediate effect was observed with a slight change in level and overall gradual increasing trend was observed with less variability in the data over time with percentages ranging from 67% to 100% (*M* = 85%). There was no overlap in data across phases. The data path for this transition visually shows more variable data; however, this was due to the lower number of steps in this transitional routine that affect the denominator to calculate the percentage of steps completed independently. After 10 sessions, Christian met mastery criteria of 100% for two consecutive sessions and fading procedures began. The fading procedure used to measure maintenance, CRF, showed Christian's performance remained at a high level with a variable trend and percentages

ranged from 22%–89% (*M*= 73.8%) for two consecutive weeks. During these two weeks there was one outlier data point that was significantly lower than the rest of the data path for the CRF phase. This lower data point was reflected across all three transitional routines on the same day and the paraprofessional reported anecdotally Christian seemed "off" that day. He exhibited problem behaviors that day (i.e., swiping and hitting) that were previously deemed extinct as a result of a successful behavior plan from last school year. His mother also reported he had little sleep the night before and "warned" the paraprofessional to look out for challenging behaviors. On the day following the lower data point he returned to higher levels of performance for the duration of the CRF phase. If this outlier was removed from the data set, then the percentages of steps completed independently during CRF would range from 67%–100% (*M*= 81.1%).

Packing up Lunch

During the 15 baseline sessions, Christian's performance for independently completing steps in the *packing up lunch* transitional routine showed a stable, low-level trend with percentages ranging from 0% to 42% (*M* = 19.7%). After the VSM + SLP intervention, an immediate effect was observed with change in level to a high level, stable trend with percentages ranging from 91% to 100% (*M* = 98.2%). With this transition being the last to enter the intervention phase, the baseline phase was longer than the intervention phase. Additionally, the immediacy of effect was also strongest for this transition with the highest jump in levels. This may have been due to the fact that Christian had more practice with the VSM + SLP procedures from the other transitions prior to entering the intervention phase for this transition. In fact, after only one session Christian met mastery criteria of 100% continued at 100% for the rest of the intervention

phase. The fading procedure used to measure maintenance, CRF, showed Christian's performance stayed at a high level with a stable trend with percentages ranged from 70%–82% (*M*= 78%) for 4 consecutive sessions. His performance in the CRF phase was slightly lower than his performance in intervention but was still at a higher level than baseline.

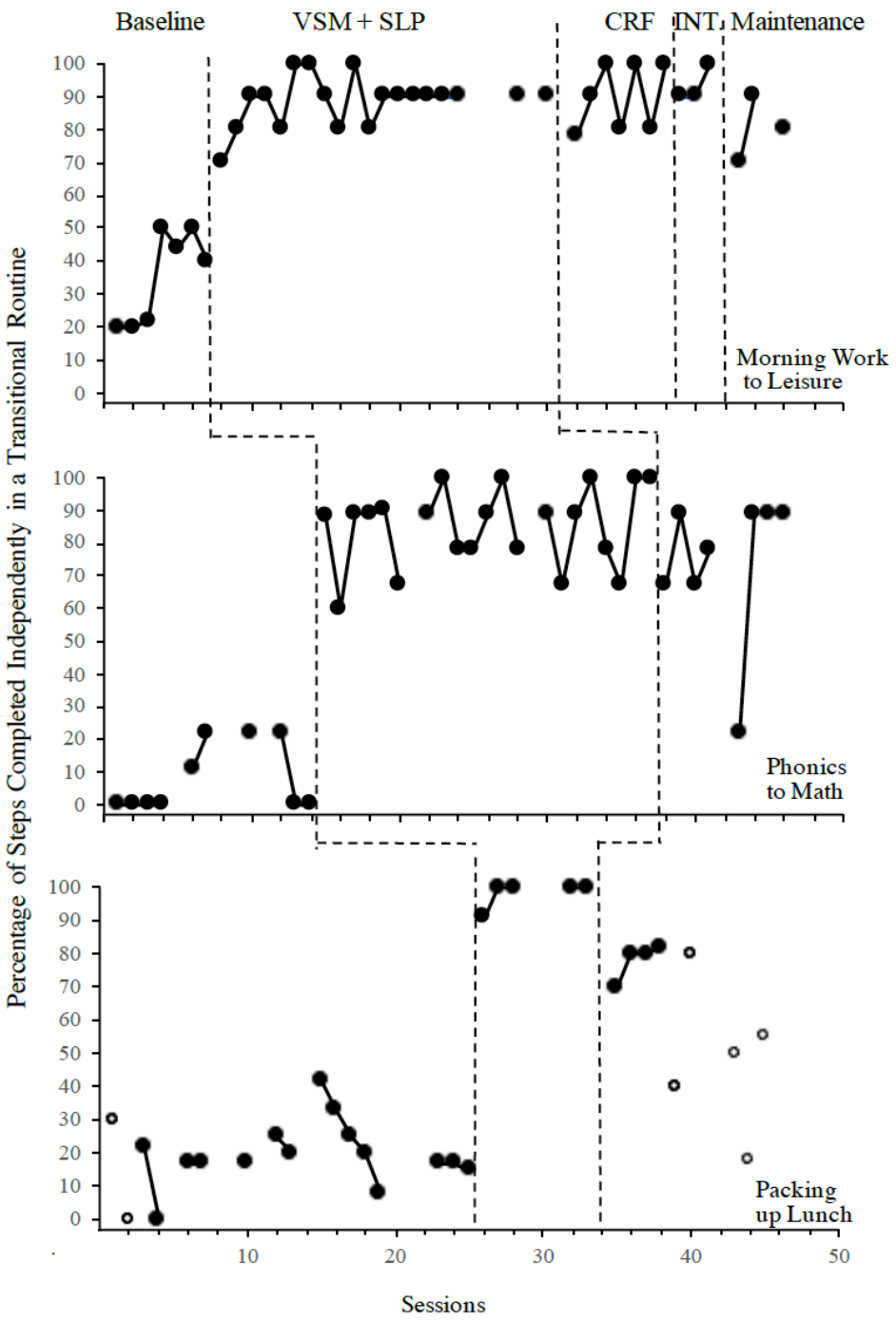

Figure 2. Graph of the percentage of steps completed independently for each transitional routine. CRF indicates student performance when a continuous schedule of reinforcement was used. INT indicates student performance when an intermittent schedule of reinforcement was used.

Results for Question 2: What is the effect of a paraprofessional-implemented VSM + SLP intervention on the duration of transitional routines for an elementary student with ESN in an inclusive setting?

Table 1 shows the effects of the paraprofessional-implemented VSM + SLP intervention on the duration of transitional routines. Duration was recorded as the amount of elapsed time from the initiation of a transitional routine, given as a natural cue from the general education teacher or paraprofessional, until all the steps for each transitional routine were complete. The table shows the time in minutes and seconds for each transitional routine across phases. During intervention all three transitional routines showed the participant's ability to complete the targeted transitional routines independently in less time than in baseline. It is important to note the baseline procedures used were multiple opportunity to perform; thus, the paraprofessional completed a step for the participant if he did not attempt the step within 5–10 seconds. In doing so, the duration for baseline was shorter than observations prior to beginning baseline where conditions were *business as usual*, in which the participant was prompted multiple times using a variety of prompting levels or simply completed steps for him. It would be expected that the true duration of each transition before the VSM + SLP was much longer than what was captured in baseline data.

Morning Work to Leisure

The duration of time elapsed in baseline for the *morning work to leisure* transition ranged from 1min 23s to 2mins and 35s (*M* = 1min 52s). During the VSM + SLP intervention the duration of the *morning work to leisure* decreased, ranging from 35s to 2 mins 2s (*M* = 1 min 18s). During fading and maintenance procedures the duration of the

morning work to leisure transition was similar to in intervention and ranged from 48s to 2 mins 10s (*M*= 1 min 14s).

Phonics to Mathematics

The duration of time elapsed in baseline for the *phonics to mathematics* transition ranged from 1 min 53s to 2 min 46s (*M* = 2 mins 31s). During the VSM + SLP intervention the duration of the *phonics to mathematics* transition decreased, ranging from 51s to 2 mins (*M* = 1 min 32s). During fading/maintenance procedures the duration of the *phonics to mathematics* transition averaged to be the same as in intervention and ranged from 40s to 2 mins 16s (*M*= 1 min 32s).

Packing Up Lunch

The duration of time elapsed in baseline for the *packing up lunch* transition ranged from 1 min 51s to 3 mins 32s (*M* = 2 mins 41s). During the VSM + SLP intervention the duration of the *packing up lunch* transition decreased, ranging from 1 min 11s to 1min 54s (*M* = 1 min 48s). During fading/maintenance procedures the duration of the *packing up lunch* transition increased back to baseline levels and ranged from 1 min 28s to 2 mins 42s (*M*= 2 mins 42s). Duration for this transitional routine may have returned to baseline times after intervention because during intervention he was at almost 100% mastery for every session and during fading/maintenance he was at lower levels of independence overall. He was as efficient as possible during intervention with all steps being completed quickly with little lag time in between than during fading/maintenance where he was not fully successful with independent transition. During fading/maintenance the paraprofessional had to wait 5–10 seconds between each step to give him a chance to complete it on his own and when he did not, that added to his

overall duration; whereas, in intervention there was no lag time between the steps and the paraprofessional did not have to wait on him to see if he would compete the next one.

Generalization

The duration of time elapsed for the *packing up lunch* transitional routine across two generalization sessions in baseline ranged from 2 min 12s to 2 mins 31s (*M* = 2 mins 36s). After the VSM + SLP intervention and fading procedures were removed, the duration of the *packing up lunch* transitional routine across five generalization sessions decreased slightly, ranging from 1 min 13s to 3 mins (*M* = 2 mins 4s). Although the duration decreased some, Christian's percentage of steps completed independently also decreased during this transition in generalization.

Table 3:

Average duration of transitional routines

	Baseline	Intervention	Fading Procedures
Morning Work to Leisure	Range: 1:23– 2:35 Mean: 1:52	Range: 0:35– 2:02 Mean: 1:18	Range: 0:48– 2:10 Mean: 1:14
Phonics to Mathematics	Range: 1:53– 2:46 Mean: 2:31	Range: 0:51– 2:00 Mean: 1:32	Range: 0:40– 2:16 Mean: 1:32
Packing Up Lunch	Range: 1:51– 3:32 Mean: 2:41	Range: 1:11– 1:54 Mean: 1:48	Range: 1:28– 2:42 Mean: 2:42
Generalization	Baseline Range: 2:12–2:31 Mean: 2:36		Intervention Range: 1:13–3:00 Mean: 2:04

Results for Question 3: Following BST, to what extent can a paraprofessional deliver the VSM + SLP intervention with procedural fidelity at or over 80%?

Table 1 shows procedural fidelity data on the paraprofessional's implementation of the procedures across all transitional routines and phases. In baseline, the paraprofessional followed different procedures than in intervention, and the procedures for the paraprofessional changed again for fading, maintenance, and generalization. Each phase involved BST with the lead researcher and secondary data collector. As part of BST, the paraprofessional was given written directions at the start of a new phase followed by modeling, rehearsal, and feedback. Feedback was given initially through gestural responses from the lead researcher so the paraprofessional knew if she was on target. Additional feedback was given as needed following a session where procedures were not correctly so the paraprofessional could have a chance to do better for the next session. The paraprofessional was eager to do well with the procedures and often asked questions to elicit feedback from the lead researcher and secondary data collector to clarify any misunderstandings she had. She was very responsive to feedback and made changes accordingly in response. Paraprofessional implementation of the VSM + SLP intervention across all three transitional routines averaged above 80% for the throughout the study.

Baseline

Procedural fidelity data were collected by a second observer during 100% of baseline sessions for the *morning work to leisure* transitional routine (7 out of 7 sessions), 100 % of baseline sessions for the *phonics to mathematics* transitional routine (10 out of 10 sessions), and 100% of baseline sessions for the *packing up for lunch* transitional

routine (11 out of 11 sessions). The mean procedural fidelity for all transitional routines in baseline was 93.8% (range 72%–100%).

Intervention

Procedural fidelity data were collected by a second observer during 100% of intervention sessions for the *morning work to leisure* transitional routine (19 out of 19 sessions), 100 % of intervention sessions for the *phonics to mathematics* transitional routine (21 out of 21 sessions), and 100% of intervention sessions for the *packing up for lunch* transitional routine (5 out of 5 sessions). Mean procedural fidelity for all three transitional routines during intervention was 89.5% (range: 74%–100%) during intervention.

Fading, Maintenance, and Generalization

Procedural fidelity data were collected by a second observer during 100% of fading and maintenance sessions for the *morning work to leisure* transitional routine (13 out of 13 sessions), 100% of fading and maintenance sessions for the *phonics to mathematics* transitional routine (8 out of 8 sessions), and 75.0% of fading and maintenance sessions for the *packing up for lunch* transitional routine (3 out of 4 sessions). Mean procedural fidelity for all three transitional routines during fading and maintenance was 90.6% (range: 76%–100%) during fading and maintenance. Procedural fidelity data were collected by a second observer during 100% of generalization sessions (7 out of 7 sessions). Mean procedural fidelity for generalization was 92.0% (range: 70%–100%).

Table 4:

Procedural fidelity of paraprofessional implementation

	Baseline	Intervention	Fading Procedures
Morning Work to Leisure	Range: 90%–100% Mean: 95.7%	Range: 77%–100% Mean: 88.0%	Range: 83%–100% Mean: 95.8%
Phonics to Mathematics	Range: 72%–100% Mean: 88.3%	Range: 74%–100% Mean: 95.0%	Range: 89%–100% Mean: 94.7%
Packing Up Lunch	Range: 87%–100% Mean: 97.3%	Range: 84%–90% Mean: 85.6%	Range: 76%–86% Mean: 81.3%
Generalization		Range: 70%–100% Mean: 92.0%	

Results for Question 4: To what extent is an elementary student with ESN able to generalize the acquired skill of completing transitions independently in different inclusive locations within the school (e.g., lunch in the classroom vs. in the cafeteria) the use of VSM + SLP?

Figure 2 shows the effects of the paraprofessional-implemented VSM + SLP intervention on the percentage of steps completed independently in transitional routines. Specifically, the graph indicates the extent to which the participant in this study was able to generalize the acquired the skill of completing transitions independently for one of the transitional routines, *packing up lunch* in a different setting when the VSM + SLP intervention and fading supports were removed. Generalization data were collected twice in baseline conditions and five times after intervention. Baseline generalization data were collected to confirm the participant did not already have transitioning skills in the other setting and post-intervention, generalization data were collected to examine the extent to

which his skills were generalized in the other setting. During this study the school had just moved to a new campus a week prior to the school year beginning and not all common areas were built at the start of the study. During baseline, intervention, and fading/maintenance sessions data were collected in the second grade classroom where students ate lunch while the cafeteria was being built; however, generalization was measured for the *packing up lunch* transition in the school lobby area for baseline and after the intervention was removed in the finished cafeteria. Both generalization sessions in baseline and after intervention were similar in that they were both in a common area with multiple students sitting at tables as opposed to the singular desk format of eating in the classroom. Data collection changed for the *packing up lunch* transition went straight from CRF conditions to generalization because the school finished building a cafeteria and the students were no longer eating in their rooms. It would have been ideal to have maintenance in the original eating in the classroom setting before measuring generalization in the cafeteria setting. Christian's independent completion of steps for the *packing up lunch* transitional routine across two generalization sessions in baseline ranged from 0%–3% (M = 15%). After the VSM + SLP intervention and fading procedures were removed, Christian's independent completion of steps for the *packing up lunch* transitional routine across five generalization sessions increased slightly, ranging from 18%–80% (M = 48.6%). Because generalization data were not collected across all three transitional routines. A functional relation could not be determined between the VSM + SLP intervention and generalization to other settings; however, results indicated inconsistent improvement can be seen in generalized settings.

Results for Question 5: To what extent do the general education teacher, paraprofessional, and student rate the use of VSM + SLP as acceptable for facilitating independent transition in an inclusive setting for an elementary student with ESN?

Following the completion of the intervention, the general education classroom teacher and paraprofessional who implemented the intervention completed social validity questionnaires. Table 5 shows the results of the general education teacher social validity questionnaires. Overall, classroom staff agreed that the participant enjoyed the intervention and made progress in making independent transitions.

General Education Teacher Social Validity

The general education teacher rated the participant's enjoyment as "neutral" and all other questions about the outcomes of intervention and future use "agree." She also noted in her open-ended response that her request for changing the intervention was to "limit the amount of interventions per day." Her response may have stemmed from the stress of her class moving classrooms at the beginning of the study and the added adults in the classroom for data collection. This was her first year with a student with ESN in her classroom and she also had another student with a disability enroll shortly before the school year started who brought in his own paraprofessional; therefore, adding another adult in the room.

Paraprofessional Social Validity

The paraprofessional rated the participant's enjoyment as "agree" and all other questions about the outcomes of intervention and future use as "strongly agree." She also noted in her open-ended response that she thought, "the only challenge was the

location/environment changing during the intervention. It would be beneficial to have a routine time and place to achieve even better results." The paraprofessional had higher Likert-type scale ratings than the general education teacher, most likely because she was the one implementing the intervention and saw the benefits more directly than the general education teacher who did not have as much time working directly with the student with ESN, as she was in charge of directing the whole class during the study and not as involved with the participant's response to the intervention.

Table 5:

Results from teacher and paraprofessional social validity questionnaire

	General Education Teacher	Paraprofessional
The participant enjoyed the intervention.	3	4
The intervention improved the participants' transitioning skills between task/activities in the classroom/school building.	4	5
The intervention improved the participants' ability to transition more independently.	4	5
The intervention decreased the amount of time needed to prompt the student through a transition and decreased overall time to complete the full transition.	4	5
I would use this intervention in the future.	4	5
Open Ended Question: Were there any challenges or difficulties associated with the intervention? If so, how would you change the intervention?	If possible, limit the amount of interventions per day.	The only challenge was the location/environment changing during the intervention. It would be beneficial to have a routine time and place to achieve even better results.

Note. The teacher and paraprofessional questionnaires consisted of five questions based on a 5-point Likert scale which ranged from 1 (strongly disagree) to 5 (strongly agree)

Student Social Validity

Following the completion of the intervention, Christian completed a social validity questionnaire. The paraprofessional read aloud the questions and answer choices

to him and the lead researcher provided a visual response form with thumbs up for 'yes' and thumbs down for 'no.' He agreed that he improved performance as noted on his social validity questionnaire. He marked that he liked using the iPad® and felt the VSMs helped him understand how to complete the steps in each of the transitional routines. The questions were worded simply and worlds such as 'transitions' and 'independent' were described with examples when asking him if the intervention helped him make transitions (e.g., "did you like getting your mathematics materials on your own' or "did you like using the iPad® to put away your morning work").

Table 6:

Results from student social validity questionnaire

Question	Student Participant Response Paraprofessional Reponses
Did you like using the iPad®?	Y
Did you like watching videos of how to do things?	Y
Did you like watching videos of yourself making transitions?	Y
Did you feel more independent making transitions?	Y
Did you feel like transitions in other classes became easier to do?	Y

Note. The participant questionnaire consisted of five questions, read aloud, with "yes" or "no" answers represented by a "thumbs up" icon or a "thumbs down" icon.

CHAPTER 5: DISCUSSION

The purpose of this study was to investigate the effects a paraprofessional-implemented VSM and a SLP on completion of transitional routines for a student with ESN in inclusive settings. Specifically, the purpose was to investigate the effects of a paraprofessional-implemented VSM via an iPad® paired with the use of a SLP to increase independent transitions between activities for one elementary student with a disability. Effects on the participant's ability to independently complete transitional routines were measured by the percentage of steps completed independently for each transitional routine. Generalized effects were measured for similar transitional routines in different locations (e.g., lunch in the classroom vs. in the cafeteria). The amount of time it took the participant to complete transitions was measured using duration recording. Additionally, the procedural fidelity of the paraprofessional's implementation of the intervention following BST was measured using an item-by-item analysis of procedural steps. The general education teacher, paraprofessional, and student participant completed social validity surveys on their perception of the intervention and its effect on student's transitioning skills across transitional routines. In this chapter, outcomes from the study are discussed according to each research question and themes that emerged from the outcomes of the intervention will be addressed. Lastly, limitations, suggestions for future research, and implications for practice will be discussed.

Independent Completion of Transitional Routines in Inclusive Settings

Visual analysis confirms there is a functional relation between VSM + SLP on independent transitional routines. This study was conducted at the beginning of the school year in a new grade with a new teacher and the school had just moved to a new

campus that was not completely built by the start of school. This study began in a small church office while the second-grade classroom was being built. During the intervention phase for the *morning work to leisure* transitional routine the second-grade class moved into a new classroom and the VSM were re-filmed for accuracy and adherence to the participant's new environment. The *phonics to mathematics* and *packing up for lunch* transitional routines were still in baseline at the time of the class move from the church building to a separate modular unit. Initially the lead researcher tried the VSMs from the church office classroom but there was an immediate drop in accuracy on the trial runs with the older videos. The lead researcher decided it was important for the student to see himself completing the transitional routines in the new classroom so he could see the places where items went during transitions because they were slightly different in his new setting. These videos were still filmed in the original manner planned for the first VSM where steps were filmed out of order and put together on computer software into one streamlined video. The new VSM were shown for the *morning routine to leisure* transitional routine and *phonics to mathematics* transitional routine but not for *packing up for lunch* transitional routine because that routine was not in the intervention phase at the time of the classroom being built. Changes were not seen for any transitional routines in response to using the new VSMs in comparison to the performance seen using the original VSMs; thus, the re-filming process did not influence student performance as a confounding variable.

The student had baseline responding between zero and 50 percent, indicating there were some steps of the transitional routines that he was familiar with possibly from previous school years. There was also some variability in his response to the intervention

and even in baseline which is reflective of the typical variability in his behavioral performance each day as reported by the general education teacher and paraprofessional. They describe this as "on days and off days." Despite the variability, each transitional routine showed higher level, stable trends in response to the VSM + SLP intervention prior to moving to fading and maintenance procedures. The results support similar findings that used VSM + SLP as a combined intervention to increase independent completion of transitional routines (Chiak et al., 2010: Reyes et al., 2020). This study extends the work of Chiak and colleagues by using an iPad® instead of an iPod® and by focusing on transitions within the general education classroom instead of between locations in the school building. This study used a multiple-probe baseline design to determine a functional relation rather than an ABAB withdrawal design as a way to rule out possible carry over effects from the student seeing the VSMs or the SLP. This study was an extension of the work of Reyes and colleagues as the first application of a paraprofessional implementing the VSM + SLP intervention. The participant in this study quickly became more independent with completing steps in transitional routines when a paraprofessional delivered the intervention and he was able maintain high levels of independence during fading and after removing the intervention.

During intervention, the participant watched the VSM prior to attempting each transitional routine as an antecedent intervention support so the participant could see himself perform each step accurately and in order according to the task analysis. For most of the transitions during intervention he would intently watch the videos himself when the paraprofessional directed him to watch the video on the iPad®; however, there were several sessions where the paraprofessional had to redirect him to look at the iPad® or

she would play the entire video again if he did not focus his attention towards it. For these occasions, in order to keep his attention focused on the VSM, the paraprofessional would narrate each step the student participant was doing in the VSM and praising his video performance by saying things such as, “Nice job putting your morning work folder away!” The participant was noticeably more engaged when the paraprofessional provided this narration alongside the VSM.

Following the VSM, the SLP part of the intervention was a consequence intervention because it was an intervention that responded to the participant’s performance of each step. The SLP was delivered according to procedures outlined by Doyle et al. (1988) and Wolery et al. (1986). The specific prompting hierarchy used in this study was applied individual to each step in the transitional routines in the following order: (a) gestural prompt pointing to the next step location or materials, (b) verbal prompt saying the next step, (c) video model showing only one specific step; and (d) partial physical hand-over-hand to complete the step. If the participant did not complete the step after all prompts in the hierarchy were used, then the step was completed for the student by the paraprofessional. Throughout the intervention phase, higher levels of prompts were used infrequently and almost not at all towards the end of the intervention phase for each transitional routine. Each transitional routine required higher levels of prompting in the beginning but then these naturally faded over time because the participant became more independent with individual steps.

The goal of the VSM + SLP intervention was to increase not just accuracy, but also independence in completing steps in transitional routines in inclusive settings. In order to help the student maintain independence, the lead researcher faded the VSM +

SLP intervention and implemented schedule thinning for reinforcement by moving from a continuous schedule of reinforcement (CRF) to an intermittent schedule of reinforcement (INT). During the fading and schedule thinning phases of the study, the VSM was not shown and the paraprofessional did not respond to the student using the SLP. The first transitional routine, *morning work to leisure*, was the only transitional routine that had both schedule thinning procedures and a final maintenance phase where no supports were provided and reinforcement was only delivered upon total task completion. The other two transitional routines, *phonics to mathematics* and *packing up lunch*, had just one set of schedule thinning, CRF, as a maintenance measure but no data for maintenance with reinforcement delivered only upon total task completion were recorded. Following mastery in the intervention phase, all transitional routines were exposed to the first schedule thinning procedure for reinforcement, CRF. The timeline of the research study ran into winter break so not every transition was faded from CRF to INT and a final maintenance phase. During CFR the paraprofessional was directed to provide reinforcement for each step of the task analysis completed independently. If the participant responded incorrectly, she completed the step for him as she did in baseline. The participant maintained high levels of independence during the CRF phase in all transitional routines. For the *morning work to leisure* transitional routine, the second phase of schedule thinning was used by changing reinforcement to INT. During this phase the paraprofessional was directed to reduce the schedule of reinforcement to a variable ratio two schedule by providing praise in response to about every other correct response. Similar to the CRF phase, in the INT phase the paraprofessional responded to incorrect responses by completing the step for the student. Results from the INT phase

also reflected high levels of independent completion of transitional routines. Finally, in the final maintenance phase for the *morning work to leisure* routine the paraprofessional simply gave the instructional cue and did not provide any reinforcement throughout the transition. At the end of the transition the paraprofessional praised the student. The student's response during the maintenance phase showed a slight drop in the percentage of independently completed steps in the *morning work to leisure* transitional routine but the level showed the participant maintained a high level of independence.

Time Spent Completing Transitional Routines

Duration of each transition decreased after the introduction of the VSM + SLP intervention in comparison with baseline. Prior to the start of baseline, duration for each of the targeted transitional routines was practically infinite because the student did not attempt many of the steps in the transitional routines. The student participant never completed any of the transitions independently prior to the start of the study and he would often not start the first step so duration could not be calculated as a true baseline measure. The lead researcher calculated duration by measuring the amount of time from the beginning of the transition when the general education teacher or paraprofessional gave the task direction that it was time to move to the next activity until the end of the transition when the last step was complete. Hume et al. (2014) suggested that transition supports could help students with ASD reduce the amount of time it takes to transition, increase appropriate behavior during transitions, result in less reliance on adult prompting, and encourage successful participation in school. There are no previous studies that calculated duration for transitions when using an intervention to increase independent transitioning during school routines. This study was the first to measure

duration of transitional routines in an inclusive setting for a student with ESN.

In both baseline and intervention phases the student was given multiple opportunities to independently perform each step. The added wait time in between waiting for the participant to attempt a step added to the overall time in both baseline and intervention phases. In baseline, the paraprofessional completed the step for the student if he did not attempt a step within the time limit of five to 10 seconds. Then the paraprofessional waited another five to 10 seconds to see if the student participant would attempt the next step. The wait time in baseline conditions paired with the student's lower levels of response for completing steps of the transitional routines independently showed longer duration overall for each transitional routine in baseline. During the intervention phase similar wait times were used between the steps for the SLP portion of the intervention. If the student did not perform a step independently, then the paraprofessional delivered prompts included hierarchy of prompts accordingly (i.e., gestural, verbal, video model of specific step, partial physical) with a wait interval of five to ten seconds in between waiting for the student to attempt the next step or delivering the net level of prompt needed until the student completed the step. The addition of the wait time in intervention before delivering the next prompt or waiting for the student to complete the next step added to the total time it took the participant to complete the transitional routine. Duration was impacted more in the intervention phase than in baseline because when the student was not completing steps in baseline the paraprofessional was mostly completing them for him (after the allotted five to ten second wait time in between steps); thus, the baseline duration was shorter because the student did not have to complete all the steps. In intervention, these wait times were

extensive because the intervention procedures required the paraprofessional not only to wait in between steps for the student to attempt the next step, but also to wait after delivering one of the prompts from the SLP before delivering the next prompt. Once the student became more independent with the completion of individual steps in the transitional routine, these wait times in between were shortened and in turn the total duration also decreased throughout the intervention phase. Administering instructional probes, in which data would not be completed, every few intervention days may have helped resolve the difference in duration between the baseline and intervention phases. This would allow for comparison against baseline where procedures would be similar.

The duration for the completion of transitional routines was also affected by the chaining of certain steps in each task analysis and overlapping steps. For example, in two of the transitional routines, *morning work to leisure* and *phonics to mathematics*, there were a few sets of steps in the transitions that were the same and were chained together. Both of these transitions involved the student putting away a paper in a folder by (a) opening the folder, (b) putting the paper in the folder, (c) closing the folder, and (d) putting the folder in a designated bin. Although this was not the only example of these mini-chained tasks within a total transitional routine, it was apparent the participant linked these mini-chained tasks together frequently and did them in such rapid succession that sometimes the paraprofessional struggled to deliver reinforcement in between because the participant moved so quickly through these. All of the transitional routines were essentially chained tasks in and of themselves; however, the student's acquisition and generalization of these skills, specifically if they were in more than one transitional routine measured in this study, impacted the participant's overall performance when

completing transitional routines by lessening the time it took the student to finish a transition. Lee (2006) conducted a study that mirrored these effects highlighting behavioral momentum (Nevin, 1984; Nevin et al., 1983) and chaining of tasks, which resulted in higher levels of completion. Lee's study involved using high-probability request sequences, which were not part of this study, but the idea behind his hypothesis is that the participants in his study would be more likely to keep performing the steps in a chained task once behavioral momentum was in place. In this study, it is possible that behavioral momentum contributed to his successful transitions because once he started certain mini-chained tasks within the total behavioral chain required to complete a full transition, he kept going at a more rapid pace; thus, decreasing the duration of his completion for the total transition.

Another component affecting duration of completion of transitional routines in this study was the amount of time it took the student to compete each step. The lead researcher set time limits based on the expected amount of time each step should take to complete for each step in each transitional routine. For the student's response to be counted as completed independently, it also had to be completed within the expected time limit. During the study, the student was completing steps to transitional routines that no one had previously seen him attempt, so some of the skills were relatively new expectations for him since he did not have anyone completing steps for him. For example, he was expected to push in his chair as a step for the *phonics to mathematics* transitional routine and, in doing so, on the new classroom carpet, it took him longer than the expected five seconds. The participant worked diligently by crouching down low to grab the chair legs lower in order to get his chair pushed in and would crouch down low

and grab the chair by the bottom back legs in an effort to get the chair all the way pushed in. In many instances, this step took much longer than the allotted five seconds so even if the rest of the transitional routine was completed independently in the set time limits for each of the other steps, the total duration of the transition was longer because the "pushing in the chair" step took so long.

Effective Training Models for Paraprofessionals

The paraprofessional received training on how to implement the VSM + SLP prior to the start of the intervention with the participant using BST (Parsons et al., 2012, 2013). Procedural fidelity for training was high, above an average of 80%, and the impact was seen in the participant's performance for making independent transitions. In fact, the paraprofessional's procedural fidelity for this study only fell below 80% in seven out of 108 sessions (6.5%) of the entire study, including baseline, intervention, fading, maintenance, and generalization procedures. There is an implied connection between the two: effective training provided with fidelity and implementation of intervention with fidelity.

Key features of BST used in this study included (a) written and verbal directions, (b) modeling, (c) practice with live coaching, and (d) delayed feedback. The written directions provided to the paraprofessional were written with less technical language and simplified into bullets and tables (see Appendix J). The lead researcher spent two days reviewing the direction for each phase individual prior to the baseline and intervention phases. During this training, the lead researcher encouraged the paraprofessional to ask questions for clarification and verbally role-played some of the possible scenarios with examples of student responses and the appropriate paraprofessional response required.

Next, the lead researcher modeled the feedback methods with a general education student who was told to do some of the steps in the transitional routine wrong so the lead researcher could show the baseline procedure of completing the step for the student and the intervention procedures of SLP. The lead researcher specifically modeled how to keep a distance and look away during wait times when waiting for the student to complete the next step or when waiting for the student to respond to a prompt from the SLP hierarchy. The lead researcher and paraprofessional maintained an open dialogue throughout the BST so when it came time for live coaching rapport was built between the two individuals. Live coaching was mostly done through gestural motions as to not to affect the participant during data collection and to make sure the participant would not be affected by the Hawthorne Effect by having an awareness that he was being watched. In the beginning of the study, the lead researcher met briefly with the paraprofessional in the classroom or outside the classroom to provide feedback on that specific transitional routine and the procedures, baseline or intervention procedures, used by the paraprofessional. The two discussed what went well and what needed to be improved. Occasionally, the lead researcher showed a quick playback of the session that day from the GoPro camera that was used for secondary data collection so the paraprofessional could see herself in action. The lead researcher provided these videos for two purposes. First, they were useful to boost the paraprofessional's confidence by pointing out things she did well and giving her specific praise. Secondly, they were effective at showing the paraprofessional parts of her responses that could have been done differently. In this way, the lead researcher was able to give error correction to the paraprofessional and direct her to her training materials and give ideas for how to remember the step she completed

incorrectly. Since paraprofessional procedural fidelity rarely fell below the mastery criteria of 80%, there were few sessions of retraining needed and the paraprofessional often noticed her own errors even before the lead researcher provided feedback.

Implementation of Evidence-based Practices by Paraprofessionals

When students with ESN are able to access the general education setting, they are often accompanied by paraprofessionals rather than special education teachers due to staffing needs (Giangreco et al., 1997). VSM + SLP are two interventions established as EBPs (Browder et al., 2014; Wong et al., 2015), but literature is limited on SLP implemented by paraprofessionals and there is no current literature showing paraprofessional-implemented VSM. Brock and Carter (2013) conducted a literature review and found evidence that paraprofessionals had implemented a wide variety of instructional practices resulting in positive outcomes for students; however, these practices were not all EBPs and implementation fidelity was not conducted on all of the studies included in the literature review. This study expands the research needed for paraprofessional training because the paraprofessional was able to effectively implement the VSM + SLP intervention with procedural fidelity above 80%.

The paraprofessional in this study had some prior exposure to VSM + SLP through conversations with the lead researcher from the previous school year but no live experience seeing it implemented nor had she implemented either in isolation or together. The paraprofessional was in school to add to her degree for serving children with developmental delays and other diagnoses in early childhood education. She had a rough idea of what EBPs were prior to the study but could only tell the researcher that she knew they were the ones teachers were supposed to be using, but she did not know where to

find them and did not have awareness of what implementation fidelity was prior to the study. Even though her background in EBPs was limited, she was very willing to learn and had high expectations for herself. She was attentive to the directions on how to implement each of the EBPs in this study and asked questions to clarify not only her performance but also her understanding of each practice. For example, she asked questions such as, "If I go to give a gestural prompt and the student is starting to complete the step, do I stop or still give the gestural prompt?" The lead researcher did her best to answer each question and conferred with her advisory and fellow research team members whenever complex questions came up.

Generalization of Transitioning Skills

The student learned to make transitions independently in classroom transitional routines. To determine if he was able to generalize transitioning skills in other settings, he was observed in a different location of the school for one of the transitional routines (e.g., lunch in the classroom vs. in the cafeteria.). Data were variable for generalization in the cafeteria setting for the *packing up for lunch* transitional routine and moderate levels when compared with results following the intervention in the classroom setting. The first two generalization data points were collected in the lobby of the church while the classroom and cafeteria were being built. The lobby was similar to the cafeteria setting used as the generalization setting at the end of the study following the end of the intervention phase because both had table groups with chairs. The generalization settings were also similar because they were in a common area with more movement and noise than when the second grade ate lunch in the classroom at individual desks with chairs. There was one day where his generalization data were much lower than the rest of the

generalization data points, but this was explained by data across the three transitional routines that were all lower for that day. The data indicate there may have been an outside factor negatively impacting all the data for that day because generalization was higher for the next two sessions. More data are needed to determine a functional relation between the effects of the VSM + SLP intervention on generalization of independent transitioning in inclusive settings.

Perceptions of Intervention and Outcomes

The results of the general education teacher and paraprofessional survey had similar positive answers. The general education teacher rated items as mostly as positive for the Likert-style scale portion of the survey; however, her response to the open-ended question raise important questions about the role of the general education teacher in supporting students with ESN in inclusive classrooms. Her chief complaint about the intervention was that she wished it didn't have to be implemented so many times throughout the school day. From a researcher perspective, the replication and verification of the effectiveness of the intervention is necessary to determine a functional relation in single-case design research. The lead researcher believes the general education teacher was somewhat overwhelmed by the intrusiveness of the data collection because it involved additional adults in the classroom with a video recording device (for secondary data collection purposes) daily as well as additional adult chatter prior to and following a data collection session. This also was the first year this general education teacher had a student with ESN in her classroom and she had verbally expressed apprehension about having him in her class even since last school year when he was in the grade below hers. She also acquired an additional student with ESN in the first week of school that she was

not expecting and there was a delay on permanent staffing of a paraprofessional for the other student. Combining these factors with the stress of a school move, it is easy to say the general education teacher had a lot weighing on her during the course of this study from these outside factors.

The paraprofessional's perception when implementing intervention is especially important and impactful on the results of this study. She rated the acceptability and feasibility of the study high and added feedback in her open-ended answer that she wished there were more opportunities to establish routines in the actual classroom setting before beginning the intervention instead of having to move classrooms during the study. Of course, this is not a change that could be made due to the restrictions of the school's building timeline, but the paraprofessional was consistent throughout both settings and the student made the transition relatively smoothly between the locations as well. The paraprofessional in this study also was seen in the intervention videos with a smile on her face because the student was completing many steps on his own consistently. Although this reaction was not captured in the quantitative data or in the social validity questionnaire, anecdotal accounts such as this and conversations with her showed that she was invested in this student and was happy to see him complete transitions more independently with less reliance on her. In an off-hand conversion with the lead researcher, she expressed verbally that she felt relief when she could get a break from having to do everything for him and hoped that his mom maintained high expectations for him in transitional routines at home too.

Overall, the perception of the independent transitioning questionnaires indicated the student had a positive response to the intervention. He answered "yes" to each of the

questions on the post-intervention survey. The final result should be interpreted with the pre-intervention in mind. It also is important to note that the student might not have understood what was being asked or may have simply wanted to be compliant or pleasing to the person asking. Numerous studies only use post-surveys and therefore may only get this final result. In session observations, the student showed pride in his ability to complete steps of the targeted transitional routines and even provided self-reinforcement of hand clapping and telling himself "good job" or "you did it" with a smile on his face when he completed a step independently regardless of whether he was in the intervention, fading, or maintenance phases.

Outcome Themes

Independence of Students with ESN in Inclusive Settings

Previous research suggests students with ESN were less likely to be in inclusive settings due to lack of independent skills (Kleinert et al., 2015; Morningstar et al., 2017). Specifically, students who experience difficulty with transitions often require additional adult support (Kleinert et al., 2015). In many cases, this leads to reduced access to inclusive settings, which can result in a feeling of isolation (Giangreco et al., 2005). Students with ESN are particularly at risk for this because they require an extensive level of support across academic and daily living domains. The term ESN is relatively new in the field of special education research and is synonymous with other terms such as "intensive support needs" or "complex support needs." No matter which term is used, the definition is the same. These individuals are being identified less by ability level or IQ and more so by the needs they exhibit (Kurth et al., 2018b).

One way to measure the extent of support needs is through the *SIS-C*, a norm-referenced assessment tool that assesses students based on their needs in the areas of home life activities, community and neighborhood activities, school participation and learning activities, health and safety activities, and advocacy activities (Thompson et al., 2016). The *SIS-C* requires people who know the student well to rate the student's level of independence on different items in each domain area and has interviewees note the frequency and intensity of the amount of support needed to do each of the items across the domain areas. Following legislation and advocacy movements to help students with ESN greater access to the general education setting, levels of independence may play an important role to their access. This study showed that a student with ESN could become more independent in an inclusive setting through the combined EBPs of VSM + SLP. Additionally, students with ESN who are able to access the general education setting often do so with a paraprofessional instead of a special education teacher (Giangreco et al., 2010; Ryndak et al., 2013). This study showed that a paraprofessional was able to provide the needed levels of support and fade them over time until the student became more independent in completing transitional routines in the inclusion setting. Implications also exist for students with ESN who independent complete transitions because if they spend less time on transitions it could allow for more instructional time.

Importance of Paraprofessional Training and Support using Evidence-based Practices

Paraprofessionals play a major role in supporting students with ESN; however, their role can be strengthened through proper training and implementation of EBPs (Brock & Carter, 2013; Kurth et al., 2019; Walker & Smith, 2015). Paraprofessionals are often the least trained in using EBPs but spend significant amounts of time supporting

students with ESN (Brock & Carter, 2015), especially if they are participating in the general education setting. Although a previous study by Reyes et al. (2020) showed a functional relation between using VSM + SLP as an intervention to increase independent completion of transitional routines, a limitation was that the intervention was conducted by the researcher. As researchers are rarely present in applied settings like schools, it is important to teach the personnel in those settings to implement the intervention. Additionally, most paraprofessional training studies have the researcher train the paraprofessional but in reality, it is not feasible. The training role would typically fall on the special education teacher but general education teachers could be useful in training paraprofessionals as well. In an inclusive, general education classroom, one potential interventionist is the paraprofessional. In this study, a paraprofessional was trained to deliver the VSM + SLP intervention by the lead researcher. Training included an initial information session on prompting hierarchies, the importance of increasing student independence, components of a task analysis, and the steps in error correction. The lead researcher also modeled the procedure for the paraprofessional and they rehearsed together. Feedback was provided during the BST and throughout the study. Procedural fidelity was collected for the paraprofessional training according to the steps outlined in BST (Parsons et al., 2012) and separately for the actual implementation of the VSM + SLP intervention by the paraprofessional during intervention. Results showed the training was effective in teaching the paraprofessional how to implement with fidelity which translated into positive effects for the participant in acquiring independent transitioning skills.

Multicomponent interventions

Multiple EBPs have been combined for use with students with ESN including interventions combining VSM + SLP. This study utilized two EBPs including VSM + SLP with a student with ESN in an inclusive setting. VSM was used by videotaping the student completing each component of the task, and then showing him a complete chained video prior to initiating the task. SLP was the prompting hierarchy used in which the student was given the opportunity to complete the task independently before the paraprofessional provided increasingly more intrusive prompts (i.e., gestural, verbal, model, partial physical). In this study the student was taught to complete the steps of a chained task for completing a transitional school routine independently by first watching a VSM of himself completing the transitional routine and then being supported by the paraprofessional's use of a SLP. VSM + SLP in combination become even more effective when combined, as evidenced by Chiak et al. (2010), who found a functional relation between VSM combined with a SLP and number of independent transitions students with ASD made between locations in a school. Also, results from another study by Reyes et al. (2020) replicated these effects with transitions within the inclusive classroom setting for typical school routines (e.g., unpacking in the morning, leisure activity to reading groups, lining up for lunch). This study extends these results by showing VSM + SLP as an effective multi-component intervention package for students with ESN to make independent transitions, specifically as a paraprofessional-delivered intervention.

Technology-Aided Instruction

Prior data-based studies have shown the use of technology to teach students with disabilities is supported by literature (Alper & Raharinirina, 2006; Ayers et al., 2013;

Okolo & Diedrich, 2014). Specifically, the use of video modeling and video prompting have been used to teach a variety of skills, such as social, daily living, and academic skills (Norman et al., 2001; Park et al., 2018). The participant in this study was taught to view a VSM on an iPad® prior to beginning each transitional routine. From prior observation, the lead researcher knew the student participant could complete each step of the task analysis in isolation, in essence he had the prerequisite motor skills. The lead researcher and paraprofessional worked together to verbally prompt and model prompt for the student to complete each step so the lead researcher could get short clips of steps in isolation. The lead researcher edited the videos together to use for the VSMs for each transitional routine. The technology used in this study were an iPad and a laptop, both items readily accessible in many classrooms today. This study builds the research base on the use of technology-aided interventions for improving outcomes for students with ESN, specifically for completing steps in a chained task using VSMs.

Generalization

Generalization is evidenced when a previously learned behavior occurs in different stimulus conditions in which it was not directly taught (Cooper et al., 2020). This study measured generalization of completing transitional routines in different location of the school for one of the transitional routines (e.g., lunch in the classroom vs. in the cafeteria.). In terms of generalization, transitioning is a complex process. The skills targeted in this intervention are a general sample of a vast number of transitional routines that are expected in inclusive settings. For example, completing morning work and then choosing a leisure activity in this study will become more complex in school years where the student is expected to do several different morning routine activities prior to getting to

"morning work" or the first assignment of the day. Teachers year to year will have different expectations of morning routines; thus, students must be able to adapt and generalize skills learned from previous settings and teachers in new settings with new teachers. This study had limited evidence that the student truly generalized the independent completion skills needed for the *packing up for lunch* transitional routine partially due to the discrepancies in the two locations. The cafeteria is a different inclusive environment compared to the general education classroom. There are multiple classes in the cafeteria at the same time with different behavioral expectations for noise volume and movement than in the general education classroom setting. Student with ESN may have a harder time generalizing to these other settings without some faded supports to transfer the skills from one setting to another larger inclusive setting.

Specific Contributions of the Study

Due to the limited research on interventions to support independent transitions within inclusive classrooms settings for students with ESN, this study contributes to the literature base through the combination of the use of VSM + SLP as an intervention. In isolation, each of these practices are already established as EBPs (Browder et al., 2014; Wong et al., 2015); however, the use of VSM + SLP together is not yet an established EBP. This study contributes to the literature base supporting the use of these two practices together. This study also measured if the student could complete steps for transitional school routines independently as in previous studies (Chiak et al., 2010; Reyes et al. 2020). Results indicated the intervention was effective to teach a student with ESN to transition independently in an inclusive setting. Next, this study is the first study to measure the duration of transitional routines in response to a VSM + SLP intervention.

Results showed the student decreased the amount of time needed to complete transitions independently after the intervention was introduced. This study also measured the effects of BST on the procedural fidelity of the paraprofessional who implemented the intervention. The BST procedures were found to be effective for teaching the paraprofessional how to implement the intervention and maintain fidelity throughout the study. Brock and Carter (2013) indicated more research was needed on paraprofessional-delivered interventions for EBPs. Since this study incorporated two EBPs with training and support for a paraprofessional to deliver the packaged intervention, it adds to the literature base for paraprofessional-delivered evidence-based practice interventions. Additionally, this study measured the extent to which the student generalized transitional skills to other settings. Findings suggested that generalization is possible, but the percentage of steps completed independently dropped in generalization. Lastly, this study measured if the general education teacher, paraprofessional, and student participant deemed this intervention as feasible and acceptable for future use. Results from social validity measures showed the general education teacher and paraprofessional mostly agreed the intervention was socially valid, but the paraprofessional responded more favorably than the general education teacher across each measure. The student rated the intervention as acceptable and helpful for facilitating independent transitions in an inclusive setting. Many components of ABA were used in this study through antecedent and consequent events of VSM + SLP respectively. The results from this study reflect changes in a socially significant behavior because making transitions in inclusive settings is an important independent skill needed by students with ESN access the general education setting.

Limitations

This study had several limitations. First, the sample size included only one participant. The participant also had previous exposure to VSM + SLP from a similar intervention for completing different transitional routines in the school year before the study where the lead researcher implemented the intervention. This previous exposure influenced the participant's learning history and may not be characteristic of all students in this population.

Second, there were several limitations related to the school site and personnel. The classroom was not built in time for the study to start so the lead researcher had to begin the study while the classroom was still being held in a small church office. The setting did not look like a classroom and was more relaxed than a typical classroom environment where students sit in rows with individual desks and chairs. This may have impacted the study as effects may have been seen earlier if the setting was more consistent. This study was implemented in a general education classroom with a veteran teacher who was new to experiencing inclusion, specifically inclusion of students with ESN. This may have impacted the results of the study because the paraprofessional was typically the person delivering the task direction to initiate transitions. The student did not respond to the general education teacher's directions for starting transitions. It would have been preferred to have him follow the general education teacher's direction and then have the paraprofessional provide a supportive role to move the student towards independent transitioning in his inclusive classroom. Additionally, the paraprofessional who implemented the intervention had worked with the student as a one-on-one

paraprofessional for a year prior to the start of this study. Combined, these factors may not by typical of other inclusive environments for students with ESN.

Lastly, the effects of the BST could not be measured experimentally given that the primary dependent measure was student performance. Although this study measured the procedural fidelity of the paraprofessional's implementation of the VSM + SLP intervention, there are only implied connections between the BST and the paraprofessional's performance. It is possible the paraprofessional was motivated by being in a research study or simply interested in learning a new EBPs and this impacted her performance. With other confounding variables related to her training not controlled for, the effects of BST could not be measured in this study as it was designed.

Suggestions for Future Research

The results of this study lead to several recommendations for future research, including expanding and varying the target population, conducting a VSM + SLP component analysis, examining paraprofessional training models further, and developing fading procedures and generalization supports. First, future research should investigate if a VSM + SLP intervention is effective with a larger number of students with ESN or with students with other disabilities in inclusive settings. Additionally, more research is needed for VSM + SLP in academic or social skill areas. Future research should investigate ways to modify VSM + SLP across different skills within inclusive classrooms. Future research could extend the applicability in inclusive settings by utilizing peers as interventionists to show the VSM and provide a SLP or another prompting procedure.

A second recommendation for future research would be a component analysis to see if one EBP impacted the results more significantly than the other. This analysis could have VSM be used in isolation or SLP in isolation prior to combining the two EBPs. Another way to examine the effects of each component individually would be to have one component removed before the other after the VSM + SLP intervention was implemented together. Researchers should use caution when examining these two components because there may be carry over effects that are not resolved simply with the removal of one component. Having more participants will solidify the research needed for a component analysis because results can be replicated across participants with different parts of the VSM + SLP intervention introduced in a different order. Studies could also examine if other response prompting procedures, such as constant time delay or simultaneous prompting could produce similar or more impactful results.

In addition to previously mentioned suggestions for future research, a third recommendation for future research is needed to investigate paraprofessional training models used to teach evidence-based practice implementation. Previous research involving training of paraprofessionals to deliver EBPs interventions shows that with effective training, paraprofessionals are capable of using EBPs for students with intellectual disabilities (Brock & Carter, 2013). Future research is needed to determine the best format for training and supporting paraprofessionals, specifically for students with ESN in inclusive classroom settings (Morningstar et al., 2007). In this study, the paraprofessional mostly received feedback on her performance verbally following a session, but future research could examine the effects of using video feedback paired with paraprofessional self-assessment on the implementation fidelity of the paraprofessionals

use of the intervention (e.g., in the moment or bug-in-ear coaching). In addition, the paraprofessional fidelity in this study was measured as adherence to implementation by the number of items on the procedural fidelity checklist completed correctly out of the total number of items but a more robust measure would be to evaluate the quality of implementation using a Likert-type scale for the levels of implementation by low and high quality. For example, future research could rate positive praise along a quality continuum of "4- *enthusiastic and genuine*", "3- *sincere but lacking enthusiasm*", "2- *nonchalant and brief*", "1- *nonspecific praise in monotone*", "0- *does not praise*." By measuring multiple dimensions of implementation fidelity, effects on the participant can be maximized by replicating the most effective implementation by quantality and quality.

Fourth, other studies suggest that intervention effects may be limited if fading is not planned as part of the intervention (Brock & Carter, 2013; Chiak et al. 2010; Reyes et al., 2020). This study involved fading the VSM + SLP intervention and thinning the schedule of reinforcement, CRF and INT. Maintenance was collected for one week prior to the end of the study but a better measure of maintenance would be a delayed evaluation of independence with transitioning weeks or even months later. This is a common limitation among paraprofessional intervention research, likely due to research and school timelines (Walker & Smith, 2015). Future research should investigate fading supports and lasting effects of VSM + SLP.

Lastly, in reflection on the anecdotal comments from the general education teacher during this study combined with her responses on the social validity questionnaire, it is apparent more research is needed on the perspective of the general education teachers related to the inclusion of students with ESN. Cameron and Cook

(2013) found that general education teachers did not feel responsible for the education of students with severe disabilities. There may be many factors that influence this reduced accountability which have not been fully explored through research. In a survey of general education teachers by Carter and Hughes (2006), special education teachers, paraprofessionals, and administrators found the substantial barrier reported by general education teachers was "limited time to collaborate with special education teachers" and the greatest risk of inclusion was that "students with disabilities may disrupt class." In another survey of 571 general education teachers, seven factors were identified as significant stressors on teachers in inclusive classrooms: "(1) reduced ability to teach other students as effectively, (2) being held accountable for the child's educational outcomes, (3) the child physically attacks others, e.g., hits, bites, (4) sustaining an active learning environment for the child, (5) difficulty in monitoring other students when attending to the child, (6) [the student with a disability] disturbs others, and (7) [reduced] time available for other students." It is important to note that "the highest levels of stress appeared to come from a teacher's personal commitment to maintaining effective teaching for all children in their classes" (Forlin, 2001). Previous studies have evaluated general education teacher perspectives as to what barriers exist for inclusion but none of the current studies have asked teachers what they need to reduce barriers (Carter & Hughes, 2006; Forlin, 2001). More research is needed to identify these barriers and find effective avenues for professional development on how they can increase interaction with students with ESNs who are included in their classrooms. Research around the role of collaborative relationships is another area to explore. Students with ESN who are in inclusive settings require a team approach involving the general education teacher,

special education teacher, and paraprofessional. In cases where inclusion is happening in a general education classroom with a paraprofessional, the special education teacher is not the direct supervisor, but rather, the general education teacher is the direct supervisor. More research is needed on what the supervisory role looks like and the overall relationship dynamic between the general education teacher and paraprofessional.

Implications for Practice

Results from this study provide several implications for practice. First, since the participant with ESN was successful and independent in making transitions in the general education setting, this shows that a student with Down syndrome could develop more independence when EBPs are applied. Practitioners should consider the transitions in their classroom that a student with ESN could be independent with and develop a VSM + SLP intervention around the one that the student could experience success with the quickest. Based on the results of this study, instructors could use VSM + SLP to teach independent transitioning skills.

Second, the participant in this study significantly reduced his duration of time needed to complete each transition. When less time is spent addressing transitional routines, more time can be spent on academic and social skills instruction. For students with ESN who attend some or all of their day in inclusion settings it is important to maximize instructional time. Due to the complex nature of these students' needs, they have many IEP goals and other related goals to work on in addition to the instruction they receive in the general education classroom. Gaining time for specific skills instruction or time to preview the day's lesson in the general education classroom would be beneficial to the student with ESN.

Third, the results from this study highlight the importance of general education teacher and paraprofessional knowledge and skill in using VSM + SLP for use in inclusive classrooms. Administrators must recognize the amount of collaboration time needed for special education teachers, general education teachers, and paraprofessionals to plan and implement EBPs in inclusive classroom settings. In this study, spending time on the front end of an intervention such as VSM + SLP to plan the implementation and ensure fidelity was key in the success of the intervention to help the student with ESN in become more independent in making transitions. Administration support is needed for scheduling planning time for teachers and paraprofessionals to work during the school day to discuss needs and create plans using EBPs. Often students with ESN who access the general education classroom are accompanied by a paraprofessional rather than the special education teacher because they remain in the self-contained or resource classroom serving other students. Continued planning time also is needed for observation and feedback between the special education teacher or general education teacher and paraprofessional to ensure implementation fidelity is consistent over time. Special education teachers would need to conduct procedural fidelity through scheduled observations to help maintain fidelity over time. In between times where the special education teacher could come in for an observation, paraprofessionals could use a self-reporting system by documenting their own adherence to procedural fidelity steps.

Fourth, the opportunity for generalization from this study provides implications for practice. This study used VSM on an iPad, but as technology advances and newer platforms and software are developed, practitioners must find ways to use these to benefit students with ESN in inclusive settings. Generalization can also be practiced in

classrooms by having paraprofessionals apply EBPs, such as VSM + SLP, across different students across contexts. This study has implications for parents and community members in presuming competence and having high expectations for all students with ESN. As a result of this study, the participant showed his was able to complete transitions more independently following the VSM + SLP intervention, so parents should take notice and expect similar displays of independence in home and community environments following proper supports and interventions such as these.

Lastly, there are implications for practice in inclusive environments where general educator teachers are be responsible for overseeing paraprofessionals. Special education teachers may not be present to respond to negative attitudes from the general education teacher. Paraprofessionals will need to navigate team social dynamics through those situations. Also, general education teachers will need training to communicate their supervisory role with paraprofessionals and to ensure they are training and supervising paraprofessionals correctly. In this study the lead researcher trained the paraprofessional, but in applied settings, the general education teacher or special education teacher would need to provide this support. Overall, special education teachers should focus on involving general education teachers in educating students with ESN.

Summary

This study evaluated the effects of a paraprofessional-implemented VSM + SLP intervention on the independent completion of transitional routines for a student with ESN in an inclusive setting. The student was successfully taught how to independently complete transitional routines in response to the VSM + SLP intervention. VSM was used to show the student recorded videos of himself completing the transitional routines

from start to finish prior to attempting to complete each transitional routine. A SLP was provided by a paraprofessional using a hierarchy of the least intrusive prompt to the most intrusive (i.e., gestural, verbal, model, partial physical) until the student responded correctly for each step. A functional relation was found between the VSM + SLP intervention and independent completion of transitional routines. The student decreased the amount of time needed to complete each transitional routine in in response to the intervention. The paraprofessional was able to maintain procedural fidelity above 80% for the duration of the study. The participant showed some generalization for one of the transitional routines when packing up for lunch in the classroom *vs*. in the cafeteria. The results of this study add to the small body of literature citing the effectiveness of VSM + SLP for teaching transitional routines (Chiak et al., 2010; Reyes et al., 2020). The findings of this study could have strong implications for designing and implementing multi-component EBP interventions for students with ESN in inclusive settings to improve independence skills and decrease reliance on paraprofessional support.

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APPENDIX A: PRINCIPAL LETTER OF SUPPORT

School/School system logo here

August xx, 2019

Elizabeth N. Reyes,
Candidate
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9201 University City
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NC 28223

Dear xxx,

I am writing this letter in support of your proposal to conduct research with a first grade student with extensive support needs at xxxx in Charlotte, NC, regarding the effects of using a paraprofessional-implemented intervention using video modeling on an iPad and a System of Least Prompts to teach independent completion of transitional routines in inclusive settings. I also commend your efforts to increase opportunities in general education classroom settings for student's disabilities. At our school, we share the vision for all students to learn and place importance on providing instruction that is effective in meeting individual needs. I support the quest to validate questions surrounding increasing independent transitioning for students with extensive support needs in inclusive settings. Identifying practical, research-validated strategies using technology such as the iPad would be beneficial to students and teachers.

I support your efforts to conduct research on making transitions that are effective for our students and staff. I look forward to collaborating with you on this project and feel that you will have the cooperation of our staff members since xxx is a place where all staff members are dedicated to student success.

Sincerely,

Xxx

APPENDIX B: PARENTAL CONSENT FORM

UNC CHARLOTTE

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.2916 www.uncc.edu

Parental Informed Consent for
Effects of Video Modeling on Completion of Transitions in Inclusive Settings

August xx, 2019

Dear Parents/Guardians:

Your child is invited to participate in a research study intended to measure the effects of a paraprofessional-implemented intervention using video modeling and an increasing level of prompts (gestural, verbal, modeling, partial physical) on completion of transitional routines for a student with extensive support needs in inclusive settings. Specifically, the researchers will create a video of your child completing the task so he/she can watch the video of himself/herself completing typical transitions in his/her school day on a iPad2®. An increasing level of prompts will be used one of the classroom paraprofessionals with the video-self models to help a student complete transitions in his inclusive school setting. The participant will then have the opportunity to perform the steps in each transition independently. Ultimately, the purpose of the study is to help a student complete transitional routines independently in an inclusive setting.

The lead investigator on the study is Elizabeth Reyes, a doctoral student in the Department of Special Education at the University of North Carolina at Charlotte (UNCC). The other study team members are Charles Wood, Ph.D., and Virginia Walker, Ph.D.. both professors from the Special Education Program at UNCC; and Ms. Amy Clausen, a doctoral student from UNCC. Mrs. Elizabeth Reyes will train a paraprofessional currently working with the participant to implement the intervention by creating the videos of your child making transitions and showing videos to a student step-by-step, provide prompting through the steps, and record data for each session of the study. Ms. Clausen will also observe and collect data for some of the sessions.

Your child is considered eligible for this study if they qualify for special education services and are served in an inclusive setting; as well as, he/she must currently need extensive support to make transitions throughout his/her school day. Other eligibility criteria data refers to your child's age, eligibility for special education services, and IQ. Your child's name will not be written on any stored data in order to maintain confidentiality.

The study is expected to last up to four months. During this time the student will meet individually with Mrs. Reyes one to four times per week for approximately 30 min (spread across

three sessions/transitions). Mrs. Reyes will collaborate with your child's teacher to choose times to meet that do not interfere with any academic instruction from his or her classroom teacher. For the experimental intervention, Mrs. Reyes will teach your child to make transitions independently in the inclusive classroom setting. The videos of your child used for the intervention will be presented through the iPad2®. Your child's general education teacher will still direct students as a whole class at the beginning of each regular transition as he/she would for all students on any given day. The paraprofessional will show the videos of your child completing the transitions and provide prompting as necessary though each transition. Following this intervention, your child will share his/her opinion of the use of video modeling.

A minimum of one third of the sessions will be videotaped. These full-length videos will be viewed only by other members of this research team, and they will be used to ensure we are implementing the procedures of the study correctly and scoring your child's responses correctly. The full length video recordings will be destroyed after data analysis; however, less than 10 short video clips from before and after the intervention will be kept on a password protected UNCC Google Drive for the purposes of sharing the results from this study at presentations that will be viewed publicly at conferences to show effects of the intervention.

There is a minimal risk of frustration for the student during the first phase of the study. During these sessions, the student will be asked to perform tasks that may be hard for the student, but the student will be provided increasing level of prompts to reduce frustration. Providing support through delivering an increasing level of prompts (gestural, verbal, modeling, partial physical) allows your child the opportunity to complete each step of the transition independently but provides support if he/she does not complete the next step. For example, if your child is supposed to hang his/her book bag on his/her hook and does not complete this step, then the researcher will point to the book bag hook (gestural). If he/she still does not complete the step, then the researcher will say, "hang your book bag on the hook" (verbal). If this does not work, and the student still does not complete this step, then the researcher will model the behavior for the child by hanging the book bag and then taking it back off and asking the student to do it again (modeling). If the student still does not complete this step then the researcher will provide a partial physical prompt (physical) by hand-over-hand guiding the child to hang the book bag on the hook. This level of increasing prompts will be used for each step in the intervention with the goal of the child needed less support as the study progresses.

Benefits to your child include the potential to improve his or ability to make transitions more independently in the inclusive setting. These skills will possibly decrease your child's need for adults to support him/her through transitions. Additionally, we will be using typical classroom transitional routines, so your child will be doing the same thing the other students are doing at the same time as the rest of the class. Benefits may extend to the greater society of others by informing practitioners on strategies to help students with extensive support needs to make more transitions independently.

Participation in this study is completely voluntary. If you and your child decide to allow your child to participate, you may decide to stop participation at any time. You and your child will not be treated differently if you decide at any time not to participate.

We will treat all participants with respect and dignity. If you have any questions about the treatment of your child as a participant in this study, please contact the university's Research Compliance Office (704-687-3309). If you have any questions about the study, please contact

Elizabeth Reyes (Elizabeth.reyes@uncc.edu) or Charles Wood (704-687-8395, clwood@uncc.edu).

I have read the information in this consent form. I have had the chance to ask questions about this study and about my child's participation in the study. My questions have been answered to my satisfaction. I am at least 18 years of age, and I agree to allow my child to participate in this research project. I understand that I will receive a copy of this form after it has been signed by me and the principal investigator of this research study.

_____

Student's Name

_____ DATE _____

Parent's Signature

_____ DATE _____

Researcher's Signature

APPENDIX C: TEACHER AND PARAPROFESSIONAL CONSENT FORM

UNC CHARLOTTE

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.2916 www.uncc.edu

Teacher and Paraprofessional Informed Consent for
Effects of Video Modeling on Completion of Transitions in Inclusive Settings

August xx, 2019

Project Purpose
You are invited to participate in a research study titled "***Effects of Video Modeling on Completion of Transitions in Inclusive Settings".*** The purpose of this study is to help a student with extensive support needs complete transitional routines independently in an inclusive setting. This is a research study that will include video taping a student making transitions as a model to show the student before having the student complete the transitions independently.

Investigators
This study is being conducted by a doctoral student, Elizabeth Reyes from the University of North Carolina at Charlotte (UNCC). The responsible faculty member is Dr. Charles Wood.

Eligibility
You are invited to participate in this study if you are a teacher or paraprofessional in an inclusive classroom setting serving at least one student with extensive support needs.

Overall Description of Participation

If you volunteer to participate in this study, you will be asked to participate in the following:

1. Attend a brief meeting at your school to learn about the details of the research study and ask any questions. This should last about 10 minutes. You will receive a copy of the Teacher/Paraprofessional Consent Form.
2. Allow the lead researcher to come into your classroom on a daily basis during the study. The first sessions would consist of the lead researcher using a UNCC iPad to videotape the target student making transitions. In the next set of sessions the lead researcher will video tape the student making attempts to complete typical classroom transitions on his/her own. During the final phase of sessions, the lead researcher will have the target student use headphones prior to the upcoming transition to watch a video of himself/herself making the transitions previously videotaped on the iPad; and deliver an increasing level of prompts as needed for the student to complete the transition without the assistance of the general education classroom teacher or the paraprofessional. Your

role during this time would be to not provide additional prompting outside of the planned videos and prompts delivered by the lead researcher.

3. Attend a follow-up meeting so the researchers can share the results of the study with you and ask a few follow-up questions your perception of the feasibility and outcomes of the study. This should last about 10 minutes.

Length of Participation
Your participation will take approximately 30 minutes for the beginning and ending meetings, approximately 30 classroom observations and intervention sessions of up to 30 minutes each over 4 months. We anticipate starting this research study in December 2018 and completing data collection by March 2019. The follow-up meeting will take place after the data has been analyzed.

Risks and Benefits of Participation
There is no risk associated with this study, outside of the time required for you to participate in the study. There may be risks which are currently unforeseeable.

Volunteer Statement
You are a volunteer. The decision to participate in this study is completely up to you. If you decide to be in the study, you may stop at any time. You will not be treated any differently if you decide not to participate in the study or if you stop once you have started.

Confidentiality Statement
Any identifiable information collected as part of this study will remain confidential to the extent possible and will only be disclosed with your permission or as required by law. The following steps will be taken to ensure this confidentiality:

- If your name is mentioned during the videotapes, your name will never be mentioned in the reported results.
- You can end your participation at any time.
- Only the researcher team will have access to the data and it will be stored on a secure network.

Statement of Fair Treatment and Respect
UNC Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the university's Research Compliance Office (704-687-1871) if you have questions about how you are treated as a study participant. If you have any questions about the actual project or study, please contact Elizabeth N. Reyes at Elizabeth.reyes@uncc.edu or the responsible faculty member, Dr. Charles Wood at 704-687-8395 (or via email at clwood@uncc.edu).

Participant Consent

I have read the information in this consent form. I have had the chance to ask questions about this study, and those questions have been answered to my satisfaction. I am at least 18 years of age, and I agree to participate in this research project. I understand that I will receive a copy of this form after it has been signed by me and the principal investigator of this research study.

_____ _____
Participant Name (PRINT) DATE

_____

Participant Signature

_____

Participant Email Address

_____ _____

Investigator Signature DATE

APPENDIX D: STUDENT ASSENT FORM

UNC CHARLOTTE

Department of Special Education and Child Development
9201 University City Boulevard, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.2916 www.uncc.edu

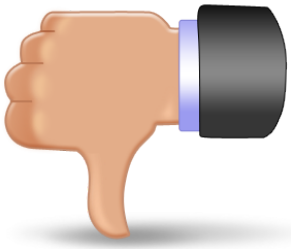
Student Assent for
Effects of Video Modeling on Completion of Transitions in Inclusive Settings

August xx, 2019

Dear Student:

"My name is Elizabeth Reyes. Do you want to work on making transitions with me and the paraprofessional in your classroom {insert name}? When we make transitions, we will use an ipad to make and watch videos of you making transitions. We will work together in your classroom with your teachers and classmates. You do not have to work with me if you don't want to. It is your choice and no one will be mad at you if you do not want to with me. Would you like to learn how to make transitions and work with me over the next few weeks?

An adult has read this to me. My choice is:

YES	NO
	

_____ _____ _____
Student Name Student Signature Date
(stamp and/or student response recorded, if unable to sign)

Researcher's Signature Date
This form was approved for use by the UNCC internal Review Board on _____, expires _____.

APPENDIX E: TRANSITIONAL ROUTINE DATA COLLECTION FORM

Date:	**Researcher:**	**Video model provided: Y N**	**Assessor:**
Phase:		**____ / ___ Steps Completed**	**Independent: ____%**
IOA on Student Data: %		**Transitional Routine: Morning routine (typically starts at 8:00am)**	
Start time:	**End time:**	**Duration:**	**Transition #: 1**

Instructions:	
Circle "I" if student performs step correctly with no prompt; Circle each prompt level used, starting from lowest to and stopping at most intrusive or "no response" *Each step must be completed within time limit listed by each step to be considered independent. Time begins from initiation of step to completion of step.*	*Response interval of 5 seconds required between each prompt level.* *I- Independent* *GP- Gestural Prompt* *VP- Verbal Prompt* *M- Modeling* *PP-Partial Physical Prompt* *NR- No response or does not complete*

Transitional Routine Steps	**Time Limit**	**Student response to SLP**					
1. Set book bag on floor	10 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
2. Take off jacket (if applicable)	20 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
3. Hang jacket on hook (if applicable)	20 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
4. Unzip book bag	5 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
5. Take lunch box out of book bag	15 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
6. Set lunch box on shelf	20 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
7. Take homework folder out of book bag	5 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
8. Put homework folder in bin	10 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
9. Hang book bag on hook	10 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**
10. Go to assigned seat	15 seconds	**I**	**GP**	**VP**	**M**	**PP**	**NR**

APPENDIX F: PROCEDURAL FIDELITY FORMS

Morning Work to Leisure

Date: _____ Condition: Baseline
Assessor:_____ Student is shown video model: Yes or No

Coding legend: **+** = step completed by para; **-** = step not completed by para;
0 = no opportunity to complete the step

Procedural steps Task analysis (steps in TA) →	1	2	3	4	5	6	7	8	9	10
Deliver task direction (gen ed teacher or para)										
Wait 5-10 sec										
If student responds correctly, wait for student to attempt next step										
If student responds incorrectly or does not respond, paraprofessional completes step for student and waits for student to attempt next step										
Total number of steps completed correctly										
Percentage of steps completed correctly										

Date: _____ Condition: Intervention (SLP)
Assessor:_____ Student is shown video model: Yes or No
Coding legend: + = step completed by para; - = step not completed by para;
0 = no opportunity to complete the step

Procedural steps Task analysis (steps in TA) →	1	2	3	4	5	6	7	8	9	10
Deliver task direction (gen ed teacher or para)										
Wait 5-10 sec										
If student responds correctly, deliver R+										
If student responds incorrectly or does not respond, error correction or delivery of prompt level 1: GP										
Wait 5-10 sec										
If student responds correctly, deliver R+										
If student responds incorrectly or does not respond, error correction or delivery of prompt level 2: VP										
Wait 5-10 sec										
If student responds correctly, deliver R+										
If student responds incorrectly or does not respond, error correction or delivery of prompt level 3: MP (video clip)										
Wait 5-10 sec										
If student responds correctly, deliver R+										
If student responds incorrectly or does not respond, error correction or delivery of prompt level 4: PP and move on to the next step in the task analysis										
Total number of steps completed correctly										
Percentage of steps completed correctly										

Date: _____ Condition: CRF or IRF
Assessor:_____ Student is shown video model: Yes or No

Coding legend: + = step completed by para; - = step not completed by para; **0** = no opportunity to complete the step

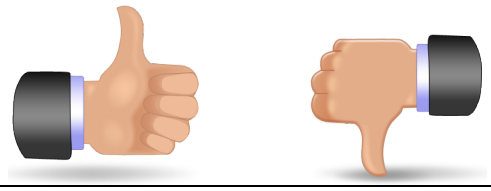
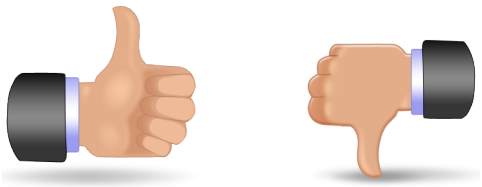
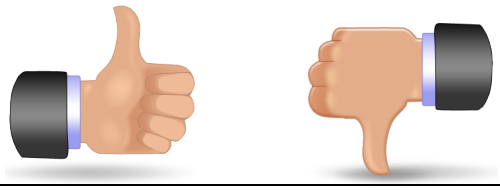
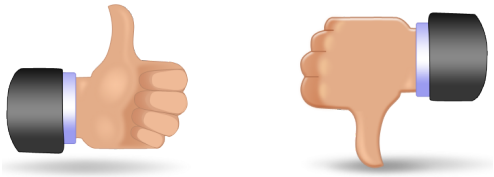
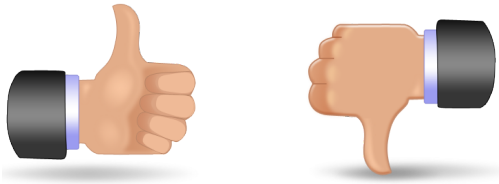
Procedural steps Task analysis (steps in TA) →	1	2	3	4	5	6	7	8	9	10
Deliver task direction (gen ed teacher or para)										
Wait 5-10 sec										
If student responds correctly, deliver reinforcement										
If student responds incorrectly or does not respond, NO R+, then paraprofessional completes step for student and waits for student to attempt next step										
Total number of steps completed correctly										
Percentage of steps completed correctly										

APPENDIX G: TEACHER AND PARAPROFESSIONAL SOCIAL VALIDITY QUESTIONAIRE

Statement	**(1) Strongly Disagree (3) Neutral (5) Strongly Agree**				
1. The participant enjoyed the intervention.	1	2	3	4	5
2. The intervention improved the participants' transitioning skills between task/activities in the classroom/school building.	1	2	3	4	5
3. The intervention improved the participants' ability to transition more independently.	1	2	3	4	5
4. The intervention decreased the amount of time needed to prompt the student through a transition and decreased overall time to complete the full transition.	1	2	3	4	5
5. I would use this intervention in the future.	1	2	3	4	5

Were there any challenges or difficulties associated with the intervention? If so, how would you change the intervention?

APPENDIX H: STUDENT SOCIAL VALIDITY QUESTIONAIRE

Did you like using the iPad?	
Did you like watching videos of how to do things?	
Did you like watching videos of yourself making transitions?	
Did you feel more independent making transitions?	
Did you feel like transitions in other classes became easier to do?	

APPENDIX I: TASK ANALYSIS OF TRANSITIONAL ROUTINES

Transition Steps

Morning Work to Leisure	Phonics to Math	Packing Up Lunch
1. Open morning work folder (5 s)	1. Open phonics folder (5 s)	1. Close thermos container (10 s)
2. Put completed worksheet (10 s)	2. Put completed worksheet in folder (10 s)	2. Put thermos container in lunch box (5 s)
3. Close folder (5 s)	3. Close folder (5 s)	3. Put spoon in lunch box (5 s)
4. Stand up (5 s)	4. Put phonics folder in phonics box (5 s)	4. Close lunch box (5 s)
5. Walk to Morning Work "turn in" bin (10 s)	5. Stand up (5 s)	5. Zip lunch box shut (10 s)
6. Put folder in Morning Work "turn in" bin (5 s)	6. Push in chair (5 s)	6. Stand up (5 s)
7. Pick up Brain Break bin (5 s)	7. Pick up math folder (5 s)	7. Push in chair (5 s)
8. Walk back to desk (10 s)	8. Pick up bag of math blocks (5 s)	8. Pick up trash items (5 s)
9. Sit down (5 s)	9. Walk out of classroom with paraprofessional (10 s)	9. Walk to trash can (10 s)
10. Pull Brain break item out of bin (10 s)		11. Walk back to table (10 s)
		12. Pick up lunch box (5 s)
		13. Line up with class (10 s)

Note. The text in parentheses refers to the time allotted for each step

APPENDIX J: BEHAVIORAL SKILLS TRAINING WRITTEN DIRECTIONS

Baseline Procedures for Paraprofessional

- Use list of transitional routine steps for each transition to follow in order
    - Each transitional routine should begin with a task direction delivered by the general education teacher, if not then the paraprofessional can give the task direction
        - The task direction should be general without listing any of the specific steps for the transitional routine
    - If student completes the step independently → then wait and watch to see if he completes the next step independently (count to 5)
    - If student does not complete a step after waiting 5 seconds → then complete the next step for him and walk away
    - Continue in between each step for each transitional routine
- Keys to success
    - Make sure not to linger too close to the student or give eye contact in a way that will indicate you are still watching him between steps
    - Try to look busy in between steps while you are counting
    - Use the table to remember baseline procedures

Baseline Procedures

*Begin with task direction for beginning of transitional routine from general education teacher or paraprofessional

If…	Then…
If student completes the step independently…	Then wait and watch to see if he completes the next step independently (count to 5 slowly)
If student does not complete a step after waiting 5 seconds…	Then complete the next step for him and walk away

Intervention Procedures for Paraprofessional

- Use list of transitional routine steps for each transition to follow in order
    - BEFORE the transitional routine begins, show the student the video-self model of him completing the total transitional routine that is coming up within 2 minutes of the start of the transition
        - Make sure student is watching the ipad and replay if attention waivers from the ipad screen
        - You can make commentary stating the steps while he is watching and praising his performance in the video model

    - Each transitional routine should begin with a task direction delivered by the general education teacher, if not then the paraprofessional can give the task direction
        - The task direction should be general without listing any of the specific steps for the transitional routine

    - If student completes the step on his own at any point then deliver quick positive praise (i.e., say "good job" and/or high five) then wait and watch to see if he completes the next step independently (count to 5)
        - Use more intense praise (i.e. high five) for fully independent

    - If he does not complete the next after wait 5 seconds in between each step, then deliver the next prompt in the hierarchy of the system of least prompts, then wait again for 5 more seconds
        - Prompting hierarchy to be followed in this order…
            - Gestural Prompt (GP)- pointing in direction of the materials or location for the step being prompted
            - Verbal Prompt (VP)- Tell student verbally what the next step is using how it is described on the list of steps for each transitional routine
            - Model Prompt via Video clip (MP)- Show student on ipad just the step being prompted from the full-length video self-model
            - Partial Physical Prompt (PP)- hold student's hand, use hand over hand, or guide the student by placing your hand on his shoulder towards materials or location involved in next step
    - Use less enthusiastic praise (i.e. a gestural thumbs up or quick "good job" for any steps completed that had to be prompted)
    - Stop moving through the prompting hierarchy as soon as student performs step in response to a prompt and wait (5 seconds) for student to initiate next step
    - Continue in between each step for each transitional routine

- Keys to success
    - Make sure not to linger too close to the student or give eye contact in a way that will indicate you are still watching him between steps
    - Try to look busy in between steps while you are counting
    - Use the table to remember intervention procedures

Intervention Procedures *Begin with task direction for beginning of transitional routine from general education teacher or paraprofessional *Show video-self model of student completing the transitional routine within 2 minutes of expected transitioning time		
If…	Then…	Codes
If student completes the first step independently…	Then deliver quick positive praise (smile and high five)	R+ (Reinforcement) *high praise for fully independent*
If the student does not complete a step independently…	Then, give a gestural prompt (point at materials or location for next step) and wait 5 seconds for initiation of next step *Stop here if student completes step in response to GP	GP (Gestural Prompt) *less enthusiastic praise for prompted*
If the student STILL does not complete a step independently…	Then give a verbal prompt (tell student the next step) and wait 5 seconds for initiation of next step *Stop here if student completes step in response to VP	VP (Verbal Prompt) *less enthusiastic praise for prompted*
If the student STILL does not complete a step independently…	Then give a model prompt (Use video self-model and show only the step missed by the student) and wait 5 seconds for initiation of next step *Stop here if student completes step in response to MP	MP (Model Prompt from video self-model) *less enthusiastic praise for prompted*
If the student STILL does not complete a step independently…	Then give a partial physical prompt (hold hand or use hand over hand) and wait 5 seconds for initiation of next step *Stop here if student completes step in response to PP	PP (Partial Physical Prompt) *less enthusiastic praise for prompted*
If the student STILL does not complete a step independently…	Then complete the step for the student and wait (5 seconds) for initiation of next step	Counts as NR or no response