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Under the Umbrella: Strategies for Working with ASD Students

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Under the Umbrella:
Strategies for Working with ASD Students

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Introduction to the Study

According to a 2018 study published by the Centers for Disease Control and Prevention (CDC), it is estimated that 1 in 59 school-age children in the United States have been identified as having an Autism Spectrum Disorder (ASD) of some kind (Baio, et al. 2018). This is an increase from the 2016 media release estimating 1 in 68 school-age children, and a drastic increase (approx. 120%) from studies conducted in 2002, which estimated that 1 in 150 children were identified with ASD (CDC, 2018). On a global level, it is estimated that 1 in 160 children have a diagnosed ASD, but the accuracy of this information is limited due to low- and middle-income countries as well as the methods for evaluating and reporting ASD among countries consistently (World Health Organization, 2017). ASD was once referred to as autistic disorder, but the Diagnostic and Statistical Manual of Mental Disorders (*DSM-5*, 2013) notes that it was expanded to become an umbrella term that now includes: early infantile autism, childhood autism, Kanner's autism, high-functioning autism, atypical autism, pervasive developmental disorder- not otherwise specified, childhood disintegrative disorder, and Asperger's disorder (American Psychiatric Association, 2013).

With the increased prevalence of ASD in recent decades comes a consistent need for knowledge about these conditions, including how they come about and how best to address them in a variety of common settings such as hospitals/medical offices, schools, parks, and at home. One of the most critical settings to explore with regards to individuals with ASD is the realm of education. Children and adolescents spend nearly one-third of their hours awake in school or education-related settings each week, making this a critical amount of time to spend ensuring their needs are met. Students with ASD receive special education services and are covered under the Individuals with Disabilities Education Act (IDEA). One of the main purposes of IDEA is to

ensure that all children with disabilities have access to a free appropriate public education, along with related services designed to meet their unique needs (Individuals with Disabilities Education Act [IDEA], 2004).

Definition of Terms

Attention-Deficit/Hyperactivity Disorder (ADHD). This refers to a neurodevelopmental disorder that is characterized by impaired levels of inattention, disorganization and/or hyperactivity-impulsivity. Roughly 5% of children and 2.5% of adults have ADHD, although it is more frequent among males than females. This sometimes co-occurs with Autism (APA, 2013).

Anxiety. In the most generic form, anxiety is an anticipation of future threat. When looking at anxiety as it relates to individuals with ASD, the most common anxiety disorders that manifest are selective mutism (failure to speak in social situations where speaking is expected) and social anxiety (avoiding social situations and/or enduring them with intense fear or anxiety) (APA, 2013).

Asperger's Syndrome. Prior to the *DSM-5*, Asperger's was a Pervasive Developmental Disorder (PDD) separate from autistic disorder. It is marked by significant impairment in social interactions and restricted, repetitive patterns of behavior, interests, or activities. However, there are no significant delays or impairments in language, cognitive development, self-help skills or adaptive behavior. (American Psychiatric Association [APA], 2000).

Autism spectrum disorder (ASD). Persistent deficits in social communication and social interactions are the hallmark characteristics of ASD. The condition is also characterized by the presence of repetitive patterns of behavior, interests, or activities, which are identified in

conjunction with the social deficits (APA, 2013). Clinical features of students with ASD (for example, restricted focus, literal and concrete understandings of text) may also interfere with their ability to regulate their attention, integrate new information and comprehend text (APA, 2013; Howorth, 2016).

Educational setting. This describes any context or location where a child might receive instruction. This includes, but is not limited to, classrooms (inclusive, self-contained, etc.), libraries, services centers, treatment clinics, and within the child's home (Lequia, 2015).

High-functioning Autism. This refers to Autism spectrum disorder without an accompanying intellectual impairment. A person is said to have an intellectual impairment when their IQ is lower than 70 points (*DSM-5*, 2013); therefore, an individual with high-functioning Autism would have an IQ measure of 70 points or higher. This was previously referred to as Asperger's Syndrome in the *DSM-IV-TR* (APA, 2000).

Multi-tiered System of Support (MTSS). This is an umbrella term that includes some commonly known frameworks such as "Response to Intervention" or RTI, and "Positive Behavioral Interventions and Supports" or PBIS (Rosen, Understood.org). It is described as "a process of systematically documenting the performance of students as evidence of the need for additional services after making changes in classroom instruction... [in order to] change the way schools support students with learning and behavior problems" (PBIS.org). This works in a tiered system and delivers both academic and behavioral supports.

Neurodevelopmental disorder. This refers to a condition that typically manifests in the early stages of the developmental period, often before a child enters grade school (i.e. prior to age 5), and can impair functioning in personal, social, academic, or occupational capacities.

Autism spectrum disorder and ADHD are two examples of neurodevelopmental disorders (APA, 2013).

Pervasive Developmental Disorder- Not Otherwise Specified (PDD-NOS). Prior to the *DSM-5*, PDD-NOS was used as a diagnosis separate from autistic disorder. This diagnosis is used when an individual displays significant and pervasive impairments in the development of reciprocal social interaction, verbal and nonverbal communication skills, and stereotyped behavior, interests, and activities but does not meet all the criteria for autistic disorder. One reason for this is the age of onset (APA, 2000).

Sensory intervention. This refers to any approaches used to address emotional and behavioral problems caused by sensory processing issues. These interventions may include modifying the sensory environment (lights, sounds, temperature, etc.), introducing task modifications (timers, visual schedules, etc.), and/or providing additional opportunities for students to receive sensory input such as brain breaks and kinesthetic lesson formats (Mills, 2018 and Wan Yunus, 2015).

Transition behaviors. Any actions that occur when a student is expected to shift from one task or activity to the next one during a school day (Lequia, 2015).

Typical peers. These are individuals who have not been identified with a disability and do not receive special education services. When included in a study, they represent similar ages, ethnic backgrounds, and socioeconomic backgrounds found in the primary participant population (Wolfberg, 2015).

Historical Background

The passage of various laws and regulations regarding those with disabilities and how they should be addressed has made significant changes to education systems over the past several decades (and through the course of the century). This has not always been a smooth transition and required many people to change their entire mindset towards these individuals. Measures that were once thought of as best practices were challenged over time and eventually exposed to be ineffective and, in many cases, detrimental to the success and well-being of individuals with exceptionalities. Robert Osgood (2005) tracks this transition in his book, *The History of Inclusion in the United States*, and provides key insights that are helpful in providing this background. These insights are discussed in the remainder of this section.

From early centuries to the 1930s, individuals who displayed any characteristics of a perceived disability were isolated from others. Most often, this meant being institutionalized. These individuals were abandoned by their families because a lack of understanding about their conditions marked them as unhealthy and defective. This began to change in the 1930s and was especially sparked during President Hoover's term. A White House Conference on Child Health and Protection was convened and a report on "The Handicapped Child" was prepared in 1933. This document discussed many areas regarding disabilities and recommendations related to the education and treatment of those individuals, which would help to eventually develop an area of education known as special education. This provided a platform to begin dialoguing about changes to be made.

The late 1950s and 1960s saw many challenges in the area of education. Desegregation efforts, the "space race", and increased conversations regarding civil rights sparked a decade of change. In 1958, President Eisenhower's administration passed PL 85-926, which gave federal

support to train teachers and equip them to educate students with what was then called mental retardation (now referred to as cognitive or intellectual disabilities). Efforts were being made to actively reform special education.

In the 1970s and 1980s, the concept of mainstreaming was proposed as an alternative to the segregation of individuals with disabilities. Mainstreaming refers to including individuals with disabilities in the general education classroom with their nondisabled peers. This was sparked by the passing of PL 94-142, which mandated that each child was guaranteed access to a free appropriate public education regardless of their disability status. This was reauthorized in 1990 as the Individuals with Disabilities Education Act and emphasized the responsibility of “regular” classrooms to provide adaptations for students. It also highlighted the importance of placing students in the least restrictive environment. The 1990 renewal of IDEA made important additions to the list of recognized disability categories were also made, including traumatic brain injury and autism. IDEA was reauthorized again in 2004, to demonstrate an increased knowledge of disabilities and an expansion of the rights those individuals have, as well as the increased responsibilities of education systems.

Statement of the Problem

Under IDEA, children who have been identified as having a disability will have an individualized education plan (IEP) drafted by their school’s special education team. This is a legally binding document that outlines the scope of the disability as it relates to that specific child, highlighting the academic, behavioral, communication, and functional needs, as well as how they will be addressed, and which professionals will be involved (e.g. general education teacher, intervention specialist, occupational therapist, speech therapist) (IDEA, 2004). Strengths and interests of the individual are noted, along with services and interventions that will be

included in the child's educational experiences. As mentioned previously, IEPs are highly specific to meet each individual where they are and move them towards increased progress and success. That being said, many of the services prescribed and interventions proposed can be somewhat generalized to meet the needs of a special education population, or at least to serve as a starting point. The specific research question that is explored in this study is, "What does research say about strategies to implement with students who demonstrate Autism Spectrum Disorders?". Elise Pas et al. (2016) noted that "over 455,000 students with ASD are served under the Individuals with Disabilities Education Act (IDEA) in schools, representing the highest number in history." Such a large group of individuals who have potential challenges when entering the realm of education should be met with supports and interventions aimed to increase the level of success that they can achieve. Incorporating these supports and interventions requires the availability of adequate interventions, or the creation/discovery of new ones, and ensuring that teachers are highly prepared to implement them with fidelity and confidence. This is an important matter that permeates all areas of education, including pre-school years, K-12 schooling, adult education, and general education/inclusion, and is not limited to self-contained special education alone.

Rationale

Scope of the Study and Delimitations

This literature review examines the four broad categories of strategies that have been implemented with individuals diagnosed with ASD: academic interventions, behavioral/social supports, student perceptions and teacher-focused studies (including teacher preparation, professional development/support, and effective teaching practices). In addition, the history and prevalence of autism over time is explored to provide a background and relevance for the study.

An explanation of autism spectrum disorders is also included to provide clarity and to establish a common starting point for the discussion. The scope of the study involves the identification and explanation of interventions that have been used to serve those with ASD, along with details regarding their effectiveness.

Autism spectrum disorders encompass many characteristics, diagnostic methods, and needs, as well as facets that can be highly unique to each individual. As mentioned previously, individuals with Autism typically present with noticeable deficits in social communication and interactions. It is also common for an individual with autism to engage in repetitive behaviors, activities and have fixated interests (i.e. dinosaurs, trains, sports) of which they become an expert. Approached as a whole, the topic of Autism can be studied in many ways and can become a huge project to undertake. For that reason, this study only focuses on the strategies used to meet the academic, behavioral, communication, and functional needs of individuals with ASD. Studies that focus on those in the traditional workforce, those involving infants, and those regarding medical procedures or treatments have not been included in this discussion. The participants involved in the included studies represent a wide range of ages, up to age 35 in some cases, but most have a formal ASD diagnosis. Other participants included represent educators or other professionals who work with those individuals. Each study set its own parameters for participant involvement.

Since autism is not a condition that is limited only to the United States, studies from other countries have been included. Research studies from Australia, France, and Sweden have presented some valuable insights and information that shows a consistency with ASD that is not limited by physical and political boundaries. Continued advances in technology, medical care, and awareness of conditions such as autism will hopefully begin to provide data from all around

the world in years and decades to come. The present study only focuses on research conducted and diagnostic criteria from within the past three decades. This is due, in part, to the availability of research in this time span compared to in decades prior but is also due to a desire to keep the information relevant to current times. Another factor in determining the time span for the inclusion of studies is the passing of IDEA in 2004 and the implications it brought for special education in the United States.

Significance of the Study

Historically, individuals with special needs were excluded from the general population in areas of education and, sometimes, in everyday life as well. As discussed previously, one common mindset seemed to be that those who were different were somehow lesser human beings and could, therefore, be treated as such (Osgood, 2005). Over time, and as people became more informed about various conditions and disorders, this mindset held by some individuals began to shift. It was slowly recognized that the individuals with exceptionalities were just as important as their typical peers, and that they had the same rights to education and treatment. This started a gradual shift in the education system, and special education was brought to the forefront of many education related issues.

In recent decades, specifically within the last 16 years, the prevalence of autism spectrum disorders has increased dramatically. There is some debate about whether this increase is due to a shift in diagnostic criteria, social/cultural/environmental factors, other factors not yet identified nor accounted for, or if there is a true increase in the prevalence of ASD. This study will not focus on that debate. Regardless of the reason, an increased prevalence of ASD provokes an increased need for research.

Conducting research regarding ASD can be, and often is, met with some limitations. For example, autism tends to be highly unique to each individual; general characteristics can be identified, but the list is not exhaustive by any means. Another limitation is that, at this point, there is little definitive information known regarding what causes autism (that is certainly a debate for another study) (National Institutes of Health, 2018).

Research has shown that early diagnosis and intervention can be highly beneficial for those with autism, but these things are not always utilized. Baio et al. (2018) noted that the median age of an ASD diagnosis was nearly 4.5 years old (52 months). This is significantly later than the early diagnosis age of 2 years (24 months) (CDC, 2018). In schools, many teachers lack adequate training regarding evidence-based interventions (Pas, 2016). This creates a question as to why. Are people uninformed about ASD and simply lack resources and ideas of interventions to try? Is it a lack of funding or a desire to only allocate a bare minimum budget? Or have educational practices simply not caught up to the research and needs presented? Whatever the reason, individuals with autism spectrum disorders are entitled to the best and most effective approaches to improving their everyday lives and future successes. This study hopes to highlight some of those interventions and strategies as research continues to look towards the future.

Methods of Procedure

The research process I decided to go through was to conduct a literature review, which includes articles that represent qualitative, quantitative, and mixed method research studies. By examining research and synthesizing connections made among research studies and population samples, the literature review provides a starting point for future research, as well as for educators and other professionals looking for strategies to implement.

I began my search with “strategies for working with autism students” and limited the results to studies conducted between 1990 and 2018. I located available research from online databases such as Academic Search Complete, EBSCO, OhioLink, Education Full Text and Education Research Complete, ERIC, and Google Scholar. The research studies I have gathered and decided to include in this discussion have all been conducted within the last decade.

My initial steps included thoroughly reading each article and then transferring some of the pertinent information into a template to organize it for later use. The templates were used to both organize the research studies into categories based on the types of strategies presented to the participants, and to write summaries of the studies. The studies were then compared to one another and information was synthesized to form the basis for the written literature review. My own personal professional experiences with people in the ASD population have influenced my desire to study this topic and to evaluate the strategies presented for my own use.

The articles I have selected meet the parameters of my research question and were included for several reasons. First, the research presented in the articles focuses on participants who are considered a part of the ASD population. Second, the variety of research articles represented qualitative, quantitative, and mixed approaches. Third, the studies clearly explained the results and conclusions obtained from administering the strategies and interventions to the participants. Finally, the research collected represented ASD populations from a variety of locations around the world. This helps to inform future research studies, along with actions by educators and other professionals in a way that can view ASD and strategies for working with that population in a more collaborative and innovative manner.

Looking at the Research

Just as every single individual is highly unique in all aspects of their lives (physically, emotionally, personality-wise, etc.), those with Autism Spectrum Disorders are highly unique from one another as well. ASD has some general characteristics, but every case has a distinct way of presenting itself. Emilie Boujut et al. (2016) highlights this observation in noting that, “the variety of individual manifestations of ASD is such that there is no unique educational rule that applies to all children affected”. Therefore, it is important for interventions to be specific rather than general, and for teachers to be adequately prepared to work with these individuals.

Academically-Focused Interventions

Generally speaking, traditional schools focus on academic instruction, personal development, and intellectual and social enrichment of students. Howorth et al. (2016) found that “a significant number of school-age children with ASD experience academic challenges...[and] despite documented comprehension deficits, limited work has been done on reading comprehension interventions for children with ASD”. The research included in this review of the implementation of academic interventions with students with ASD primarily is limited to English/Language Arts (ELA) instruction, although the availability of such research continues to be limited.

One strategy that has been suggested for enhancing students’ reading comprehension is to teach self-regulated strategy development, or SRSD. This is a scaffolded strategy that enables students to take ownership of their learning and monitor their own progress over time. Howorth (2016) explored the use of a specific SRSD strategy that is known as the “think before reading, think while reading, and think after reading strategy (TWA)”. This method utilizes prompts to

guide students through expository texts to increase their reading comprehension. The protocol was highly structured, concrete and repetitive- a method of instruction that most research notes regarding the thought processes of individuals with ASD (*DSM-5*). The participants in the study were 4 male students between the ages of 10-11 (5th and 6th grade). Each student was considered to be high-functioning and had an IQ between 91-111. Students were taught how to use the TWA strategy in a progressive model: instructor modeling, collaborative practice of the strategy, and student independent practice. (See Appendix A for examples of the prompts used.). There were 6 sessions conducted, each 45 minutes in length, that provided time for an introduction before the instruction and time afterwards for a review of the content and the child's performance. Two weeks after the 6th session, 3 maintenance measurements were taken to determine the students' retention of the strategy and comprehension skills. The total length of the study from start to finish is unknown.

Several outcomes of this study showed a benefit for the use of the TWA strategy to enhance reading comprehension skills in students with ASD, along with typically-developing students. On the satisfaction survey administered to students after the completion of the lessons, participants unanimously reported that the strategy had helped them to become better readers overall. Students noted that they had learned to slow down, take their time, and take steps to be more successful when reading. Linking prior knowledge to the text, focusing on reading speed and re-reading confusing text were skills that the participants highlighted as being particularly helpful to them. Data showed that the performance on the comprehension questions had a significant increase during the intervention phase (teaching the strategy to the students) and this increase was sustained later when a follow-up assessment was conducted (during the maintenance phase). One limitation worth noting is that the study was conducted with only 4

participants; however, the study was the first to gauge the effectiveness of TWA with students with ASD and the results suggest a benefit that should be explored in greater depth with a larger sample size.

Another reading-based academic intervention that was explored was discussed in a study conducted by Whalon et al. (2013). No participants were directly involved or discussed in the study; rather, the authors thoroughly described the strategy and provided a rationale for its use. However, the targeted population for the explored strategy is young children (3-5 years of age) with ASD in a heterogeneous classroom setting. The purpose of the study was to look at a pre-existing shared reading intervention (dialogic reading) and adapt it to better serve the needs of individuals with ASD. Dialogic reading targets oral language and print knowledge through responsive interactions and prompts. The question prompts can be organized using the acronym CROWD and the interaction sequence is typically scaffolded using the PEER model; both acronyms are explored in greater detail in Appendix B. Results from the study suggest that dialogic reading intervention is a worthwhile strategy for young children with ASD. Whalon et al. (2013) developed an additional strategy (called RECALL) to use with the dialogic reading intervention system.

RECALL (Reading to Engage Children with Autism in Language and Learning) was developed as a strategy to provide additional structure and supports for children with ASD using the dialogic reading intervention framework. RECALL focuses on four areas of development that are often problematic for children with ASD to acquire and provides instructional adaptations at two different levels. The four areas of development that are addressed are: joint attention, social reciprocity, inference making, and language. Joint attention refers to the ability to coordinate attention between people and objects using skills such as shifting eye gaze between

subjects and attending to a social partner. Having the ability to focus on people and objects during a lesson is critical to the child's ability to meaningfully absorb and retain information. Social reciprocity involves initiating and responding to conversations and instructional discussions. For children with ASD, prompting and direct models are most often used to enhance/create the skills of joint attention and social reciprocity. Inference making deals with interpreting information that is not explicitly stated in a text or conversation. Since children with ASD often struggle with expressive/receptive speech, including discerning thoughts and feeling of others, a difficulty with inferences becomes very common. This skill is directly linked to future reading comprehension success, so instruction including a direct focus on inference making should be provided as early as possible. Adult support, prompting, and having students replicate modeling have shown to be promising, and children with ASD in first grade have been observed using inference making skills independently. Each of these areas affect a child's ability to meaningfully absorb information, connect to text and peers, and build a foundation for future reading comprehension.

The language intervention component provided in RECALL is presented in two different levels, with different goals, to better meet the children's needs for different supports and prompts. Level 1 is considered the "first words level of language development" and focuses on expanding on the function and frequency of communication, turn-taking, expanding word knowledge, and improving language comprehension, along with other skills. A typically developing child will be in this phase around 12-18 months of age, but this can be vastly different for children with ASD. Level 2 is the "word combinations level of language development". In this stage, children are in the emergent state of language and their vocabulary is rapidly expanding. Instruction here focuses on expanding the children's communicative

utterances, improving inference-making and social reciprocity skills, and increasing the complexity of their initiations and responses. A typically developing child is in this phase around 18-30 months of age but, as mentioned, this will vary immensely for those with ASD. Children in Level 2 receive many of the same prompts as those in Level 1 but are presented with open-ended and closed questions with more complexity. In Level 2, the children are also often taught to use a self-monitoring system to document their initiations and responses.

The RECALL strategy uses the CROWD prompts and PEER instructional model but augments them with additional prompts and the introduction of a prompting hierarchy when needed. Four additional prompt types were added: emotion identification (how a character feels), secure attention (which is used to establish joint attention), intentional pause (to encourage initiation), and initiation (explicitly prompting a child to initiate an interaction, when needed). Visual supports to assist with expressive/receptive communication and self-monitoring, as well as to encourage joint attention, were also incorporated. Using the instructional sequence provided in the PEER model, the child is given a prompt followed by 3-5 seconds of wait time. If the child does not respond to the initial prompt that is given, then the prompting hierarchy is introduced. This hierarchy begins with the presentation of a binary choice to help the child answer the original question/prompt. If the child does not respond to this second prompt, then a direct model of the answer is provided. The child is then asked to repeat the response back to the teacher. The instructional sequence continues for the remainder of the lesson.

The results of the study by Whalon et al. suggested several considerations to be made before implementing the strategy. Factors such as the group composition and size, the age of the children, their range of developmental and ability levels, the length of the instructional session, and the teacher's ability to manage groups must all be considered. The key factor is ensuring that

all of the children can have an opportunity to initiate and respond to the prompts, and that the teacher can easily question and prompt all children. Several ideas for monitoring the progress of the children were shared, which allows teachers (and researchers) to better track the success of the strategies. Preliminary conclusions from this research showed that the RECALL strategy can be effective in helping students with ASD to develop the skills that are necessary for providing greater opportunities for learning and success in the future.

As noted at the beginning of this section, many students with ASD experience academic difficulties, especially in reading/ELA. There is limited research regarding interventions in this area, but a common approach being explored is the use of scaffolded strategies. Howorth's (2016) exploration of the TWA strategy showed that a highly-structured instructional model allowed students to progressively increase their ability to independently work through an expository text. Although Whalon's (2013) review of a shared reading intervention focused on a completely different age group of children, it showed a similar amount of promise as Howorth's strategy. Both strategies outlined a format that enabled students to observe modeling, receive guided feedback during practice, and to have prompting supports when needed. Both studies show that this approach to instruction creates more meaningful connections between the students and the instructional material and enables them to take a more active role in the process, which leads to greater retention and increased opportunities for success in the future. While the included studies focused on ELA, educators and researchers could try this instructional model in other academic subject areas and explore the effectiveness for students across the curriculum.

Behavioral/Social Interventions

Autism Spectrum Disorders typically have several social, behavioral, and/or emotional factors that need to be addressed in addition to the cognitive or academic considerations.

Children seem to enjoy playing; they can be seen at parks, on playgrounds, at the beach, in backyards, in living rooms, and many other settings. In daycares and primary schools, children have recess and many early childhood classrooms incorporate centers and other play-based activities. As mentioned previously, one hallmark of Autism Spectrum Disorder (ASD) is persistent social deficits (APA, 2013). Pamela Wolfberg et al. (2015) notes that some of these deficits include challenges in the development of symbolic play and social engagement with peers. As a result, children with ASD are at risk for social isolation, neglect from peers and future social difficulties. The study Wolfberg conducted served as a component of a larger research project that explored the efficacy of the Integrated Play Groups (IPG) model (2015) and its therapeutic benefit for children with ASD. Two sets of participants were involved in this study: The primary focus group consisted of 48 children with ASD, and the secondary group contained 144 typical peers. All of the children included in the study were 5-10 years old. The study was 2 years in length.

This quantitative study was organized into four phases of observation periods that were about 12 weeks apart, which corresponds to the length of the IPG phase. The baseline, pre-treatment, and post-treatment phases consisted of 15-minute sessions where groups (1 with ASD, 2 unfamiliar peers) were presented with play materials and a prompt asking what the group could do with the materials. The IPG phase was structured differently: Groups of 5 children (2 with ASD and 3 typical peers; providing a higher ratio of experts to novices) participated in 60-minute sessions twice a week. These sessions contained at least 40-minutes of guided play.

The Integrated Play Groups study focused on the areas of symbolic and social play. The behaviors in these two domains are organized in a hierarchy of development and sophistication. Symbolic play behaviors range from not engaged to symbolic-pretend play, and social play

behaviors range from isolate to common goal (see Appendix C for more detail regarding these domains). All of the IPG sessions were held in designated playrooms within two public elementary schools. A high level of predictability was provided through consistent schedules and visual supports. The model encourages flexibility through guided participation in co-constructed play activities that consider the unique interests, abilities, and needs of each participant as well as the whole group (Wolfberg, 2015).

The IPG intervention showed significant increases for children with ASD in the areas of symbolic and social play. Specifically, the symbolic domain showed a significant decrease in not engaged and manipulation-sensory behaviors, and a significant increase in functional and symbolic-pretend play behaviors. In the social domain, there was a significant decrease in isolate and onlooker-orientation behaviors, and a significant increase in parallel-proximity and common focus behaviors. Wolfberg et al. (2015) explained a cyclical effect:

With improved play skills, novice players were able to find common ground with expert players in play. This, in turn, encouraged novice and expert players to continue seeking each other out and engaging together in play, which allowed for further practice and refinement of symbolic and social play abilities (p. 841).

These findings support the idea that play can have many therapeutic benefits to increase the development and social inclusion of students with ASD.

Children with ASD often exhibit repetitive behaviors, interests and activities, and they are typically in conjunction with a preference for and inflexible adherence to specific routines (APA, 2013; Lequia, 2015). This inclination for familiar routines, along with characteristics such as restricted focus, create an element of rigidity that can cause immense difficulties with

transitions (Howorth, 2016; Lequia, 2015). Since roughly 25% of the school day consists of some type of transition (Schmit et al., 2000; cited by Lequia, 2015), a number of studies have been conducted regarding transition behaviors for students with ASD. Jenna Lequia et al. (2015) conducted a quantitative evaluation of 14 research studies that were conducted between 1987 and 2011. The purpose was to examine the interventions used for transition behaviors in students with ASD. The research studies were organized according to specific categories and then coded according to their evaluation. The participants in the included studies ranged from 3-13 years old (24 males and 4 females).

The three major categories used by Lequia et al. (2015) examine the main intervention component present, the behavioral topography addressed, and the transition type (in terms of location). Six main intervention components were explored: Activity Schedules (AS), Social Narratives (SN), Video Models (VM), High-p Procedure (HP), Reinforcement-based Procedures (RF), and Peer-Mediation (PM). Likewise, the 5 behavioral topographies included the following: aggression, off-task, inappropriate vocalizations, dropping to the floor, and elopement. The 3 transition types were across classroom, within classroom, and entering or exiting the school. The review conducted of the studies and of the included strategies suggests that all of the strategies evaluated in the literature show promising effects. An effect size was calculated for each of these subcategories and used to determine the significance each holds in benefitting students with ASD.

Lequia et al. (2015) used the following scale to determine the significance of the effect size: 0.93-1.0 indicates a strong effect, 0.66-0.92 indicates a moderate effect, and 0-0.65 indicates a weak effect. Of the 14 subcategories explored, 11 of them had an effect size of 0.932 or higher, showing a strong significance. The remaining 3 subcategories (High-p Procedure,

aggression, and entering or exiting the school) fell in the moderate significance range (0.678, 0.905, and 0.853, respectively).

Two interventions reported strong effects for more participants than other strategies, which suggests that they might be the most promising in addressing transition difficulties: Social Narratives and Video Models. Social narratives include Social Stories™ and cue cards with behavioral expectations. Video models show the student (or a same-age peer) engaging in the desired behaviors. When looking at the behavioral topographies, it was also noted that interventions are more effective with less severe behaviors such as off-task behaviors; the studies only showed moderate effects when dealing with aggression. In the studies examined, these techniques showed the greatest chance of success for the following behaviors: aggression- SN and VM; off-task behaviors- AS, RF, and PM; inappropriate vocalizations and dropping to the floor- AS, SN, and VM; and elopement- VM. This provides a starting point of interventions to try, but additional research should be done to determine the effectiveness of these techniques over time (greater detail regarding these subcategories and their specific effect sizes can be found in Appendix D).

With approximately 25% of the school day consisting of transition times, it is vital to the success of students with ASD to have interventions in place to assist with the transitions they face. A poorly executed transition (or in some cases, not transitioning at all) creates a delay in the student's schedule, an increased strain in peer relationships, and other snowball effects. Improving transition behaviors in educational settings may lead to other socially significant outcomes, including increased time spent in academic instruction and increased inclusion in general education settings (Lequia, 2015).

In addition to social deficits and difficulties with transitions, students with Autism also commonly experience sensory processing difficulties (up to 95% of people with ASD, as cited by Mills, 2018). A qualitative pilot study was conducted by Mills and Chapparo (2018) that used semi-structured interviews to obtain information about teachers' perceptions of using a sensory-based intervention, called a Sensory Activity Schedule, in their classrooms. The study included 19 teachers from 7 autism-specific schools in New South Wales, Australia. These teachers had spent at least 10 weeks instructing their students prior to using the intervention. Each classroom contained 4-7 students, ranging in age from 4-12 years old.

The Sensory Activity Schedule (SAS) consists of specific and purposeful activities and environmental modifications to enhance occupational performance and improve student participation at school. It has five key components: evidence of need; child-centered (activities are selected according to child's sensory needs); used to promote performance in school tasks; teacher-directed; and seamless integration (the intervention fits into the context of the child's everyday life). The teachers were trained to use the SAS by school occupational therapists, with additional supports and follow-up meetings provided as needed. A specific length of time for the intervention was not mentioned, only that it was used for one school term (it is unknown if this refers to a full year, or part of a year such as a quarter).

One example provided in the study was an intervention provided for a student who may constantly seek movement and deep pressure sensations throughout the day. The intervention sequence implemented would include bouncing on a therapy ball and shoulder squeezing (for deep pressure input). These interventions would be used in order to promote the child's goal of moving to the desk when prompted and to be able to sit and complete two activities independently without getting up, for about 4 minutes (Mills, 2018). This is a tactic that can be

easily incorporated into the routines of the classroom, promoting seamless integration of the intervention tool.

After the school term, the teachers met with the occupational therapists again to participate in semi-structured interviews. The teachers were asked to share about their motivation for using the SAS, their perceptions on what was helpful, and their perceptions about what was inconvenient or unhelpful in the process. They were also encouraged to share any additional comments they might have had. The interview responses were then compiled and coded according to the information shared.

The research resulted in four key findings regarding the SAS intervention, its implementation, and the teachers' provided feedback. First, the teachers were able to identify the students whose classroom performance was negatively affected by sensory processing difficulties. However, they did not feel as though they had the knowledge and tools to assist the students effectively. This suggests that occupational therapists should partner with teachers more consistently in the future. Second, the teachers found the SAS intervention to be helpful for their students, and they were happy to have learned about new intervention ideas. This provides an encouragement to those looking to improve school based practices by implementing new strategies. The third finding was that the teachers were concerned with implementing the SAS intervention correctly. This highlighted a common disparity regarding the extensive training that therapists receive compared to the seemingly minimal preparation teachers receive in this area. Finally, the teachers' implementation of the SAS intervention was greatly impacted by time and staffing constraints. These findings stress the importance of interventions being as efficient as possible without sacrificing effectiveness.

Lequia et al. (2015), Mills and Chapparo (2018), and Wolfberg et al. (2015) examined practices to increase the behavioral and social performances of children with ASD. Each study (or set of studies, in the case of Lequia et al., 2015) explored interventions within an early childhood/elementary age range (3-13 years old). Wolfberg (2015) used guided and exploratory play to enhance and facilitate social interaction among children with ASD and their same-age peers (same-age peers were used directly in the IPG as models). Lequia (2015) also used same-age peers as models, but indirectly through social narratives and video models, to demonstrate desired behaviors. Both Lequia (2015) and Mills (2018) used interventions to increase the students' success with tasks within the classroom and school setting. Lequia focused on transition behaviors while Mills focused on occupational performance and student participation, but these are all vital skills for promoting access to instruction and academic success. In all three articles, the value of consistency and predictability is emphasized. Wolfberg (2015) and Lequia (2015) provided consistent schedules so that the child's success was not hindered by an unexpected activity or transition; Mills (2018) incorporated the sensory-based interventions into the child's everyday classroom schedule, allowing for a seamless integration of the intervention and an increased possibility for success. The article by Mills provided a glimpse into a global perspective, since the study was conducted in Australia. This highlighted that ASD is something that occurs globally, not just in the United States, and that similar interventions can be successful in various parts of the world.

Student Perceptions

When conducting any type of student-centered research, gaining the perceptions of the students themselves can provide a valuable insight into the study. Two research teams from different parts of the globe sought to expand the realm of research regarding Autism Spectrum

Disorders by conducting studies that focused on the individuals with ASD themselves and their own personal perspectives on how ASD and comorbid conditions, such as ADHD or anxiety, affect their everyday lives.

Researchers from the University of Gothenburg in Sweden explored an internet-based support and coaching (ISBC) model for adolescents and young adults with ADHD and ASD. These researchers recognized a demand for non-medical treatment and support for adolescents and young adults with ADHD and ASD. Sehlin et al. (2018) conducted a qualitative study that focused on the participants' own experiences, rather than just a third-party perspective. The study included 16 young men and women between the ages of 15-32, with a diagnosis of ADHD, ASD, or both. It involved an initial face-to-face meeting with a coach followed by 8 weeks of internet-based coaching sessions (two 30-60 minute sessions each week). The sessions were conducted using a chat program the participants could access from their homes, with the exception of two live meetings (held during weeks 3 and 6 of the intervention). The live sessions were conducted at one of two clinics near the participant's home. Prior to the intervention, the participants were given the opportunity to choose two topics that they wanted to focus on during the chat sessions. The 7 different coaches all had experience working with individuals with ADHD and ASD but were from different backgrounds. The group was comprised of two educational therapists, two trained social workers, two special education teachers, and one clinical psychologist.

After the 8 weeks of coaching, the participants were interviewed in order to gain their perceptions about the process and its relevance to/effectiveness in their lives. Single, individual, qualitative narrative interviews were conducted anywhere from 3-21 months after completing the ISBC intervention model. These interviews were semi-structured and encouraged the participants

to speak freely, as in a typical conversation, with the purpose of capturing their subjective experience (Sehlin et al., 2018). They were asked about their thoughts, experiences, and expectations, as well as the benefits and disadvantages of the coaching model. They were also asked about their perceptions regarding the coach's training and knowledge about ASD and ADHD.

An analysis of the interview data found that the internet-based support and coaching intervention was well-regarded by the participants. The participants specifically noted that this communication tool (the internet-based coaching) was helpful and provided support for handling problems in daily life. While this was a huge benefit, it did not fully take the place or significance of face-to-face interactions. The recommendation is that this intervention has advantages but should be used in addition to standard treatment as opposed to a stand-alone technique. Another benefit of this model was that participants did not have to travel to seek help. Many participants also appreciated the ability to use written communication through the online chat forum, since ASD has a characteristic of slow processing speed and many with ADHD have working memory deficits (Sehlin, 2018). With regards to perceptions of the coach's qualifications, it was noted that the combination of formal training, specific experience with ADHD and ASD (leading to a high level of competence), and a genuine interest helped to ensure a level of understanding and trustworthiness for the participant (Sehlin, 2018).

When interviewed, the participants showed a preference for the term "coaching" rather than using words like "treatment" or "rehabilitation"; this created a connection akin to a social contact, which made the process feel more easy-going and supportive. One participant in particular noted that it was like a friend that you don't have a personal connection to (Sehlin, 2018, p. 7). Long-term effects such as improved planning skills, self-confidence, a sense of

empowerment, and a better overall balance in life were also mentioned as positive outcomes from the coaching model. Suggestions for improving the intervention in the future included having a more flexible communication schedule (varying the amount or types of sessions, based on the participant's changing needs) and incorporating some activities outside of the home for the participant to engage in (with the goal of increasing exposure to things that are difficult or cause anxiety). The researchers concluded that the internet-based support and coaching model has implied specific advantages for adolescents and young adults with ASD and/or ADHD, which lends itself to being an important complement to standard treatment and support options (Sehlin, 2018).

Across the globe, researchers in Australia explored another comorbid condition commonly present in individuals with Autism Spectrum Disorders: anxiety. Trembath, et. al (2012) sought to study the impact of self-reported anxiety on everyday life, as well as the everyday experiences of young adults with ASD based on their firsthand experiences, and the reports of parents and professionals who support them. The study was set up in a qualitative way and consisted of two focus groups. The first focus group had 11 young adults with ASD, aged 18-35, and all were verbal. The second group had 10 participants, all who were either parents of individuals with ASD or professionals who worked closely with individuals with ASD.

The focus groups were held at the Olga Tennison Autism Research Centre at La Trobe University in Australia; these groups were 2 hours in length, with a 15-minute intermission. A semi-structured interview guide was used, and three main topics were addressed: (a) situations that elicit anxiety (triggers); (b) what happens when anxiety has been triggered (experiences and consequences); and (c) what helps young adults with ASD manage their anxiety (solutions). The second group (parents and professionals) also discussed how supporting the individuals with

ASD and anxiety affected their own lives. The participants were encouraged to say as little or as much as they liked and to bring up anything they felt was pertinent. They were also encouraged to write or draw their responses if they didn't feel comfortable answering orally and were told that if they felt overly anxious, they could choose to leave at any point.

In examining the participants' responses as they related to the three main themes, 10 subthemes emerged (some will be addressed here, but the full list can be found in Appendix E). In terms of sources of anxiety that were identified by the young adults with ASD, some of the primary concerns included environmental factors (such as lighting, crowded places, and concern about germs) and interactions with others (e.g. trying to adapt communication styles to please others, making eye contact, and feeling judged or closely watched by others). The focus group of parents and professionals also noted that interactions with others seemed to be a key source of anxiety for those with ASD. It was also mentioned by participants in both groups that other people involved in the interactions could play a role in mediating the anxiety experiences (Trembath, 2012). In the theme of the experiences or consequences of anxiety, some common things emerged regarding how anxiety impacts the individuals with ASD (noted by both groups of participants): obsessive thoughts/behavior, emotional responses such as crying or screaming, and high levels of frustration. Some participants also noted that these responses have impacted others around them, leading to misinterpretation, humiliation, and feelings of uncertainty.

The third theme looked at strategies for living and coping with anxiety. For preventing anxiety, participants noted that being organized, adhering to routines, and engaging in a consistent exercise program were all beneficial strategies. Another technique that was mentioned for preventing anxiety was to learn strategies for interacting with people without ASD using social skills books, online forums, and specifically asking people to teach them about expected

behaviors and social etiquette. When it comes to managing anxiety, Trembath et. al (2012) noted that the most common strategy was to escape, either physically or through diversion and distraction. This often occurs through going for a walk/run, listening to music, watching tv/movies, and/or playing video games. Talking with other individuals who understand what it's like to have ASD and anxiety (either through personal experience or professional training) was also mentioned as being a beneficial technique.

Overall, the findings of the study revealed that the sources, experiences, and strategies regarding anxiety are highly individualized. Trembath et. al (2012) found that anxiety is caused by unexpected change, social encounters, and many other situations, but there is a lack of understanding as to solutions that may assist young adults with ASD cope with the anxiety. A “one-size-fits-all” approach is unlikely to be successful since individual and environmental factors play a role in how anxiety affects and is coped with for those with ASD; it is important that future research keeps this in consideration. Future research should also note that the best source of information regarding how anxiety affects the lives of those with ASD are the individuals themselves, along with parents and professionals who work closely with them.

Despite one study being conducted in Sweden and another in Australia, similar findings emerged regarding young adults with ASD and comorbid conditions. Both Sehlin et. al (2018) and Trembath et. al (2012) interacted with individuals in the young adult stage of life (ages 15-35) and explored techniques to help these individuals to cope with problems they face in their daily lives. These two studies used qualitative approaches, gaining valuable insights through narrative interviews and focus groups. While Sehlin (2018) explored the presence of ADHD in those with ASD, Trembath (2012) looked at anxiety with ASD; however, both teams of researchers found that individuals with ASD noted that working with others (either through

support-based techniques like coaching or simply talking with those who can empathize) was perceived to be highly beneficial. It was also stressed that experiences and strategies were found to be markedly individualized, something that should be kept in mind for future research and those seeking to implement interventions. Gaining information from the individuals with ASD directly provided key insights and perceptions that may have been lost through other impersonal research methods.

Teacher-Focused Studies

Just as individuals with ASD can provide valuable insights regarding the things they face in everyday life and strategies for coping with the struggles that arise, professionals who work closely with those individuals can provide valuable information as well. One group of professionals that most commonly work with individuals who have Autism Spectrum Disorders, and traditionally spend a great deal of time with them in the course of a day, is teachers. As mentioned previously, children and adolescents spend nearly one-third of their hours awake in school or education-related settings each week. This makes teachers an extremely important part of their daily lives and it also means that teachers have a substantial amount of time to gain insights regarding these individuals. Therefore, exploring studies that focus on teachers can add to the discussion on strategies for those with Autism in a significant way. Articles that focus on teachers specifically have fallen into three subsections for this analysis purpose: teacher preparation; professional development and support; student engagement and effective teaching practices.

Teacher Preparation.

Regardless of the educational topic being discussed, teacher preparation programs are vital to the confidence of the teacher and, subsequently, the future success of the students that

teacher will have. Two different teams of researchers wanted to study the preparation teachers (or preservice teachers) receive, and how it impacts their experiences working with students who have emotional and behavioral disorders and those with Autism Spectrum Disorders. First, Shani Shillingford and Nancy Karlin from the University of Northern Colorado (2014) set out to examine the level of knowledge of emotional and behavioral disorders held by preservice teachers and the influence it has on their self-efficacy, especially in diverse classrooms. They took a convenience sample of 230 participants (students at a mid-sized Midwestern university; 80% of the participants were female), all general or special education majors who represented elementary education (K-6), secondary education (7-12), post-baccalaureate licensure in elementary education, and special education (K-12). These students ranged in age from 19 to 51 years old, with an average age of about 23 years old.

Shillingford and Karlin (2014) asked the participants to complete a 3-part survey. Part 1 consisted of the Teacher Self Efficacy Scale long form, which recorded participant responses to statements using a 9-point Likert scale. The statements specifically asked about three domains: instructional strategies, classroom management, and student engagement. Part 2 was a self-report questionnaire regarding their knowledge of emotional and behavioral disorders (EBD); this questionnaire was created by the researchers using vignettes and true/false statements based on information from the DSM-IV-TR (APA, 2000) and other researched sources. Part 3 simply asked for demographic information about the participants and their field of study. Data collection occurred in three different modes: the post-baccalaureate students were administered the study by their professors; the elementary, secondary, and one group of special education students had the survey administered by the researcher in a large class setting; the other group of special

education students met with the researcher outside of class in a research room. The data was then analyzed for further discussion.

The discussion of the data highlighted a few key things. When looking at the scores from the EBD questionnaire, most of the students scored between 4 and 9 points (out of 15); the mean score was 6.22, or 41%. The highest score was a 67%, which still shows a need for further preparation in this area. The preservice teachers reported higher senses of self-efficacy in the areas of instructional strategies, classroom management (specifically, for disruptive behaviors), and instructional abilities. A lower sense of self-efficacy was reported for student engagement. Also, implications were made that preservice teachers should be provided with more opportunities for authentic field experiences and interactions with students who have emotional and behavioral disorders. Future research should explore the effects of preservice teachers' authentic experiences. The researchers also discussed the potential benefits of conducting a longitudinal study to see how self-efficacy and knowledge of EBD changes over time, especially when incorporating those authentic experiences.

The second researcher that looked at teacher preparation was Dawn Hendricks from the Virginia Commonwealth University Autism Center for Excellence (2011). Her aim was to find information about characteristics of teachers who work with students with Autism and their teaching practices. This study had three major objectives: (1) Determine characteristics of special education teachers; (2) Identify effective teaching practices through self-reported information; and (3) Identify how these teaching practices are implemented. Hendricks surveyed public school special education teachers in Region 1 of the Virginia Dept. of Education, but the stipulation was that they had to have taught at least one student with Autism within the 5 years prior to the study. In total, 498 eligible teachers completed the survey.

A nonexperimental quantitative study was conducted using a self-report survey that referenced the *Virginia Skill Competencies for Professionals and Paraprofessionals Supporting Individuals with Autism Across the Lifespan* (Virginia Autism Council, 2005; Hendricks, 2011). In the survey, the participants were asked to self-rate their knowledge and implementation of effective teaching practices using a 5-point Likert scale. Prior to administering the survey to participants, a panel of experts reviewed the survey and a pilot test was conducted.

Despite teaching endorsements and, for half of them, substantial years of teaching experience (10 years or more), the results of the survey revealed that the participants only possessed low to intermediate levels of knowledge regarding Autism and effective teaching practices. This carried over into their reported levels of implementing effective teaching practices, which also fell into the low to intermediate ranges. Participants reported using the Individualization and Support Strategies most often, and Social Skills practices and Sensory Motor Development practices the least often (Hendricks, 2011). Implications for the future include preparing teachers to adequately and effectively teach students with Autism and to be able to address a range of learning needs. Teachers also need to be equipped to meet student needs as they adapt and change. Many of these preparations should not only be started at the preservice level, but also implemented through in-service and professional development opportunities.

As mentioned previously, both researchers wanted to study teacher preparation, the impact it has on their work with students who have EBD and/or ASD. In both studies, quantitative methods were used, asking participants to complete surveys using a Likert scale. Both studies had a relatively large number of participants: Shillingford and Karlin (2014) had 230; Hendricks (2011) had 498. Shillingford and Karlin focused on preservice teachers that

represented all major subject/licensure areas and specifically looked at their self-efficacy and knowledge regarding emotional and behavioral disorders. Hendricks limited her focus to special education teachers and looked at their work with students who have Autism Spectrum Disorders. In both studies, it was noted that teachers need to receive more extensive preparation in the areas of EBD and ASD, including more opportunities for authentic experiences at the preservice level, additional strategies to adequately and effectively teach students with these disorders, and to provide additional professional development opportunities for those already teaching. A suggestion was also made to conduct a longitudinal study to see how self-efficacy, knowledge, and effective teaching practices change and evolve over time. This could provide further insights in to future research and the development/adaptation of education programs (preservice and professional development).

Professional Development and Support.

Providing professional development opportunities and other methods of support for teachers can play a crucial role in their levels of confidence, stress, and in their abilities to meet the needs of their students effectively and efficiently. This support can come through many different forms, but two approaches will be explored here. Elise Pas et. al (2016) looked at a coaching model to assist teachers with managing behavior problems among students with ASD in the eastern part of the United States. Emilie Boujut et. al (2016) wanted to compare the experiences of teachers in France across different school settings and to see how transactional variables (explained more in depth later) affect teacher burnout.

As noted previously, there is a high prevalence of ASD in the United States: 1 in 59 school age children (Baio, 2018); this creates a need for highly-trained educators in order to adequately meet the needs of these students. However, Pas et. al (2016) noted that relatively few

teachers have training in the use of evidence-based interventions for students with ASD while addressing behavior problems in the classroom and additional professional development is needed to help teachers better support students. In light of this, Pas set out to explore the extent to which a coaching simulator was associated with an increased teacher capacity to address the diverse behavioral and learning needs of students with ASD.

In a mixed-method approach, a teacher-tailored coaching program was conducted that utilized a state-of-the-art mixed-reality simulator and a formalized coaching model with 19 teachers in two non-public special education settings serving students with moderate to severe ASD. The immersive, mixed-reality simulator, called TeachLivE™, uses a virtual classroom to provide immediate feedback to teachers' behavior. It is dynamic and responsive to what the teacher is doing in real-time. There are five computer-generated student avatars who have unique personalities and can be modified to fit the particular situation the teacher is trying to work on. This simulation method provides a unique form of guided practice to the teacher with an individualized approach but avoids exposing real students to the harms of teachers' unsuccessful attempts at using new skills (Pas et. al, 2016). Constantly attempting new skills on students with ASD could be detrimental to the social and behavioral progress that they've previously obtained.

The formalized coaching model that was used is called the Classroom Check Up (CCU). CCU is a staged problem-solving process that targets teacher classroom management skills, specifically addressing positive behavior supports. The coach met with the teacher for an interview to learn more about the teacher and his/her identified areas of strength and weakness (Pas, 2016). Classroom management data was then collected during three classroom visits and the coach provided feedback on strengths and areas for improvement. The teacher and the coach co-developed an action plan. The action plan was designed for 10 weeks and 1-2 target behaviors

for promoting positive student behavior were selected. The targeted skills were practiced for 2 weeks using the TeachLivE™ simulator. These hour-long lab sessions were done in pairs to allow for peer observation. The coach then conducted another classroom observation before scheduling the teacher for the 2nd and 3rd TeachLivE™ sessions.

It was found that many general and special educators lack basic classroom and behavioral management training, as well as a lack of training in core therapeutic techniques to use with students with ASD. In addition, as of 2016, 41% of graduate programs did not offer ASD-related coursework. This overall absence of evidence-based strategies and classrooms calls for future training opportunities for teachers and adaptations to preservice education programs. With regards to the coaching model, “the results indicated that this intervention shows promise as an effective and acceptable intervention with special educators.” Observations showed significant improvements in the teachers’ use of proactive behavioral expectations, the use of approval techniques, and classroom management strategies. The rate of student non-compliance reduced significantly over time and marked improvements in student behavior were noted. This study highlighted some helpful strategies for the future, as well as ways to improve the training of preservice teachers.

As it has been discussed, Autism Spectrum Disorders are not exclusive to the United States; research from several other countries has been included and examined. In France, the education system, as well as the approach taken with those who have ASD, is different from what typically occurs in the education systems within the United States. Emilie Boujut et. al (2016) wanted to compare the experiences of teachers dealing with students with ASD in different classroom environments. This was especially relevant because they found in their background research that teachers in France reported several difficulties when it comes to

working with students with ASD; for example, 75% of teachers expressed difficulties with the low level of autonomy of children with ASD, among other things (Boujut, 2016). This understandably increases the magnitude of stress in an already difficult position.

The study included 245 teachers working in France or a French territory (Guadeloupe, Martinique, and New Caledonia). The mean age was 41 years and they had an average of 14.8 years of teaching experience; the teachers represented both primary and secondary schools. Given the nature of school systems in France, the teachers were broken up into three different categories: 103 participants taught in a regular school and had a student with ASD in their classroom; 100 participants taught in a specialized setting with at least one student with ASD; 42 participants taught in a regular setting with no children with a disability. The teachers were asked to complete several different questionnaires which asked about various dimensions of burnout, perceived stress, perceived social support, and coping strategies. The survey took about 30-45 minutes to complete. The participants were given the option to complete it online or on paper (35% responded online and 65% on paper), and the study was conducted over 4 years to ensure an adequate sample size.

In the surveys, teachers reported more difficulties related to common characteristics of ASD. Low attention capabilities and concentration issues contributed to a significant amount of frustration, as well as the lack of social interaction and the presence of atypical and challenging behaviors. Some of the teachers mentioned feeling ineffective because of a lack of time, means, and/or support. Feelings of professional isolation added increasing levels of frustration and exhaustion.

An interesting thing to note is that teachers from specialized classes/institutions perceived their experiences more as challenges and less as threats or losses. These teachers felt like they

received more social support from colleagues and professionals. They also used more problem-focused coping strategies and their emotional exhaustion levels were lower, meaning they had greater protection from burnout. However, many of the specialized teachers in France only receive training once they are already working (in some cases, this occurs several years later). It was also noted that 20-50% of these specialized teacher positions are occupied by teachers that do not have the “specialized teacher” official title, yet they act in specialized teacher roles in specialized schools. This sometimes occurs for years before they enter an actual certification program.

The overall conclusion was that lack of training of some teachers can lead to maladjustment of the environment and can be detrimental for the student and the teacher. Teachers with higher levels of training with ASD students reported being less “burned out” than those who were not as well-trained. This highlights a significant importance of providing teachers with specialized training and experience with students with ASD. Training leads to greater senses of self-efficacy, yet there is a key dichotomy worth mentioning: the variety of individual manifestations of ASD is that there is no unique educational rule that applies to all children affected (Boujut, 2016). This adds to the ever-increasing importance of teachers being willing to seek out training and try new strategies with their students. This will, in turn, help to decrease frustration and increase motivation for both the students with ASD and the teachers.

Whether the focus is on educating students with ASD in United States, those in France, or in a different country altogether, research shows that specialized training, more in-depth preservice preparation, and teacher support programs are vital to the longevity of teachers working with students with Autism Spectrum Disorders and their perceived levels of both stress and success. Elise Pas et. al (2016) looked at a coaching model to assist teachers who work with

students with ASD, primarily focuses on managing behavior problems; their work focused on the eastern part of the United States. Emilie Boujut et. al (2016) explored the levels of stress, perceived social support, and burnout among teachers in France, as well as their reported coping strategies. In addition to professional development opportunities, a commonality between the two studies was the highlighted need for both an awareness of and a consistency with using evidence-based interventions and practices. This would help teachers to feel better prepared which would lead to the possibility of lower stress levels, which holds more benefit to both the teacher and the individual with ASD.

Student Engagement and Effective Teaching Practices.

Involving students in research, whether that means directly engaging them in interviews or using empirically-validated practices within instruction, adds an additional layer of data that can provide a more wholesome look into working with individuals with ASD. These approaches, instructional practices, and implications for future success and research progress have been explored across the globe (a trend that is continuously being seen among recent research regarding Autism Spectrum Disorders).

Working out of the University of Queensland (Australia), Harrington et. al (2013) conducted doctoral research that focused on students with ASD and their experiences in mainstream schooling. Their goal was to share strategies that engaged the students and their parents in the research process, as well as to reflect on the implications and responsibilities of carrying out these research approaches in the future. Nine families participated in the study (2 couples, 7 mothers) and it involved eight adolescents (ages 12-15). This study was conducted prior to the DSM V, which placed all autistic-type disorders under one diagnostic reference, so

the participants were identified using the proper terminology of the time: three of them were diagnosed with PDD-NOS, and 5 with Asperger's.

In this qualitative study, in-depth, semi-structured interviews were conducted with the parents and the adolescents in their own homes (in order to provide a more comfortable setting). Parents were interviewed twice, for about 1.5-3.5 hours per session. These interviews focused on establishing a timeline of mainstream schooling experiences along with significant events or barriers, and then exploring those events and/or barriers more extensively. The adolescents were interviewed separately (7 of the 8 declined to have their parent present) and were asked to share their own perspectives and experiences with school. Unlike the parent interviews, these interviews lasted 30-70 minutes and were only conducted once.

Harrington's study focused on the strategies used during the interviews to engage the adolescents in the research. Some of these strategies included building rapport and getting to know the participants, using an adapted Social Story™ to explain the interview process, and choosing a comfortable environment. The participants were also presented with a visual/written schedule to sequence the events of the interview. An important focus of the research was to show that diagnostic-related assumptions about impairments can lead researchers to develop strategies which exclude or restrict rather than maximize participation of people in research (Harrington, 2013). Enabling young people with ASD to provide rich and meaningful insights requires creative and flexible planning, as well as an acknowledgement of the unique dynamics each individual brings to the process.

The study found that engaging adolescents with ASD in research takes careful and extensive preparation. Questions have to be formulated and presented in a way that the adolescents are capable of answering, which may mean adapting the wording or delivery

method. Using more closed and yes/no questions and fewer open-ended questions was viewed to be easier for engaging the individuals with ASD in the interviews. Referencing basic emotions as opposed to complex emotions was also seen to be more effective during the research protocol. Being able to understand how characteristics of ASD might impact the process is also vital. Once these factors are accounted for, however, their experiences lend a key perspective that often lacks in research regarding ASD. An implication for future research is to consider engaging the participants in multiple interviews; this might help them to feel more comfortable with the interviewer and the process, leading to an opportunity to explore the participant's experiences in greater depth.

In the Pacific Northwest region of the United States, Tiffany Kodak and a team of researchers sought out to gain information about empirically-based practices, specifically in the area of receptive identification. They inquired about special education teachers' selection and use of behavior-analytic interventions to teach receptive identification to students with ASD (Kodak et. al, 2018). Teachers from 31 school districts in a state in the Pacific Northwest were included in the study. Of the 110 surveys that were sent out to special education teachers, 64 were completed entirely; 99% of the respondents met the inclusion criteria by indicating that they currently or previously worked with a student with ASD and taught receptive identification skills. About 80% the respondents reported using trial-based instruction methods (breaking down skills into smaller steps and teaching them to mastery) to teach these receptive identification skills.

Receptive identification, also known as audio-visual conditional discrimination, is typically used in comprehensive intervention services and school-based settings. Students are given receptive identification tasks and then receive immediate feedback. Examples of these

receptive identification tasks include: placing an item in a specific location; pointing to a food item or shape; and touching coins when given a coin name. The child is provided necessary materials, and then is given a prompt or task to perform. If the child is correct, positive reinforcement is given. For the data in the study, this positive reinforcement usually came in the form of praise and time with a favored object.

Information from the survey feedback (completed by the special education teachers) indicated that there were three most common reasons for selecting a specific teaching procedure or strategy to use in the classroom. Using the strategy in the past with another student was a frequently reported reason. Another reason for selecting a strategy was that teachers had received formal training on how to implement it. In addition, teachers also explained that they chose a strategy because it was part of the curriculum that was selected and used by the class, school, or district. Some of the teachers volunteered to participate in an observation of their implementation of selected practices in their classroom. Each observation occurred on one day of the week for 2 to 3 hours, and the experimenters were able to collect data during approximately 15 trials of instruction per participant (Kodak, 2018).

When discussing the efficacy of these strategies and teaching practices selected by teachers, empirically-validated practices were frequently rated as more effective than nonempirically-validated ones. However, it is interesting to note that the researchers found that participant implementation of trial-based instruction in the classroom was not as consistent as the implementation of trial-based instruction that had been reported in the literature (previous studies and survey data). This finding, along with the results of the classroom observations, suggests a greater need for training and monitoring the intervention integrity within school settings. Kodak et. al (2018) noted that behavior analysts must advocate for ways to provide training to teachers

and staff so that novel, evidence-based interventions are more likely to be selected than familiar (and possibly less effective) interventions. Identifying the best route to take in improving the efficacy of services and interventions provided to those with ASD involves further investigation of the research-to-practice gap when it comes to both the selection and implementation of interventions.

Involving students in research, whether that means directly engaging them in interviews or using empirically-validated practices within instruction, adds an additional layer of data that can provide a more wholesome look into working with individuals with ASD. These approaches, instructional practices, and implications for future success and research progress have been explored across the globe (a trend that is continuously being seen among recent research regarding Autism Spectrum Disorders).

Empirically-validated strategies and teaching practices has been rated more effective than nonempirically-validated strategies by special education teachers. This practice involves teachers and their students in the continuous research process. Kodak et. al (2018) explored this notion by administering surveys and conducting classroom observations regarding the selection and use of behavior-analytic interventions to teach receptive identification to students with ASD. Harrington et. al (2013) also examined involving students in the research process by focusing on strategies to engage students with ASD and their parents directly. They were invited to participate in semi-structured interviews and were encouraged to speak freely about their experiences. Harrington (2013) focused on strategies to keep the students interested and on topic, including building rapport, using an adapted Social Story, conducting interviews in a comfortable environment, and using a visual/written schedule. Kodak's study (2018) concluded that further investigation into the research-to-practice gap regarding strategies and interventions

for working with individuals with ASD is necessary in order to improve their levels of efficacy. Similarly, Harrington (2013) noted that creative and flexible planning, as well as an understanding of the unique dynamics of ASD, is necessary for enabling individuals with ASD to contribute valuable insights. Both teams of researchers found that understanding ASD is a vital component for successfully gaining information and finding effective strategies to implement. Once this foundation has been established, further techniques can be utilized and additional research can flourish.

Conclusion

This literature review has examined research from within the past decade that examines about strategies and experiences associated with working with individuals with ASD. The research was disaggregated into four broad categories: academic interventions, behavioral/social supports, student perceptions, and teacher-focused studies. Global perspectives were considered, looking at studies conducted in the United States, Australia, France, and Sweden. Future research regarding Autism Spectrum Disorders should include countries and areas of the world not incorporated into this literature review. Qualitative, quantitative, and mixed research approaches were included to provide a well-rounded set of perspectives and data on this topic.

A few implications are common across all the research presented. First, modeling and guided practice along with continuous feedback and prompting supports appears to help students make more meaningful connections with the instructional material presented to them and take a more active role in the education process (Whalon, 2013; Howorth, 2016). Second, semi-structured play activities can have therapeutic benefits for development and social inclusion with students who have ASD (Wolfberg, 2015). Third, consistency and predictability are highly valued by individuals with ASD. Schedules, transition behavior instruction and plans, and

sensory-based interventions can increase the likelihood of student success (Wolfberg, 2015; Lequia, 2015; Mills, 2018). Finally, working with others (especially in support-based situations like coaching) received positive feedback and was perceived to be highly beneficial (Sehlin, 2018; Trembath, 2012). The biggest key to remember in all these implications, however, is that the experiences, interests, and preferred strategies have been found to be noticeably individualized. This should be kept in mind when looking for interventions to implement or when carrying out future research.

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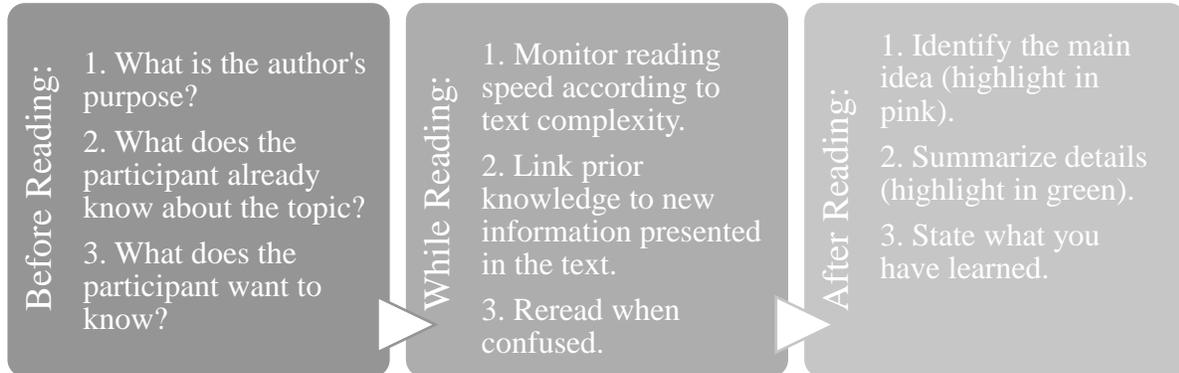
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Appendix A

TWA Questions and Prompts



Students were given these prompts during the intervention phase. The TWA strategy was used to help students increase their reading comprehension skills.

Adapted from “Effects of the TWA Strategy on Expository Reading Comprehension of Students with Autism” by S. Howorth, C. Lopata, M. Thomeer, and J. Rodgers, 2016, *British Journal of Special Education*, 43, p. 46.

Appendix B

Dialogic Reading Intervention Components

CROWD Prompts	Explanation
Completion	A blank is left at the end of a sentence for the child to fill in.
Recall	Questions about what happened (typically targeting plot or sequencing).
Open-ended	Asking the child to tell what is happening in the picture.
Wh-questions	Targeting vocabulary using pictures in the book.
Distancing	Questions aimed at helping the child relate information from the book to their own experiences.
PEER Scaffolding Model	
Prompt the child to respond to the book (using a CROWD prompt)	
Evaluate the child’s response	
Expand the child’s response by restating the response and adding information	
Repeat the expansion (encourage the child to)	

These dialogic reading components served as the foundation for Whalon, Delano, and Hanline’s creation of the RECALL strategy.

Adapted from “A Rationale and Strategy for Adapting Dialogic Reading for Children with Autism Spectrum Disorder: RECALL” by K. Whalon, M. Delano, and M.F. Hanline, 2013, *Preventing School Failure*, 57, p. 95-98.

Appendix C

Symbolic and Social Play Domains

Play Behavior	Definition	Example
<i>Symbolic Play Domain</i>		
(1) Not engaged	Child does not touch objects or toys or act out roles in play. Child may enact self-regulatory behavior that does not involve play materials.	Child gazes at own hand; rocks body; waves or flaps arms and hands; glances at toys.
(2) Manipulation-sensory	Child explores and manipulates toys or objects, but does not use them in conventional ways. There is apparent motivation to obtain sensory input and exert control over physical world.	Child enacts play schemes that may include: simple actions with single objects; simple action sequences with combining objects; performs difficult feats with objects.
(3) Functional	Child demonstrates conventional use of an object or association of two or more objects.	Child enacts play schemes that may include: using object as intended; combining two or more related objects; following familiar routines with realistic props.
(4) Symbolic-pretend	Child acts as if doing something or being someone else with intent that is representational. Play scripts vary with increasing complexity and cohesion.	Child enacts play schemes that may include: object substitutions, using one object to represent another; attribution of absent or false properties; creating imaginary objects or events; role-playing scripts (real or invented) with dolls, self, peers, and/or imaginary characters.
<i>Social Play Domain</i>		
(1) Isolate	Child appears to be unaware of peers. May wander without looking at peers, occupy self by watching anything of momentary interest, play with own body or play alone.	Child lies on floor; gets on and off chair; sits quietly gazing into space; plays with back to peers.

(2) Onlooker-orientation	Child shows an awareness of peers by looking at them or in the direction of their play materials and activities. Child does not enter into play with peers.	Child quietly watches peers; turns body to face peers; peripherally gazes at peers; imitates peers while watching from a distance.
(3) Parallel-proximity	Child plays independently beside peers rather than with peers. This includes simultaneous use of the same play space that may involve use of similar play materials, acting in similar ways or imitating peers.	Child plays besides peers at a water table; brushes a doll's hair near a child pushing a doll carriage; makes crying sound beside peer who pretends to make a baby cry.
(4) Common focus	Child plays by interacting with one or more peers with shared attention on the play. This involves one or more reciprocal exchanges that may include joint attention, mutual imitation, sharing emotional expression, sharing materials, taking turns, giving and receiving assistance and directives.	Child and peer exchange blocks; engage in peek-a-boo; take turns brushing a doll's hair; pretend to talk to each other on telephone; talk and laugh with one another.
(5) Common goal	Child and peers cooperate in play by explicitly planning and carrying out a shared agenda. This involves defining rules and roles, negotiating, compromising, coordinating and supplementing one another's efforts.	Child and peer plan and build a block tower to a specified height; plan and act out a restaurant, each with an assigned role; plan in advance to take turns being first to play a game.

These symbolic and social domains were observed and studied during Wolfberg, DeWitt, Young, and Nguyen's use of the Integrated Play Groups model.

Adapted from "Integrated Play Groups: Promoting Symbolic Play and Social Engagement with Typical Peers in Children with ASD Across Settings" by P. Wolfberg, M. DeWitt, G.S. Young, and T. Nguyen, 2015, *Journal of Autism & Developmental Disorders*, 457, p. 837.

Appendix D

Variables Regarding Transition Behavior Interventions

Variable	Explanation/Example	Effect Size
<i>Main Intervention Component</i>		
Activity Schedules (AS)	Visual depictions of the sequence of activities for the day.	0.934 (strong)
Social Narratives (SN)	Includes Social Stories™ and power cards. They highlight behavioral expectations and cues for various social situations.	0.998 (strong)
Video Models (VM)	Videos showing either the student or a model (i.e. same-age peer) engaging in the desired behaviors for the specific transition.	0.964 (strong)
High-p Procedure (HP)	The individual is asked 2-3 high-probability questions (likely to answer or comply with), followed by a low-probability request (i.e. targeted transition).	0.678 (moderate)
Reinforcement-based Procedures (RF)	Focuses on providing a reinforcer following displays of appropriate transition behaviors.	0.987 (strong)
Peer Mediation (PM)	A buddy system (typically developing peer and student with ASD) to facilitate proper transition behaviors.	0.932 (strong)
<i>Behavioral Topography</i>		
Aggression	One or more behaviors with the potential to cause harm to self or others (i.e. pushing, destruction, scratching, hitting, biting).	0.905 (moderate)
Off-Task	Requiring prompts by an adult to complete a transition.	0.943 (strong)
Inappropriate Vocalizations	Verbal utterances deemed unacceptable due to the topic or the volume of the utterance.	1.0 (strong)
Dropping to the Floor	Physically falling to the floor or sitting on the floor when asked to transition.	0.967 (strong)

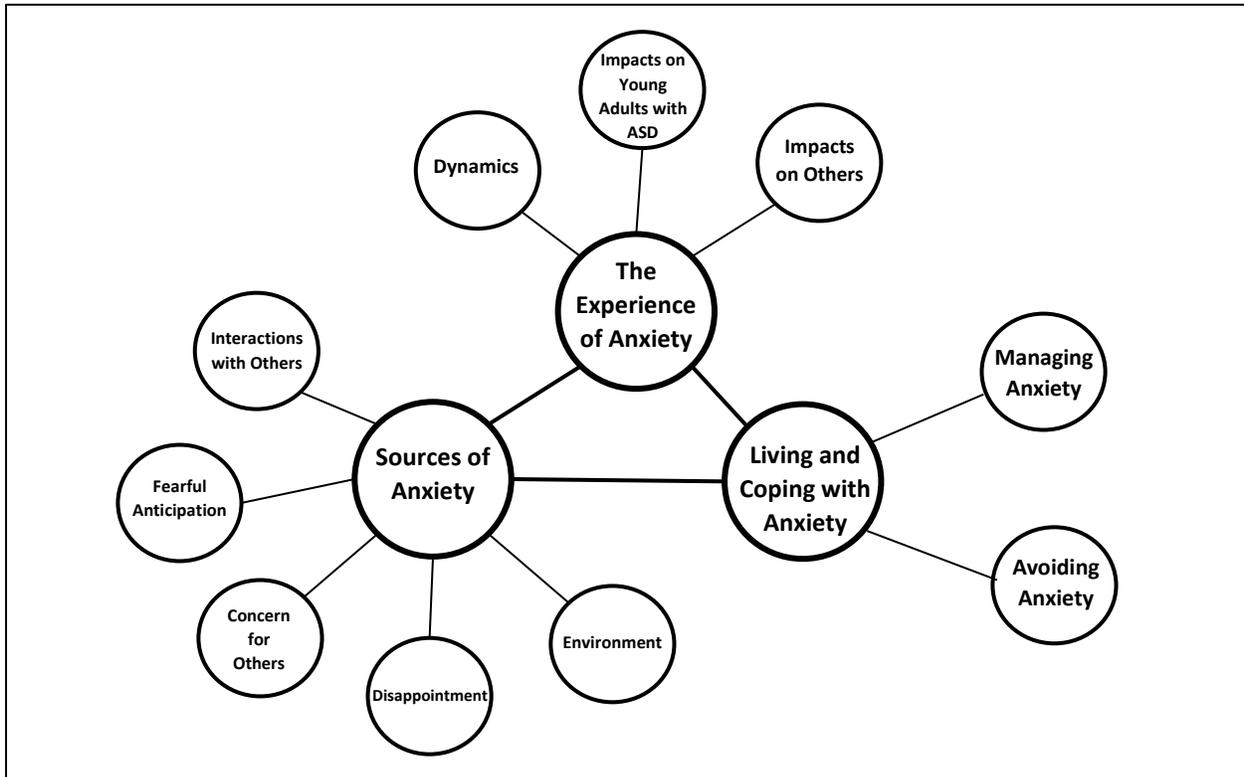
Elopement	Running away from the group during transitions.	0.964 (strong)
<i>Transition Types</i>		
Across Classroom	Ending an activity in one classroom to move to another classroom or location outside of the classroom.	0.990 (strong)
Within Classroom	Ending an activity and moving to another activity in the same classroom.	0.940 (strong)
Entering or Exiting the School	Transitions that required entering or exiting the school building.	0.853 (moderate)

These categories and variables were used to organize and evaluate the effectiveness of the transition behavior interventions in the studies included in the comprehensive evaluation conducted by Lequia, Wilkerson, Kim, and Lyons.

Adapted from “Improving Transition Behaviors in Students with Autism Spectrum Disorders: A Comprehensive Evaluation of Interventions in Educational Settings” by J. Lequia, K.L. Wilkerson, S. Kim, and G.L. Lyons, 2015, *Journal of Positive Behavior Interventions*, 17, p. 147-148.

Appendix E

Thematic Map of Anxiety Experiences



An analysis of the data gathered during Trembath, Germano, Johanson, and Dissanayake’s (2012) focus groups found a total of 10 subthemes for the 3 themes that were explored regarding anxiety in individuals with ASD.

Thematic map taken from “The Experience of Anxiety in Young Adults with Autism Spectrum Disorders” by D. Trembath, C. Germano, G. Johanson, and C. Dissanayake, 2012, *Focus on Autism & Other Developmental Disabilities*, 27(4), p. 216.