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Addressing Autism Spectrum Disorder In A School Based Setting

Grant Baker

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ADDRESSING AUTISM SPECTRUM DISORDER IN A SCHOOL BASED SETTING

by

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Approval Page

This scholarly project, submitted by Grant Baker in partial fulfillment of the requirement for the Degree of Occupational Therapy Doctorate from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

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Title: Addressing Autism Spectrum Disorder in a School Based Setting

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Grant Baker   4/7/2022

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ABSTRACT

Autism spectrum disorder (ASD) is a developmental disability that is currently estimated to be diagnosed in 1 in every 59 children (Baio et al., 2018). It has been established that it is important for individuals with a diagnosis of ASD to receive occupational therapy services (McGuire et al., 2015). Due to the high prevalence of an ASD diagnosis and the importance of occupational therapy services for children with this diagnosis there is a need for occupational therapy practitioners in all settings that work with these children to be competent in evidence-based approaches. Currently, students with ASD are receiving occupational therapy services within the school setting with most of these services being provided through a Multi-Tiered System of Support (MTSS; Clark, 2018). Due to these tiers these students are receiving these services both through direct and indirect interventions. This is because school-based occupational therapists are well equipped to offer both direct interventions to students and indirection interventions such as support to teachers working with children with different diagnosis due to their understanding of the factors that inhibit the child from being able to participate in school tasks (Hui et al., 2016). However, there are very few guidelines or resources available for how to best provide interventions across all three tiers of MTSS.

Due to the lack of guidelines or resources for providing interventions across all three tiers of MTSS there is a need for how to best implement interventions across all three tiers of MTSS to increase occupational performance for students with a diagnosis of ASD. The purpose of this project is to assist occupational therapy practitioners and school professionals to facilitate

increased occupational performance for children with ASD within the school setting. A literature review was completed and utilized to collaborate with an agency to determine a need to address best practices for the ASD population in schools. The information gathered in the literature review and constructs from the Person Environment Occupation (PEO) model (Law et al., 1996) were utilized in the development of the product.

The product consists of 6 tables and 3 case studies as well as a multitude of manualized and originally developed interventions. Table 1 consists of assessments found in the literature that are commonly used for students with ASD and the tier that they are most often implemented at. Table 1 also organizes these assessments by the construct of PEO that they most evaluate. Tables 2, 3, and 4 provide an outline for how to complete an occupational performance evaluation of a student with ASD. Table 5 provides examples of how to utilize information gathered during the occupational performance evaluation and how to translate that into a PEO transaction (Law et al., 1996) and how to use that transaction to select an intervention from Table 6.

Although increasing occupational performance for students with ASD within the school setting was the purpose of this product, there were some limitations. The first being the author of this product also has limited clinical experience working with this population, which may impact credibility or the ability for the tables and product to be properly disseminated. This product also only addresses the role of occupational therapy practitioners within the school setting and not the large number of other professionals that work with these same students. Lastly, a limitation of the product is that due to the complex and unique needs of each student with ASD specific interventions were unable to be included. Instead, tips and strategies for a multitude of

interventions and methods of implementing interventions at all three tiers of MTSS were created

and provided so that the occupational therapy practitioner can utilize their clinical reasoning to

apply those intervention principles to that student's individual situation. It is hoped that this

product can be implemented within the school system to expand the use of evidence-based

interventions across all three tiers of MTSS to increase occupational performance for students

with ASD.

Chapter I

Introduction

Autism Spectrum Disorder (ASD) is a disorder that affects 1 in every 59 children within the United States (Baio et al, 2018). Due to the high prevalence of ASD it has been established that it is important for individuals with a diagnosis of ASD to receive occupational therapy services (McGuire et al., 2015). A diagnosis of ASD is currently defined as having two distinct features. These features are "persistent deficits in social communication and social interactions across multiple contexts" and "restricted, repetitive, patterns of behavior, interests, or activities" (American Psychiatric Association, 2013). These deficits and social skills and restrictive and repetitive behaviors negatively impact a child's occupational performance in the school setting (Clark, 2018). Due to 1 in every 59 children within the United States being diagnosed with ASD (Baio et al., 2018), it is important that school-based occupational therapy practitioners are well-prepared to deliver evidence-based interventions to children with this diagnosis. By providing these services occupational therapists area able to target those deficits in social skills and those behaviors to facilitate increased occupational performance for children with an ASD diagnosis.

Due to the high prevalence of ASD and the benefits of occupational therapy services for children with this diagnosis, the purpose of this project was to complete a literature review and utilize that literature review to collaborate with an agency to

determine a need to address best practices for the ASD population in schools. There are two populations that this project targets. The first target being students who have a diagnosis of ASD. This population is targeted by this project as it outlines interventions that are viewed as best practice to assist these students. The second being the occupational therapy practitioners. This project targets occupational therapy practitioners by providing them with resources on best practice interventions for working with children with an ASD diagnosis in the school setting. With these resources it allows occupational therapy practitioners a tool to provide to teachers, paraprofessionals, and other staff members who frequently work with the students with an ASD diagnosis on a more frequent basis. By providing others with this foundational knowledge of different interventions these staff members will be able to implement the interventions more frequently with students with ASD which will lead to better outcomes in occupational performance for these students. These staff members will also have increased knowledge and skills as they will gain confidence and competence in these interventions and have a reference and guide for which interventions to provide when the occupational therapist, they work with is not readily accessible to provide coaching on the next step or the correct intervention to provide to the students. Since occupational therapy has been found to play a significant role in children with an ASD diagnosis lives' (McGuire et al., 2015). This product will further expand the role that occupational therapy can play for children with an ASD diagnosis.

Theoretical Framework

The theoretical framework that was implemented in the development of this project was the Person Environment Occupation (PEO) model (Law et al., 1996). The PEO model is a transactive model that is made up of three components which are the

Person, Environment, and Occupation (Law et al., 1996). The Person portion of this model can be interpreted as just the individual or also the family or support system around them (Strong & Rebeiro-Gruhl, 2018). In the development of this project the person was identified to be the students with an ASD diagnosis. The Environment portion of the PEO model is made up of the physical, cultural, institutional, social, and socio-economic environments (Law et al., 1996). All these portions of the environment are features within the school setting. With the most prominent being the institutional, social, and physical aspects of the environment. The Occupation portion of the model defines occupations as self-directed tasks and activities (Law et al., 1996). These tasks in this sense can include anything tasks that the student with an ASD diagnosis must or wants to perform at school. PEO is a transactive model which allows the user to look at the three components (Person, Environment, & Occupation), and how each of them influence one another and the impact that interaction has on occupational performance (Strong & Rebeiro-Gruhl, 2018). This transactive aspect of the model is a major reason it was selected to guide the development of this project as it is easily understood by other disciplines outside of the occupational therapy progression. This ease of understanding will lead to increased and more efficient use of the toolkit. The transactions that are discussed by PEO include PxE, PxO, and OxE with P being the person, E being the environment, and O being the occupations (Law et al. 1996). Not only were these transactions utilized in the development of the toolkit but they also had a strong influence in the literature review that was utilized as the foundation of this toolkit. Overall, the major impact of PEO on the final product is that is looks at how the transactions either negatively or positively impact occupational performance (Strong & Rebeiro-Gruhl,

2018). This was very beneficial in the development of the toolkit as the main goal of the toolkit is to increase the occupational performance of children with and ASD diagnosis within the school setting.

Key Terms

- **Special Education:** Educational services provided to students with special needs outside of general education (Cahill & Bazyk, 2020).

- **Multi-Tiered Systems of Support (MTSS):** A model of providing services made up of three tiers. Tier 1 (Universal or core instruction), Tier 2 (targeted intervention), and Tier 3 (intensive intervention). Tier 1 is viewed as early identification and screening, Tier 2 are targeted interventions for at risk students, and tier 3 are intensive individual interventions (Cahill & Bazyk, 2020).

- **Autism Spectrum Disorder (ASD):** A developmental disability defined by "persistent deficits in social communication and social interactions across multiple contexts" and "restricted, repetitive, patterns of behavior, interests, or activities" (American Psychiatric Association, 2013).

The focus of this project will be discussed further in detail in the following chapters. Chapter II is a comprehensive literature review that explores both areas of difficulty for children with ASD and best practice interventions to target those areas. Chapter III will describe the methodology used to design the toolkit of best practice interventions for children with ASD. Chapter IV will present the product that was created. Chapter V summarizes best practice interventions in the school setting for children with ASD. Chapter V also provides limitations of this project and recommendations for future research.

Chapter II

Literature Review

In the gathering of the literature, the Person Environment Occupation (PEO) model (Law et al., 1996) was implemented to create search terms and inclusion and exclusion criteria for sources. The PEO model is a model based on the idea that the interaction of three elements either positively or negatively impacts occupational performance (Law et al., 1996). These three elements are the Person (P), Environment (E), and Occupation (O) (Law et al., 1996). The person is defined as being made up of the person's traits physically, cognitively, sensory, and affectively (Law et al., 1996). In this literature review, the person has been identified as a student with a diagnosis of Autism Spectrum Disorder (ASD). A diagnosis of ASD is currently defined as having two distinct features. These features are "persistent deficits in social communication and social interactions across multiple contexts" and "restricted, repetitive, patterns of behavior, interests, or activities" (American Psychiatric Association, 2013). The Environment is defined as being made up of the physical, cultural, institutional, social, and socio-economic environments (Law et al., 1996). In this literature review, the environment is the school setting and these characteristics within it. The occupation is defined as a group of tasks that are completed to reach a certain result (Law et al., 1996). Within this literature review the occupation is being a student and all the tasks that make up being one. The interactions between the three elements are referred to as transactions

and are as follows "PxE", PxO", and "OxE" (Law et al., 1996). The model believes that the three transactions increase or decrease overall occupational performance (Law et al., 1996). In order to determine the effects on occupational performance, this literature review implemented these transactions when searching to decipher information and to determine the impact of the transactions on children with and ASD diagnosis' occupational performance.

Person and Occupation

There are many areas that students with a diagnosis of ASD experience many challenges. Areas of occupations that students with ASD must complete within the school setting that have been cited in the literature include Education, Social Participation, Play and Leisure, and Activities of Daily Living (Cahill & Bazyk, 2020). Person factors that influence these occupations include a variety of things. The first being children with an ASD diagnosis having difficulty with having the skills to appropriately participate socially with their peers (Alexander & Kunaeck, 2015; Dean & Chang, 2021; Njelsani & Samaan, 2021; Tanner et al., 2015). Due to the lack of skills with social participation, Njelsani and Samaan (2021) found that children with a diagnosis of ASD are more susceptible to bullying by their peers. Due to the difficulties with sensory processing that children with an ASD diagnosis frequently have challenges with developing the skills of inhibitory control, auditory sustained attention, and short-term verbal memory which are all skills needed to be successful within the school setting (Pastor-Cerezuela et al., 2020). Another area of challenge that was found for students with an ASD diagnosis is difficulty with motor planning and due to this, children with ASD frequently are delayed in the development of motor skills needed to participate in the school setting. (Ruggeri et al.,

2019). Another article which was written by Ambrose et al. (2020) identified that children with an ASD diagnosis had difficulty developing the skills of executive functioning and joint attention. This article found that by developing an intervention plan analyzing the interaction between the person, their environment, and the occupations they participate in they could positively impact the student's ability to implement joint attention (Ambrose et al., 2020). The evidence has also found that children with an ASD diagnosis often have challenges with engagement and attention, friendship and peer interaction, managing emotions and behavior, routines, and executive function skills (Alexander & Kuhaneck, 2015). Alexander and Kuhaneck (2015) found that these skills were common challenges for children with an ASD diagnosis that school staff members could help provide interventions for to increase the occupational performance of these children within the school setting.

Children with ASD also have areas of occupations that they are also commonly successful with and foundational skills that benefit them in the educational setting. These areas can be used in interventions plans by occupational therapy practitioners to build on skills that children already have success with to base new skills off. These areas of strength vary between each person as they are usually engrained into the preferred tasks and occupation of each individual child (Ambrose et al., 2020). Although these preferred tasks may at times inhibit occupational performance, occupational therapy practitioners are also able to utilize them as motivation or building blocks to develop new skills or abilities for children with an ASD diagnosis (Clark, 2018).

Person and Environment

Another way that occupational therapy practitioners can address children with an ASD diagnosis is providing interventions indirectly through the environment. When viewing the environment through the lens of the PEO model it is made up of the physical, cultural, institutional, social, and socio-economic environments (Law et al., 1996). When looking at the environment for the purpose of this literature review, the environment as a whole is a school district which is made up of the physical buildings and classrooms within, the culture norms of the schools, the institutional policies of that school district and the laws they abide by, the social aspect being the people within the schools, and the socioeconomic environment being the funding required to operate the school district. In the school setting, the social environment is mostly made up of other students and staff members at the school. Among these staff members is the individualized education plan (IEP) team which consists of all of the staff members that work with to determine the student's eligibility for special education and planning a program for the student to increase occupational performance (Clark, 2018). It has also been found that the social environment can impact the child specifically at mealtime due to children with ASD at times having sensitivity to sounds, smells, tastes, or being touched (Clark, 2018). All these aspects of the environment interact with the student with a diagnosis of ASD to either improve or hinder their occupational performance.

The first major law that impacts children with a diagnosis of ASD at in the school setting is the Individuals with Disabilities Education Act (IDEA). IDEA is a "law that makes available a free appropriate public education to eligible children with disabilities throughout the nation and ensures special education and related services to those

children" (Individuals with Disabilities Education Act, 2004). This means that this law impacts children with a diagnosis of ASD by assuring them that they will be provided special education services within the school system. IDEA also guarantees that these services will be provided in the least restrictive environment (Clark, 2018). Another major law that impacts children with a diagnosis of ASD in the school setting is ESSA also known as the Every Student Succeeds Act (2015). According to the Every Student Succeeds Act (2015), states are required to measure performance in the subjects of math, reading, and science, create easy access to performance in those areas, improve transparency so that parents can make the best decisions on their child, and increases flexibility for the use of funds. The most applicable part of this law for students with a diagnosis of ASD is the flexibility in the use of funds. This is because it allows for the funds to be used for career and technical education (Every Student Succeeds Act, 2015) which are foundational pieces of the transition portion of special education. Another option to assist students with ASD that is a part of the environment is the implementation of a Section 504 plan (Section 504 of the Rehabilitation Act, 1978). A Section 504 plan is implemented when a student with a diagnosis of ASD does not seed instructional support but still needs modifications or accommodations to the environment (Section 504 of the Rehabilitation Act, 1978). Children with a diagnosis of ASD are also impacted by state laws. For example, the state of Nebraska has a law referred to as Rule 51. According to the Nebraska Department of Education (2022) Rule 51 is a law that sets the standards for all special education programs in the state of Nebraska. This law sets standards for things such as qualifications for special education services, Individualized Education Plans (IEP), identification standards, and reimbursement for services provided among many

other things (Nebraska Department of Education, 2022). Students with a diagnosis of ASD do qualify for special education services under rule 51 (Nebraska Department of Education, 2022), which is why it has such an impact on the education that they receive. Lastly Multi-Tiered System of Support (MTSS) is a policy that impacts children with an ASD diagnosis (Clark, 2018). MTSS is made possible by a combination of the previously discussed laws which are the IDEA and ESSA (Clark, 2018). MTSS is made up of three tiers where service is provided Tier 1 services frequently being served in the natural classroom with general education, Tier 2 services being provided to students who are considered at risk and Tier 3 being special education services where the student is pulled out of the general education learning environment (Clark, 2018). Since there are three different tiers where students with an ASD diagnosis can be provided special education services there are a variety of environments that impact the occupational performance for those students.

Occupation and Environment

It is also important to understand how the environment and the occupations impact one in another within the school setting. Specifically, to understand which occupations can be completed or need to be modified due to the environment. There are many occupations that are typically completed within the school setting. The first being activities of daily living which includes dressing, eating, toileting, and basic hygiene (Cahill & Bazyk, 2020). The next being education which includes classroom work, handwriting, and class participation (Grajo et al., 2020). The next being play which involves playing with peers at recess and in class games (Cahill & Bazyk, 2020). The last occupation being social participation which includes interacting with peers, teachers, and

other school staff members successfully (Cahill & Bazyk, 2020). To complete these occupations many skills are required of children with ASD. These skills include engagement and attention, friendship and peer interaction, managing emotions and behavior, routines, and executive function (Alexander & Kuhaneck, 2015). All these occupations and ability to develop these skills are influenced by how the environment can best support interventions in them. If the environment is supportive of participation in these occupations and development of these skills, then occupational performance will increase but if it is not supportive then these occupations will not be completed in the correct way and the skills will not be developed. The literature and the laws within the United States also have found that occupations in the school should be completed in the natural context in order to facilitate increased occupational performance for all students (Clark, 2018) This means that when looking back at the MTSS framework discussed earlier it would be beneficial for all students to receive services in Tier 1 before moving to Tier 2 and Tier 2 before moving to Tier 3 so that they are receiving these services in the most natural context.

Assessments

In order to determine the challenges listed above there are multiple assessments implemented by occupational therapy practitioners in the school setting that evaluate the occupational performance of children with ASD in a variety of different areas (Burns et al., 2020). The majority of these assessments are evaluation the "Person" portion of the PEO model. However, occupational therapy practitioners can informally evaluate both the context through skilled observation and the occupations that are completed in the school setting through activity analysis (Clark, 2018). Skilled observation of the

environment would involve the occupational therapy practitioner observing the environment and making notes of different context factors and their potential impacts. Activity analysis involves the occupational therapy practitioner breaking down the occupation into a step-by-step process to better understand the skills that are necessary to complete that occupation. The most commonly used assessments to assess the "Person" portion of PEO were outlined in an article by Burns et al. (2020). These assessments and a description about them are located in Table 1. Of these assessments Burns et al. (2020) found that the most often used assessment for children with ASD is the Sensory Profile (Dunn, 1999). A common theme among these assessments is that they majority of them look at sensory system of the child and how each individual reacts to different stimuli. Burns et al. (2020) also found that evidenced supports that children with an ASD diagnosis score much different on the sensory profile than typically developing children which further strengthens the idea stated previously that this is an area of challenge for children with ASD. The study by Burns et al. (2020) also found that children who had significant scores on the Sensory Profile (Dunn, 1999) had challenges with attention and focusing which were also challenges discussed previously. These challenges with attention and focus may be heightened in children with ASD experiencing sensory problems due to the restrictive and repetitive behaviors discussed previously that that they already display. All of these challenges impact the ability for the person to increase their occupational performance in their chosen or required occupations which is why it is imperative that occupational therapy practitioners identify them and provide targeted direct and indirect interventions to address them. Before implementing these assessments, it is most important that the occupational therapy practitioner complete an occupational

profile to gain an understanding of the student with a diagnosis of ASD's strengths and

challenges, routine, occupational and medical history, and special interest areas (Clark,

2018). This information along with the formal assessments above will provide useful

information for the occupational therapy practitioner in developing interventions that

increase occupational performance for that student.

Interventions

Effective interventions for children with an ASD diagnosis in the school setting

need to target the following transactions: P x E, P x O, and O x E. Ambrose et al. (2020)

found that a necessary step when developing interventions for children with a diagnosis

of ASD is to analyze the interaction of the Person, Environment, and Occupation and the

transactions between them listed above. Within the school setting children with a

diagnosis of ASD need to be able to complete the occupations of education, social

participation, play, and activities of daily living (Cahill & Bazyk, 2020). To complete

these occupations there are skills that the child with ASD must have. These skills include

executive functioning, motor performance, sensory processing, engagement and attention,

managing behaviors and emotions, following routines, social communication and peer

interaction, friendship, dressing, eating, toileting, basic hygiene, participation in games

within the classroom and participation in recess with peers (Cahill & Bazyk, 2020; Clark,

2018) Please see Table 2 below for a comprehensive list of interventions found in the

literature that target these skills in order to complete the occupations required within the

school setting. Many of the interventions in the literature target the person directly. The

first of these being interventions that target the social skills of the person. Dean and

Chang (2021) and Tanner et al. (2015) found that by developing social interventions that

target these skills the occupational performance in the area of social participation increased for students with an ASD diagnosis. Another area of challenge for students with ASD that was addressed within the literature was the motor ability of the student. When targeting this specific challenge for students with an ASD diagnosis it has been found that motor learning should be used as a base for the development of the intervention has shown to be the most successful (Ruggeri et al., 2019).

There have also been many interventions found in the literature that target the environment in order to assist children with a diagnosis of ASD. These interventions are best described by the term supports as they do not directly target the child but instead provide support indirectly that assists them. These interventions are important because it has been found that teachers and paraprofessionals who frequently work with children with an ASD diagnosis on a daily basis lack the necessary training to effectively provide intervention to and assist these children (Fontil et al., 2019; Leifler et al., 2020). By providing indirect service to the teachers and paraprofessionals, occupational therapy practitioners are improving the environmental supports for children with an ASD diagnosis in the school setting (Leifler et al., 2020). In an article by Grandisson et al. (2020), the authors outlined a model for paraprofessionals and teachers to implement with children with ASD in the school setting to better understand their needs which in turn helped them to better serve those children. Models such as this allow the children with ASD to be better understood which leads to better interventions and an increase in occupational performance. Occupational therapy practitioners are also able to provide services indirectly to supports in the child's environment by providing parental training on modifications they can make at home to set the student up for increased occupational

performance as student (Miller-Kuhaneck & Watling, 2018). These services for parental training are covered under IDEA which was discussed previously. (Miller-Kuhaneck & Watling, 2018). Due to the challenges with sensory processing discussed previously another intervention that has been found to be helpful for students with an ASD diagnosis is making environmental changes. Examples of environmental change interventions include changing visual aspects, auditory aspects, and balance/proprioception aspects. By doing this it has been found to positively impact educational performance of children with an ASD diagnosis (Dargue et al. 2021). An example of this was found that by providing visual instructions instead of verbal instructions it was more beneficial for teaching children with an ASD diagnosis (Ruggeri et al., 2019). In a chart developed by Alexander and Kuhaneck (2015), the authors outline different intervention strategies that can be implemented by teachers and staff members can implement to assist children with ASD increase their occupational performance in the school setting. In this chart, strategies that target changes in the environment include utilizing a visual timer, changing method of instruction, decreasing competing auditory input, providing alternative seating options, varying positioning in the classroom, and providing devices with apps and software to assist with completing schoolwork. By implementing these strategies in the classroom, the authors believe it will increase the occupational performance of children with an ASD diagnosis within the school setting.

Table 1

Assessments Commonly used with Children with ASD found in the Literature

Common Assessments for Children with ASD	
Assessment Title	**Purpose of Assessment**
Sensory Profile (Dunn, 1999)	The assessment is made up of 125 items that caregivers are asked to answer to describe responses to sensory stimuli. It is divided into three types of sensory stimuli which are: sensory processing, sensory modulation, and behavioral and emotional responses (Dunn, 1997).
Sensory Experiences Questionnaire (Baranek, 1999a)	The assessment is a 21-item questionnaire that is filled out a caregiver to measures the child's behavioral responses to sensory experiences (Baranek, 1999a).
Sensory Processing Assessment for Young Children (Baranek, 1999b)	The assessment is made up of observational, semi-structured, and play based portions. The purpose of this assessment is to identify patterns of sensory processing in children with a diagnosis of ASD or Development Disability. It has sections including approach/avoidance, orienting to unexpected sensory stimuli, habituation to repeated stimuli, and unusual sensory-seeking behaviors (Baranek, 1999b).
Sensory Processing Measure (Parham et al., 2021)	The assessment is based on a parent and/or teaching completing a rating scale evaluating the child's social participation, praxis, and sensory processing issues (Parham et al., 2021).
Sensory Processing Scale Assessment (Schoen et al., 2014)	The assessment measures sensory functioning using yes/no questions about behavioral responses in 7 sensory domains (Schoen et al., 2014).
Tactile Defensiveness and Discrimination Test Revised (Baranek, 2010)	The assessment utilizes structured behavioral observation of children completed play-based tactile tasks to determine tactile processing of children with ASD or developmental disability (Baranek, 2010).
The Infant Toddler Social Emotional Assessment (Carter & Briggs-Gowan, 2006)	The assessment utilizes parent report to determine social/emotional and behavioral problems in infants and toddlers. While doing this it addresses sensory issues the infants and toddler may have (Carter & Briggs-Gowan, 2006).
Japanese Sensory Inventory Revised (Ota, 2004)	The assessment utilizes caregiver report to determine behavioral responses to stimuli in 8 categories for children ages 4-6 years old (Ota, 2004).
Sensory Perception Quotient (Tavassoli, et al., 2014)	The assessment utilizes self-reporting on a questionnaire to adults with a diagnosis of ASD to determine hyper and hyposensitivity across different sensory aspects of their life (Tavassoli, et al., 2014).

Sensory Questionnaire (Boyd & Baranek, 2005)	The assessment utilizes a questionnaire to determine if children with ASD have in the last 3 months or prior to the previous 3 months but not now displayed difficulty with sensory processing (Boyd & Baranek, 2005).
Sensory Sensitivity Questionnaire (Minshew & Hobson, 2008)	The assessment utilizes both a self-report and parent report questionnaire to determine as sensory sensitivities the person may have (Minshew & Hobson, 2008).
Sensory Sensitivity Questionnaire Revised (Talay-Ongan & Wood, (2000)	The assessment utilizes caregiver report questionnaire of yes/no questions to determine if the child has sensory sensitivities in the areas of auditory, tactile, visual, gustatory, vestibular, and olfactory (Talay-Ongan & Wood, 2000).

Table 2

Interventions found in the literature for students with ASD

Effective Interventions to Facilitate Educational Performance	
Skill Targeted	**Interventions** *Some interventions are listed under more than one skill as they target multiple skills*
Executive Functioning	- Simplifying the social environment improves joint attention for children with ASD (Ambrose et al., 2020). - Facilitating planning and problem-solving using Co-OP approach (Dawson et al., 2017). - Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). - Exercise and Yoga may be effective interventions in improving success in education for children with ASD. (Weaver, 2015). "How does your engine run" targets improved executive functioning utilizing self-regulation and sensory strategies (Williams & Shellenberger, 1996).
Motor performance	- Utilizing motor learning as a foundation for developing interventions for children with ASD will assist in targeting motor skill difficulties for this population (Ruggeri et al., 2019). - Physical education teachers and occupational therapists should work together to modify class activities to overcome motor challenges for children with ASD (Clark, 2018).
Sensory Processing	Implementing sensory based interventions improves children with ASD's social participation (Clark, 2018).

	• Exercise and Yoga may be effective interventions in improving success in education for children with ASD (Weaver, 2015).
Engagement and Attention	• Exercise and Yoga may be effective interventions in improving success in education for children with ASD (Weaver, 2015). • Paraprofessional training can have a positive impact on educational performance for children with ASD (Leifler et al., 2020). • Environmental changes including changing visual aspects, auditory aspects, and balance/proprioception aspects can positively impact educational performance of children with an ASD diagnosis (Dargue et al. 2021). • Change visual aspects, auditory aspects, and balance/proprioception aspects of education (Dargue et al. 2020). • Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). • Exercise and Yoga may be effective interventions in improving success in education for children with ASD (Weaver, 2015).
Managing Emotions and Behaviors	• For targeting self-regulation implement the Co-Op model (Dawson et al., 2017), "How does your engine run" (Williams &Shelleneberger, 1996), or Zones of Regulation" (Kuypers, 2011). o Co-Op to target problem solving and strategies and self-regulation (Dawson et al., 2017). • Exercise and Yoga may be effective interventions in improving success in education for children with ASD (Weaver, 2015). • Facilitating problem-solving using Co-OP approach (Dawson et al., 2017).
Routines	• Providing visual instructions instead of verbal instructions is more beneficial for teaching children with ASD. (Ruggeri et al., 2019). • Paraprofessional training on ASD and how to work with children with this diagnosis can have a positive impact on educational performance for children with ASD (Leifler et al., 2020). • Facilitating planning and problem-solving using Co-OP approach (Dawson et al., 2017).
Effective Interventions to Facilitate Social Participation	
Social Communication and Peer Interaction	• Social interventions provided in inclusive school settings to children with ASD were found to be most effective (Dean & Chang, 2021). • Implementing sensory based interventions improves children with ASD's social participation (Clark, 2018). • Activity based interventions which involve students working on tasks as a group improve social skills for children with ASD (Tomcheck & Koenig, 2016).

Friendship	• Incorporating typically developing children in social skills interventions for children with ASD in the school setting results in positive outcomes with both friendship building skills and social skills (Dean & Chang, 2021).
Effective Interventions to Facilitate Activities of Daily Living	
Dressing	• Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). • Utilizing motor learning as a foundation for developing interventions for children with ASD will assist in targeting motor skill difficulties for this population (Ruggeri et al., 2019). • Utilize a chaining approach to learning steps (Cahill & Bazyk, 2020).
Eating	• Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). • Utilizing motor learning as a foundation for developing interventions for children with ASD will assist in targeting motor skill difficulties for this population (Ruggeri et al., 2019).
Toileting	• Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). • Utilizing motor learning as a foundation for developing interventions for children with ASD will assist in targeting motor skill difficulties for this population (Ruggeri et al., 2019). • Utilize a chaining approach to learning steps (Cahill & Bazyk, 2020).
Basic Hygiene	• Provide visual instructions rather than verbal instructions (Ruggeri et al. 2019). • Utilizing motor learning as a foundation for developing interventions for children with ASD will assist in targeting motor skill difficulties for this population (Ruggeri et al., 2019). • Utilize a chaining approach to learning steps (Cahill & Bazyk, 2020).
Effective Interventions to Facilitate Play	
Participation in Games Within the Classroom	• Social interventions provided in inclusive school settings to children with ASD were found to be most effective (Dean & Chang, 2021). • Implementing sensory based interventions improves children with ASD's social participation (Clark, 2018).
Recess With Peers	• Social interventions provided in inclusive school settings to children with ASD were found to be most effective (Dean & Chang, 2021). • Incorporating typically developing children in social skills interventions for children with ASD in the school setting results in positive outcomes with both friendship building skills and social skills (Dean & Chang, 2021).

Chapter III

Methodology

Chapter III Methodology outlines the process that utilized to evaluate the literature on occupational therapy services for children with ASD in the school setting, defines the theory that was used to inform the product, and then describes the process of how the product was developed. The author was inspired by their interest in school-based occupational therapy services and their interest in children with a diagnosis of ASD based on their life experiences with children with this diagnosis. The high prevalence of this diagnosis in children in the United States resulted in the author wanting to gain knowledge on and develop a product on best practice interventions within the school setting for children with this diagnosis. Specifically, the author focused on interventions that occupational practitioners can provide to both the child with ASD directly and the school staff members that work with them daily to increase the occupational performance of these children.

To begin the literature review process, the author searched the current literature to determine best practice occupational therapy services for students with an ASD diagnosis, gain further understanding of the tiers of services in school-based occupational therapy and special education, and best practice sensory interventions that can be implemented in a school setting for children with an ASD diagnosis. The search terms "(autism) AND (pediatric OR child) AND (teacher OR paraprofessional OR school) AND (occupational therapy) AND (Best Practice)", "(autism) AND (School) AND

(Intervention OR evaluation) AND (Best Practice)", "(autism) AND (School) AND (Tiers OR Service Delivery) AND (Best Practice)", "Nebraska School Autism Funding and Laws", "(autism) AND (pediatric OR child) AND (intervention OR evaluation) AND (Best practice)", "(Health and Human Services) AND (Autism Spectrum Disorder)", and "(CDC) AND (Autism Spectrum Disorder)" were used to search the databases of Google Scholar, CINAHL, PubMed, and OT Search. In addition, the authors utilized the websites of the state of Nebraska Health and Human Services and the Center for Disease Control and Prevention (CDC) to locate literature and data needed. After conducting this literature review the author discovered that there was a need for better implementation of interventions for children with a diagnosis of ASD within the school setting. In addition, there was little specific research and recommendations on at which tier of Multi-Tiered Systems of Support (MTSS; Clark, 2018) that specific interventions should be implemented and how they should be implemented at each tier for students with a diagnosis of ASD.

Occupation Based Model

The author implemented the Person Environment Occupation (PEO) model (Law et al., 1996) in the development of search terms, determination of the need, and creation of the product. This model was developed by Law et al. (1996) to analyze how the three constructs in the model which are the person, environment, and occupation interact through transactions to positively or negatively impact occupational performance. This model was selected by the author due to its ease of understanding by other professionals that are not occupational therapy practitioners. To determine the search terms for the literature review the author developed questions based on the transactions of P x E, P x

O, and O x E (Law et al., 1996) By developing these questions based on the transactions the authors were able to target all aspects of the person, environment, and occupation and how they impact one another when searching the literature to determine a need. After completing this literature review the author was able to better understand that the interventions found in the literature target an overall combination of all the transactions which is P x E x O. This interaction of all three constructs of the model is what impacts overall occupational performance (Law et al., 1996). The author then used the interaction of those constructs to create a table to organize interventions by the individual occupations within the school setting that they target. The author was then able to expand on this table to inform the need when developing the product.

Product Selection Process

Prior to the development of the product, the author consulted both the findings in the literature and with an occupational therapist working within the school setting to determine a need. After completing this the author was able to determine a need for a toolkit that provides both guidelines on choosing interventions and how to apply them at each tier of MTSS for students with a diagnosis of ASD as there are no mentions of such toolkit in the literature or at the school district that this occupational therapist is employed. To effectively target this need the author created a table with a section for each of the occupations completed in the school setting. The author then split each section into individual rows for each skill that is needed to complete the stated occupation. These rows were split into two columns with one column being the skill targeted and the other being the interventions that have been found beneficial to increase occupational performance for the stated skills and occupations. The author then broke

these into two categories based on interventions that are manualized and able to be purchased and originally developed interventions based on the literature. Within these intervention sections the author outlined how each intervention can be provided at each of the three tiers of MTSS.

This Methodology section outlined the process and theories that guided the development of the toolkit to provide guidelines for occupational practitioners working with children with ASD within the school setting. The goal of this product is to provide interventions that occupational therapy practitioners can both directly and indirectly provide to students with ASD to facilitate increase occupational performance in the educational setting. Chapter IV is the Product, and it provides an introduction, the toolkit itself, an in-depth description, and instructions on how to best implement the finalized products

Chapter IV

Product

Chapter IV product provides a description of the product that is located in the Appendix. The product was constructed based on the findings in the literature review on best practice interventions for students with autism spectrum disorder (ASD) and Multi-Tiered Systems of Support (MTSS; Clark, 2018). The development of this product was guided by the Person Environment Occupation (PEO) model (Law et al., 1996). This model was chosen due to it being easily understood not only by occupational therapy practitioners who this product targets, but by other professionals as well. The product consists of 6 tables, 3 case studies, and a multitude of manualized and originally developed interventions that target the main occupations to participate in school.

Table 1 provides a description of commonly used assessments for students with ASD and what tier they are most used in. This table is broken down into the constructs of PEO (Law et al., 1996) which are the person, environment, and occupation and the assessments are placed into one or more of these categories depending on what they assess. Tables 2-4 are made up of the same table that is provide for occupational therapy practitioners to complete a full analysis of the person, environment, and occupation to determine what is impacting occupational performance. Table 2 specifically is a filled in table that provides examples under each section of the chart of what occupational therapy practitioners should be considering when completing an analysis in the school setting.

Table 3 provides an example on how to fill out the analysis table bases on the information provided in the tier 1 case study. Table 4 provides the same table as the previous two but blank. This table is meant to be used by occupational therapy practitioners to use on their own. If occupational therapy practitioners would like to trial this table, they are also able to fill it out for the tier 2 & 3 case Studies.

The product then moves from the analyzing to developing interventions based on the analysis. To do this the product outlines the use of the PEO model's transactions (Law et al., 1996). Table 5 provides an example of one transaction from each of the tier 1, 2, and 3 case studies. After breaking down each transaction it provides an intervention that could be chosen from Table 6 and how that intervention targets the person, environment, and the occupation to improve occupational performance. Table 6 was created based on the findings in the literature review. It is broken down into four occupations that were found to be completed most often within the school and the skills that are required to successfully complete those occupations. The occupations are educational performance, social participation, activities of daily living, and play. Within each skill there is at least one manualized and one originally developed intervention provided that can target that skill. It also provides a description of that intervention and how it can be applied at each tier of MTSS. Lastly, the originally developed interventions are located within the appendices of the product. These interventions range from handouts to a power point presentation that are designed to be easily disseminated and implemented by occupational therapy practitioners within the school setting.

Chapter V

Summary of Findings

Chapter V contains an overview of the product, implications of the product to occupational therapy practice, strengths and limitations of the product, and future recommendations. The purpose of this scholarly project was to create a product that increase occupational performance of student with a diagnosis of autism spectrum disorder (ASD) within the school setting. This product also aimed to provide occupational therapy practitioners an easy-to-use toolkit to allow them to facilitate increased occupational performance for those same students with ASD at all three tiers of Multi-Tiered Systems of Support (MTSS).

Overview of Product

The product *Addressing Autism Spectrum Disorder in a School Based Setting: A Toolkit for Occupational Therapy Practitioners,* provided a guide for occupational therapy practitioners on how to implement the Person Environment Occupation (PEO) model (Law et al., 1996) to analyze and then use that analysis to select both manualized and originally developed interventions to increase occupational performance for students with ASD within the school setting. For analysis it includes tables 3 and 4 which list assessments commonly used at tiers 1, 2, and 3 of MTSS and descriptions of each assessment. It also includes tables on how to analyze the person, environment, and occupation through lens of PEO in tables 5, 6, and 7. As well as case study examples for tiers 1, 2, and 3. For interventions the product includes instructions on how to use the

analysis to create accurate transactions and how to use those transactions to choose effective interventions. The product also includes manualized and originally developed interventions to target the occupations of educational performance, social participation, activities of daily living, and play in Table 8. Within Table 8 it breaks down each occupation by the skills that are needed to complete that occupation and interventions that target that specific skill. By utilizing both the analysis and the transactions to choose relevant interventions this product allows occupational therapy practitioners to efficiently and effectively increase occupational performance for students with an ASD diagnosis.

Implications for Occupational Therapy Practice

This product has many implications for occupational therapy practice. The first being that it simplifies the ability of occupational therapy practitioners in the school setting to increase occupational performance for students with a diagnosis of ASD. This product will also increase awareness of a multitude of interventions to occupational therapy practitioners that they may not be currently implementing. It may also solidify with occupational therapy practitioners that are currently utilizing some of these interventions that the current evidence still supports their use. This product also increases awareness of all the skills that are required to participate in the educational setting and will help occupational therapy practitioners to complete more thorough evaluations of children with ASD in the school setting. Lastly, this product provides occupational therapy practitioners with information on how to implement interventions across all three tiers of MTSS.

Strengths of the Product

This product targets occupational therapy practitioners as well as students with ASD and has a multitude of strengths that support increasing occupational performance for those students. First, this product aligns with current trends in public school systems which are transitioning from a Response to Intervention (RTI) approach to an MTSS approach or incorporating the foundations of RTI into their MTSS approach (Cahill & Bazyk, 2020). After consulting the literature there was not an explicit explanation of how interventions should be adapted to be completed at the three tiers of MTSS. The author of this product addressed that gap in the literature by creating this product that outlines how to adapt and implement interventions at all three tiers of MTSS. This product also was designed utilizing the Person Environment Occupation (PEO) model (Law et al., 1996), which is a model that is understood by other professionals besides occupational therapy practitioners. This makes it easier for occupational therapy practitioners to disseminate their process and reasoning behind determining interventions for students with ASD to other stakeholders within the school setting.

Overall, this product was created with much consideration of what the literature lists as best practice as well as ease of understanding for occupational therapy practitioners who provide school-based services to students with ASD. By doing this it provides occupational therapy practitioners the ability to feel confident that they are implementing evidence-based interventions correctly at all three tiers of MTSS. This product also utilizes the PEO model (Law et al., 1996) as a foundation which allows the occupational therapy practitioner to analyze and target all aspects of the person,

environment, and occupation when working with students with ASD to facilitate the desired occupational performance.

Limitations

While there are many strengths listed above there are also limitations to the product. Although the literature was thoroughly examined in the creation of this product the author has limited expertise and training in working with the population of students with ASD. The author of this product also has limited clinical experience working with this population. This may impact credibility or the ability for the tables and product to be properly disseminated. This product also only addresses the role of occupational therapy practitioners in providing school-based services to students with ASD. There are a variety of other professionals that work with these students that this product does not address, which limits the ability for those professionals to utilize it. Lastly, a limitation of the product is that due to the complex and unique needs of each student with ASD specific interventions were unable to be included. Instead, tips and strategies for a multitude of interventions and methods of implementing interventions at all three tiers of MTSS were created and provided so that the occupational therapy practitioner is able to utilize their clinical reasoning to apply those intervention principles to that student's individual situation.

Recommendations for Further Action

The author of this product intended to implement this product at a school district that the occupational therapist that was collaborated with in the determination of a need is employed. Opportunities for furth action for this product were determined throughout the development. This product could be expanded on to target more diagnosis than ASD as

children with ASD are only a portion of the students who receive special education services in public schools. This product could also be expanded on to be applicable to more professions than just occupational therapy. It is also recommended that research be conducted to determine the effectiveness of providing interventions adapted for each tier of MTSS.

Conclusion

In order for occupational therapy practitioners to provide best practice interventions to students with ASD in a school-based setting to increase occupational therapy performance they need to have a view of not only the person but also the environment and occupations as well. This product provides guidance so that occupational therapy practitioners can develop a wholistic view of all three constructs and how they impact one another through transactions. This product is unique as it provides practitioners with information on not only best practice interventions but also how these interventions can be implemented at all three tiers of MTSS. By doing this it will allow students with ASD in the school setting to increase their occupational performance. The author hopes that the development of this product assists both occupational therapy practitioners in providing services to students with ASD and facilitates successful participation at school for those very same students.

REFERENCES

Alexander, K. C., & Kuhaneck, H. M. (2015). *Successful participation at school: Strategies for students with autism spectrum disorder (ASD).* AOTA. https://www.aota.org/~/media/Corporate/Files/AboutOT/Professionals/WhatIsOT/CY/ASD-Tips-for-Educators-Successful-Participation-at-School.pdf

Ambrose, D., MacKenzie, D. E., & Parisa, G. (2020). The impact of person-environment-occupation transactions on joint attention in children with autism spectrum disorder: A scoping review. *British Journal of Occupational Therapy, 83*(6), 351-362. https://doi.org/10.1177/0308022620902681

American Psychiatric Association. (2013). Neurodevelopmental disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Baio, J., Wiggins, L., Christensen, D. L., Maenner, M. J., Daniels, J., Warren, Z., Kurzius-Spencer, M., Zahorodny, W., Robinson Rosenberg, C., White, T., Durkin, M. S., Imm, P., Nikolaou, L., Yeargin-Allsopp, M., Li-Ching, L., Harrington, R., Lopez, M., Fitzgerald, R. T., Hewitt, A., . . . Dowling, N. F. (2018). Prevalence of autism spectrum disorder among children aged 8 years-Autism and developmental disabilities monitoring network, 11 sites, United States, 2014. *Surveillance Summaries 67*(6), 1-23. http://dx.doi.org/10.15585/mmwr.ss6706a1external icon

Baranek, G. T. (1999a). *Sensory Experiences Questionnaire (SEQ) manual.* Chapel Hill, NC.

Baranek, G. T. (1999b). *Sensory Processing Assessment for Young Children (SPA) manual.* University of North Carolina.

Baranek, G. T. (2010). *Tactile Defensiveness and Discrimination Test– Revised (TDDT-R) manual.* Springer

Boyd, B. A., & Baranek, G. T. (2005). *Sensory Questionnaire (SQ) manual.* University of North Carolina.

Burns, C. O., Dixon, D. R., Novack, M., & Granpeesheh, D. (2017). A systematic review of assessments for sensory processing abnormalities in autism spectrum disorder. *Review Journal of Autism and Developmental Disorders, 4,* (209–224). https://doi.org/10.1007/s40489-017-0109-1

Cahill, S. M., & Bazyk, S. (2020). School-Based occupational therapy. In J. C. O'Brien & H. Kuhaneck (Eds.), *Case-Smith's occupational therapy for children and adolescents* (pp. 627-658). Elsevier Inc.

Carter, A. S., & Briggs-Gowan, M. J. (2006). *ITSEA: Infant-Toddler Social and Emotional Assessment examiner's manual*. PsychCorp.

Clark, G. F. (2018). Participation in school for students with ASD. In R. Watling & S. L. Spitzer (Eds.), *Autism across the lifespan A comprehensive occupational therapy approach* (pp. 389-403). The American Occupational Therapy Association.

Dargue, N., Adams, D., & Simpson, K. (2021). Can characteristics of the physical environment impact engagement in learning activities in children with autism? A

systematic review. *Review journal of autism and developmental disorders*.

https://doi.org/10.1007/s40489-021-00248-9

Dawson, D. R., McEwen, S., Polatajko, H., (Eds.). (2017). *Cognitive orientation to daily*

occupational performance: Using the CO-OP™ approach to enable participation

across the lifespan. AOTA Press.

Dean, M. & Chang, Y. (2021). A systematic review of school-based social skills

interventions and observed social outcomes for students with autism spectrum

disorder in inclusive settings. *Autism,* 1-16.

https://doi.org/10.1177/13623613211012886

Dunn, W. (1999). *Sensory Profile: User's manual.* Psychological Corporation.

Every Student Succeeds Act, 20 U.S.C. § 6301

(2015). https://www.congress.gov/bill/114th-congress/senate-bill/1177

Fontil, L., Gittens, J., Beaudoin, E., & Sladeczek, I. E. (2019). Barriers to and facilitators

of successful early school transitions for children with autism spectrum disorders

and other developmental disabilities: A systematic review. *Journal of Autism and*

Developmental Disorders, 50, 1866-1881. https://doi.org/10.1007/s10803-019-

03938-w

Grajo, L. C., Candler, C., & Sarafian, A. (2020). Interventions within the scope of

occupational therapy to improve children's academic participation: A systematic

review. *American Journal of Occupational Therapy, 74.*

https://doi.org/10.5014/ajot.2020.039016

Grandisson, M., Rajotte, E., Godin, J., Chrétien-Vincent, M., Milot, E., & Desmarais, C.

    (2020). Autism spectrum disorder: How can occupational therapists support

    schools? *Canadian Journal of Occupational Therapy, 87*(1), 31-41.

    https://doi.org/10.1177/0008417419838904

Hui, C., Snider, L., & Couture, M. (2016). Self-regulation workshop and occupational

    performance coaching with teachers: A pilot study. *Canadian Journal of*

    Occupational Therapy, 83, 115–125. https://doi.org/10.1177/0008417415627665

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004)

Kuypers, L. M. (2011). *The Zones of Regulation®: A curriculum designed to foster self-*

    regulation and emotional control. Think Social Publishing.

Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person-

    environment-occupation model: A transactive approach to occupational

    performance. *Canadian Journal of Occupational Therapy, 63(1),* 9-23.

    https://doi.org/10.1177/000841749606300103

Leifler, E., Carpelan, G., Zakrevska, A., Bolte, S., & Jonsson, O. (2020). Does the

    learning environment "make the grade"? A systematic review of accommodations

    for children on the autism spectrum in mainstream school. *Scandinavian Journal of*

    Occupational Therapy. https://doi.org/10.1080/11038128.2020.1832145

McGuire, K., Erickson, C., Gabriels, R. L., Kaplan, D., Mazefsky, C., McGonigle, J.,

    Meservy, J., Pedapati, E., Pierri, J., Wink, L., & Siegel, M. (2015). Psychiatric

hospitalization of children with autism or intellectual disability: Consensus statements on best practices. *Journal of the American Academy of Child and Adolescent Psychiatry 54,* 969-971. https://doi.org/10.1016/j.jaac.2015.08.017

Miller-Kuhaneck, H., & Watling, R. (2018). Parental or teacher education and coaching to support function and participation of children and youth with sensory processing and sensory integration challenges: A systematic review. *American Journal of Occupational Therapy, 72.* https://doi.org/10.5014/ajot.2018.029017

Minshew, N. J., & Hobson, J. A. (2008). Sensory sensitivities and performance on sensory perceptual tasks in high-functioning individuals with autism. *Journal of Autism and Developmental Disorders, 38(8),* 1485–1498. doi:10.1007/s10803-007-0528-4.

Nebraska Department of Education. (2022). *Regulations/Policies.* Special education. https://www.education.ne.gov/sped/regulationspolicies/

Njelesani, J., & Samaan, C. M. (2021). Antibullying interventions for autistics: A systematic review. *American Journal of Occupational Therapy.* DOI: 10.5014/ajot.2021.75S2-RP364

Ota, A. (2004). Reliability study of the Japanese Sensory Inventory Revised (JSI-R). Japanese *Journal of Sensory Integration Dysfunction, 10*, 49–54.

Parham, L. D., Ecker, C. L., Kuhaneck, H., Henry, D. A., & Glennon T. J. (2021). *Sensory processing measure (SPM-2).* Western Psychological Services.

Pastor-Cerezuela, G., Fernández-Andrés, M.-I., Sanz-Cervera, P., & Marín-Suelves, D.

 (2020). The impact of sensory processing on executive and cognitive functions in

 children with autism spectrum disorder in the school context. *Research in*

 Developmental Disabilities, *96*. https://doi.org/10.1016/j.ridd.2019.103540

Ruggeri, A., Dancel, A., Johnson, R., & Sargent, B. (2019). The effect of motor and

 physical activity intervention on motor outcomes of children with autism

 spectrum disorder: A systematic review. *Autism*, *24*(3), 544–568.

 https://doi.org/10.1177/1362361319885215

Schoen, S. A., Miller, L. J., & Sullivan, J. C. (2014). Measurement in sensory

 modulation: the Sensory Processing Scale Assessment. *The American Journal of*

 Occupational Therapy, 68(5), 522–530. doi: 10.5014/ajot.2014.012377.

Section 504 of the Rehabilitation Act, as amended, 29 U.S.C. 794 (1978).

Talay-Ongan, A., & Wood, K. (2000). Unusual sensory sensitivities in autism: A possible

 crossroads. *International Journal of Disability, Development and Education,*

 47(2), 201–212. doi:10.1080/ 713671112

Tanner, K., Hand, B. N., O'Toole, G., & Lane, A. E. (2015). Effectiveness of

 interventions to improve social participation, play, leisure, and restricted and

 repetitive behaviors in people with autism spectrum disorder: A systematic

 review. *The American Journal of Occupational Therapy, 69.*

 http://dx.doi.org/10.5014/ajot.2015.017806

Tavassoli, T., Hoekstra, R. A., & Baron-Cohen, S. (2014). The Sensory Perception

 Quotient (SPQ): Development and validation of a new sensory questionnaire for

adults with and without autism. *Molecular Autism, 5(29),* 1–10. doi:10.1186/2040-2392-5-29.

Tomchek, S., & Koenig, K. P. (2016). *Occupational therapy practice guidelines for individuals with autism spectrum disorder.* AOTA Press

Weaver, L. L. (2015). Effectiveness of work, activities of daily living, education, and sleep interventions for people with autism spectrum disorder: A systematic review. *American Journal of Occupational Therapy, 69.* http://dx.doi.org/10.5014/ajot.2015.017962

Williams, M., & Shellenberger, S. (1996). *How does your engine run? A leader's guide to the Alert Program for self-regulation.* Albuquerque, NM

Appendix

Addressing Autism Spectrum Disorder in a School Based Setting: A Toolkit for Occupational Therapy Practitioners
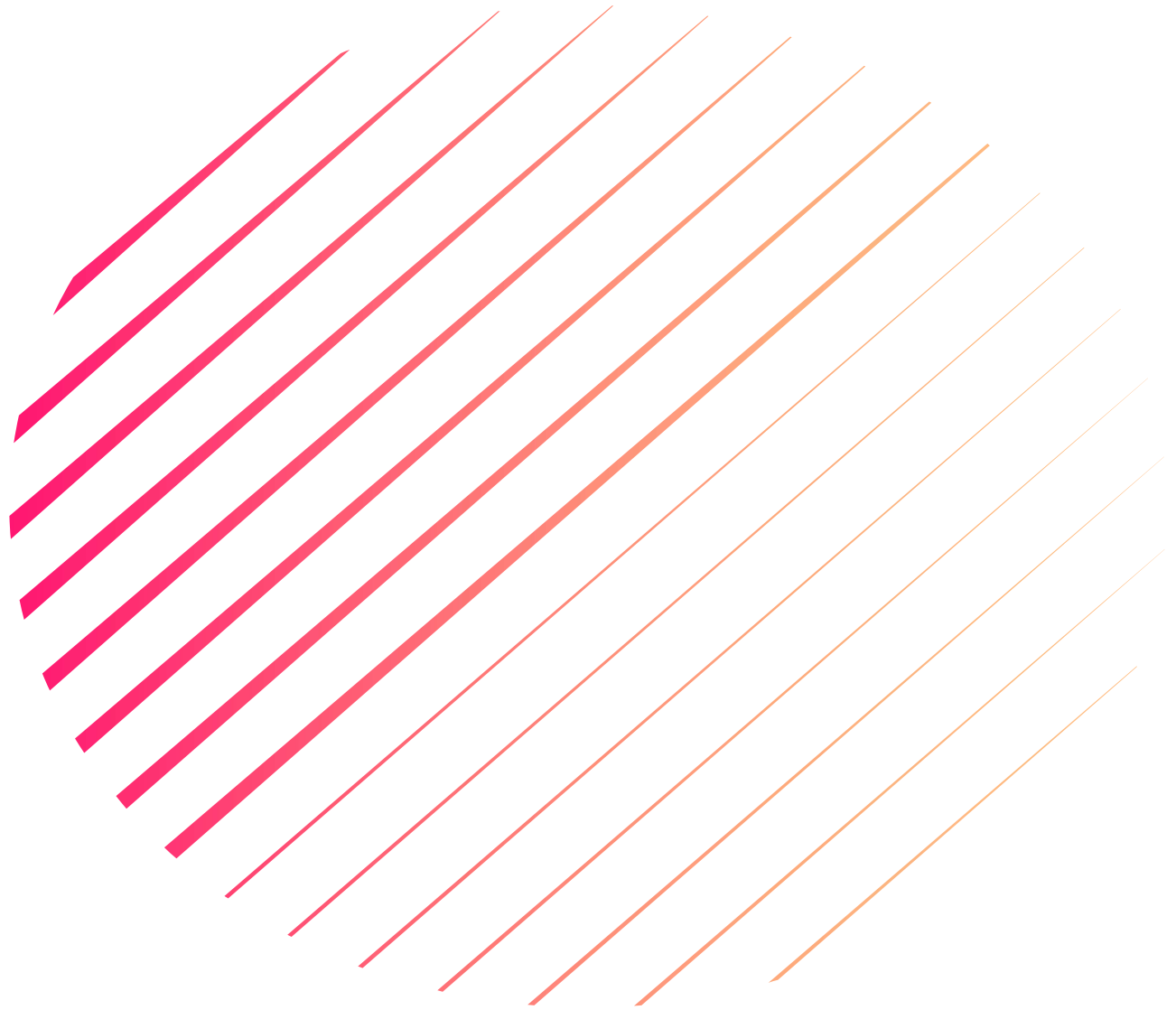
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Table of Contents

Introduction

Overview of the Toolkit

      The overall purpose of this toolkit is to assist occupational therapy practitioners and school professionals to facilitate increased occupational performance for children with autism spectrum disorder (ASD) within the school setting. The toolkit provides an overview of best practices with student with ASD, explains the model used to develop the toolkit, and provides interventions for occupational performance issues from a multi-tiered system of support. The toolkit also includes multiple tables that give information on the different constructs of the model, commonly used assessments, and interventions that can be used at all three tiers. Lastly, the toolkit includes both ready to use and references to manualized interventions that can be implemented by both occupational therapy practitioners and school professions to facilitate increase occupational performance in the school setting.

Autism Spectrum Disorder (ASD):

      Autism spectrum disorder is defined as having two distinct features. These features are "persistent deficits in social communication and social interactions across multiple contexts" and "restricted, repetitive, patterns of behavior, interests, or activities" (American Psychiatric Association, 2013). Due to these deficits and behaviors, there are many areas that students with a diagnosis of ASD experience challenges. Areas of occupations that students with ASD must complete within the school setting include education, social participation, play and leisure, and activities of daily living (Cahill & Bazyk, 2020). Person factors that influence these occupations include a variety of things. The first being children with an ASD diagnosis having difficulty with having the skills to appropriately participate socially with their peers (Alexander & Kuhaneck, 2015; Dean & Chang, 2021; Njelsani & Samaan, 2021; Tanner et al., 2015). Children with ASD also often have difficulties with sensory processing which leads to challenges with developing the skills of inhibitory control, auditory sustained attention, and short-term verbal memory which are all skills needed to be successful within the school setting (Pastor-Cerezuela et al., 2020). Another area of challenge that was found for students with an ASD diagnosis is difficulty with motor planning and due to this, children with ASD often are delayed in the development of motor skills needed to participate in the school setting (Ruggeri et al., 2019). Ambrose et al. (2020) found that children with an ASD diagnosis had difficulty developing the skills of executive functioning and joint attention. The evidence has also found that children with an ASD diagnosis often have challenges with engagement and attention, friendship, peer interaction, managing emotions and behavior, routines, and executive function skills (Alexander & Kuhaneck, 2015). This toolkit was created with these challenges in mind to make sure that they are targeted to increase occupational performance for children with ASD within the school setting.

School-based Service Delivery Model:

      The school-based service delivery model that was used in the creation of this product was Multi-Tiered Systems of Support (MTSS; Clark, 2018). Multi-Tiered Systems of Support are made possible by the Individual with Disabilities Education Act (IDEA) and Every Student Succeeds Act (ESSA). They are made up of three tiers where service is provided, tier 1 services frequently being served in the natural classroom within general education, tier 2 services being provided to students who are considered at risk typically in a small group setting and tier 3 being

special education services where the student is pulled out of the general education learning environment and frequently worked with one on one (Clark, 2018).

Theoretical Background

The model that was chosen to guide this product the Person Environment Occupation (PEO) model (Law et al., 1996). This model was chosen due to it being easily understood not only by occupational therapy practitioners but all other professionals as well. This model is easily understood because it looks at three main constructs which are the Person, Environment, and the Occupations (Law et al., 1996). It then takes these three constructs and looks how they interact with each other to facilitate an increase or decrease in occupational performance (Law et al., 1996). This way of viewing these constructs allows the occupational therapy practitioner or school professional to view all aspects impacting occupational performance in the school setting. By implementing this model in the development of this toolkit it allows the occupational therapy practitioner and other school professionals to easily understand and implement it to better serve and increase occupational performance for children with ASD within the school setting.

Toolkit Objectives:
- Facilitate increased occupational performance for children with ASD within the school setting.
- Increase use of evidence-based interventions in all three tiers of MTSS within the school setting.
- Provide evidence-based interventions that are easily implementable by occupational therapy practitioners and school professionals who work with children with ASD.

<div align="center">

Section I
Performance Analysis to Identify Potential Interventions
</div>

Before occupational therapy practitioners and school professionals provide interventions to facilitate increased occupational performance for children with ASD within the school setting, they must first complete a performance analysis to gain a better understanding of the person, environment, and occupations that are being completed. These analyses can be completed at all three tiers of MTSS. This means that occupational therapy practitioners in the school setting can be analyzing an entire school district, school, or classroom in tier 1, a small group of students in tier 2, or an individual student in tier 3. Since the analysis can be completed at all three tiers the person as discussed previously can be the entire school district or school, a classroom of students, a small group of students, or an individual student.

One method of observation that can be completed to analyze occupational performance for the person, environment, or occupation is skilled observation. This involves the occupational therapy practitioner or school professional observing the specific construct to determine aspects that are positively or negatively impacting occupational performance. Another method to complete analysis is through formal assessment. For analyzing children with ASD within the school setting there have been many assessments identified that can be useful. Most of these assessments look at the sensory aspect of those children due to this being a frequent challenge for these students that has a negative impact on occupational performance. Due to the specificity of what these interventions evaluate they are best used at tier 3 and occasionally tier 2. However, all the interventions listed in the product can be utilized at all three tiers and the occupational therapy practitioner should use their clinical judgement to determine which assessment is the

best fit for that student. A comprehensive list of assessments frequently used within the school system with a description of each and what tier they are most used at are listed in Table 1. Overall, to determine what interventions will be post impactful on occupational performance all aspects of the person, environment, and occupation must be analyzed. Table 2 provides a broad analysis of the person, environment, and occupation based on the literature. However occupational therapy practitioners and school professionals must complete this chart for each situation as the person, environment, and occupation are variable.

      The Person is a construct of the PEO model that is made up of their physical, cognitive, sensory, and affective abilities and characteristics (Law et al., 1996). Regarding this toolkit the person can be viewed as a variety of things. These include an individual, a group of students, an entire classroom of students, or the entire student body. It is important for the occupational therapy practitioner or school professional who is completing the analysis to understand who the "person" is that they are analyzing. A comprehensive breakdown on the person within the school setting is outlined in Table 2.

      The environment is a construct of the PEO model that is made up of the physical, cultural, institutional, and social, socio-economic environments and the characteristics of each (Law et al., 1996). Regarding this toolkit the environment can be anything within the school district that falls into any of those categories of characteristics. It is important for the occupational therapy practitioner or school profession who is completing the analysis to take into all aspects of the environment to best use this toolkit. A comprehensive breakdown of the school environment is provided in Table 2.

      The occupation is a construct of PEO that is made up of the different tasks that make up what the person does (Law et al., 1996). It is important for the occupational therapy practitioner or school professional completing the analysis to understand all the different tasks that are required to complete the occupation in order to effectively utilize this toolkit. A comprehensive list of the occupations and the tasks and skills required to complete those occupations is listed in Table 2.

Table 1 *Assessments*

Common Assessments for Children with ASD at Tiers 1, 2, and 3		
Assessments of the Person		
Assessment Title	**Purpose of Assessment**	**Tier Most Commonly Used At**
Informal Assessment of Teacher/School's Curriculum/Teaching Method	The assessment is the occupational therapy practitioner informally assessing through observation and clinical judgement the school/teacher's curriculum and teaching style.	Tier 1
Beery-Buktenica Developmental Test of Visual Motor Integration (5th ed.) (Beery VMI) (Beery et al., 2010)	The assessment is a paper pencil test that is used to screen visual motor integration deficits (Beery et al., 2010)	Tier 2 and 3
Detailed Assessment of Speed of Handwriting (DASH) (Barnett et al., 2007)	The assessment is for ages 9-16 and measures handwriting speed and fine motor skills of the child. It is made up of 5 subtests including copy best, alphabet writing, copying fast, graphic speed, and free writing (Barnett et al., 2007).	Tier 2 & 3
Evaluation Tool of Children's Handwriting (ETCH) (Amundson, 1995)	The assessment is for grades 1-6 and looks at the student's legibility, speed with writing the alphabet and numbers, near and far point copying, dictation, and sentences. It also assesses pencil grasp, hand preference, pressure, and manipulation of the writing utensil (Amundson, 1995).	Tier 2 & 3
School Assessment of Motor and Process Skills (School AMPS) (Fisher & Bryze, 1998)	The assessment is for ages 3-15 and measures 25 schoolwork tasks within the categories of writing, drawing, coloring, cutting, pasting, and computer work (Fisher & Bryze, 1998).	Tier 2 & 3
School Function Assessment (SFA) (Coster et al., 1998)	The assessment is for kindergarten-6th grade students. It rates the student's functional performance for tasks that they complete within the school setting. It rates them on the scales of participation, task supports, and activity performance (Coster et al., 1998).	Tier 2 & 3
School Setting Interview (SSI) (Hemmingsson, et al., 2005)	The assessment is a semi-structured interview that assesses the fit between the student and the environment to determine what needs for accommodations those students need (Hemmingsson et al., 2005).	Tier 2 & 3

Sensory Profile (Dunn, 1999)	The assessment is made up of 125 items that caregivers are asked to answer to describe responses to sensory stimuli. It is divided into three types of sensory stimuli which are: sensory processing, sensory modulation, and behavioral and emotional responses (Dunn, 1997).	Tiers 2 & 3
Sensory Experiences Questionnaire (Baranek, 1999a)	The assessment is a 21-item questionnaire that is filled out a caregiver to measures the child's behavioral responses to sensory experiences (Baranek, 1999a).	Tiers 2 & 3
Sensory Processing Assessment for Young Children (Baranek, 1999b)	The assessment is made up of observational, semi-structured, and play based portions. The purpose of this assessment is to identify patterns of sensory processing in children with a diagnosis of ASD or Development Disability. It has sections including approach/avoidance, orienting to unexpected sensory stimuli, habituation to repeated stimuli, and unusual sensory-seeking behaviors (Baranek, 1999b).	Tiers 2 & 3
Sensory Processing Measure (Parham et al., 2021)	The assessment is based on a parent and/or teaching completing a rating scale evaluating the child's social participation, praxis, and sensory processing issues (Parham et al., 2021).	Tiers 2 & 3
Sensory Processing Scale Assessment (Schoen et al., 2014)	The assessment measures sensory functioning using yes/no questions about behavioral responses in 7 sensory domains (Schoen et al., 2014).	Tiers 2 & 3
Tactile Defensiveness and Discrimination Test Revised (Baranek, 2010)	The assessment utilizes structured behavioral observation of children completed play-based tactile tasks to determine tactile processing of children with ASD or developmental disability (Baranek, 2010).	Tiers 2 & 3
The Infant Toddler Social Emotional Assessment (Carter & Briggs-Gowan, 2006)	The assessment utilizes parent report to determine social/emotional and behavioral problems in infants and toddlers. While doing this it addresses sensory issues the infants and toddler may have (Carter & Briggs-Gowan, 2006).	Tiers 2 & 3
Japanese Sensory Inventory Revised (Ota, 2004)	The assessment utilizes caregiver report to determine behavioral responses to stimuli in 8 categories for children ages 4-6 years old (Ota, 2004).	Tiers 2 & 3
Sensory Perception Quotient (Tavassoli, et al., 2014)	The assessment utilizes self-reporting on a questionnaire to adults with a diagnosis of ASD to determine hyper and hyposensitivity across different sensory aspects of their life (Tavassoli, et al., 2014).	Tiers 2 & 3

Sensory Questionnaire (Boyd & Baranek, 2005)	The assessment utilizes a questionnaire to determine if children with ASD have in the last 3 months or prior to the previous 3 months but not now displayed difficulty with sensory processing (Boyd & Baranek, 2005).	Tiers 2 & 3
Sensory Sensitivity Questionnaire (Minshew & Hobson, 2008)	The assessment utilizes both a self-report and parent report questionnaire to determine as sensory sensitivities the person may have (Minshew & Hobson, 2008).	Tiers 2 & 3
Sensory Sensitivity Questionnaire Revised (Talay-Ongan & Wood, (2000)	The assessment utilizes caregiver report questionnaire of yes/no questions to determine if the child has sensory sensitivities in the areas of auditory, tactile, visual, gustatory, vestibular, and olfactory (Talay-Ongan & Wood, 2000).	Tier 2 & 3
School Setting Interview (SSI) (Hemmingsson, et al., 2005)	The assessment is a semi-structured interview that assesses the fit between the student and the environment to determine what needs for accommodations those students need (Hemmingsson et al., 2005).	Tier 2 and 3
Assessments of the Environment		
Assessment Title	**Purpose of Assessment**	**Tier Most Commonly Used At**
Informal Assessment of Environment and Ergonomic Setup	The assessment is an informal observation of the classroom setup and ergonomics of desks for all students to determine areas of need or improvement.	Tier 1
School Setting Interview (SSI) (Hemmingsson, et al., 2005)	The assessment is a semi-structured interview that assesses the fit between the student and the environment to determine what needs for accommodations those students need (Hemmingsson et al., 2005).	Tier 2 & 3
Refreshing Recess Environmental Analysis (Every Moment Counts) (Mohler et al., 2014)	The assessment is a part of the Every Moment Counts "Refreshing Recess". This assessment involves observing recess to determine the characteristics of recess that are going well and that are not going well (Mohler et al., 2014).	Tiers 1, 2, & 3
Comfortable Cafeteria Assessment (Demirjian et al., 2014)	This assessment is a part of the Every Moment Counts "Comfortable Cafeteria". It involves observing and analyzing the cafeteria environment to determine strengths and challenges (Demirjian et al., 2014).	Tiers, 1, 2, & 3
Assessments of the Occupation		
Assessment Title	**Purpose of Assessment**	**Tier/s To Be Used At**

Refreshing Recess Environmental Analysis (Every Moment Counts) (Mohler et al., 2014)	The assessment is a part of the Every Moment Counts "Refreshing Recess". This assessment involves observing recess to determine the characteristics of recess that are going well and that are not going well (Mohler et al., 2014).	Tiers 1, 2, & 3
Comfortable Cafeteria Assessment (Demirjian et al., 2014)	This assessment is a part of the Every Moment Counts "Comfortable Cafeteria". It involves observing and analyzing the cafeteria environment to determine strengths and challenges (Demirjian et al., 2014).	Tiers, 1, 2, & 3

Application of the PEO Evaluation Process to MTSS

Below are case studies that give examples of the person environment and occupations at tiers 1, 2, and 3. Table 3 provides an example of how to fill out Table 5 for the tier 1 case study to gain a better understanding of everything impacting his occupational performance within the school setting and to provide a resource on how to best utilize this table. Table 4 is a blank table that is provided for occupational therapy practitioners to complete when to better understand what is impacting occupational performance and then to utilize that information to make an informed decision on best interventions to select for that situation.

Table 2 *Table with school factors to consider*

Occupational Performance		
Assessment of the Performance Issue: <mark>Insert Performance Issue Here</mark>		
Possible Assessments: *Person-* Evaluation of teacher/school's curriculum *Environment-* Informal observation and ergonomic assessment of environment. *Occupation-* Task Analysis		
Person (Individual, Group, Classroom, or School)	**Environment**	**Occupations**

Physical:
  - Motor Skills
  - Body size
  - Fine motor skills
  - Gross motor skills
Cognitive:
  - Cognitive level of the person
Sensory:
  - Hearing abilities
  - Vision abilities
  - Proprioceptive abilities
  - Touch abilities
  - Olfactory abilities
  - Taste abilities
Affective:
  - Emotional Regulation
  - Executive Functioning
  - Current Mood
	Physical:
	  - School building
	  - Playground and equipment
	  - Individual classroom
	  - Seating type
	  - Lunchroom
	  - Gymnasium
	  - Location of the school
	  - Urban vs. Rural
	Cultural:
	  - Values and beliefs of students
	  - Values and beliefs of staff members
	  - Norms of school
	  - Norms of classroom
	Institutional:
	  - School Curriculum
	  - Policies
	    o District wide
	    o School wide
	    o Classroom rules
	  - School Funding
	Social:
	  - Number of staff members
	    o Teachers
		Educational Performance:
		  - Executive Functioning
		  - Motor Performance
		  - Sensory Processing
		  - Engagement and Attention
		  - Managing Emotions and Behaviors
		  - Routines
		Social Participation:
		  - Social Communication and Peer Interaction
		  - Friendship
		Activities of Daily Living:
		  - Dressing
		  - Eating
		  - Toileting
		  - Basic Hygiene
		Play:
		  - Participation in games in classroom
		  - Recess

	○ Paraprofessionals ○ Occupational Therapy Practitioners ○ Physical Therapy Practitioners ○ Speech Language Pathologists ○ School Psychologists ○ Administrators - Number of students in school **Socio-economic:** - Funding for school - Socio-economic status of student or students in school	

Tier 1 Case Study

It was reported to you the occupational therapy practitioner that the students in 1st grade at a Title 1 public elementary school in a metropolitan area have been having difficulties with attention and emotional regulation during the handwriting class which is negatively impacting the students' ability to participate in classroom work. The school is composed of students from a variety of races, ethnicities, and cultural beliefs and backgrounds. This class takes place in the homeroom classroom of each teacher's room. These classrooms are open air classrooms that are only divided by half walls. Teachers provide instruction during class over microphones as required by the school district. Students complete handwriting seated at their individual wooden desks that are designed with arm rests on the right side for right-handed students. Students participate in the handwriting class for 15 minutes before lunch/recess each day and are all given 1-inch single line paper to complete their handwriting exercises. They are allowed to utilize whatever writing utensil they choose that day with utensils used including wooden pencils, mechanical pencils, pens, and markers. The teacher completes each handwriting class by instructing in the front of the room and writing on the marker board for the students to copy. Currently there is no paraprofessional or other staff support in the classroom during the handwriting portion of this class. The teacher reports that the students in their classrooms frequently complain of the work being too hard, being distracted, worrying about mistakes, and having poor writing mechanics. The teacher has asked you to use this information to decipher what may be contributing to the students' difficulties.

Table 3 *Completed table for Case Study 1*

Occupational Performance		
Assessment of the Performance Issue: <mark>*Handwriting*</mark>		
Possible Assessments: *Person*- Evaluation of current handwriting curriculum. *Environment*- Classroom Observation and ergonomic evaluation of desk setup. *Occupation*- Evaluation of handwriting (observe table groups/determine how handwriting is graded)		
Person (Individual, Group, <mark>Classroom,</mark> or School)	**Environment**	**Occupations**

Physical:
- 1st grade students
- Difficulty with fine motor skills negatively impacting writing
- No noted physical impairments
Cognitive:
- Low frustration tolerance
- Low confidence in abilities
Sensory:
- No noted sensory deficits.
Affective:
- No noted difficulties with emotional regulation or executive function.
	Physical:
	- Wooden Desks
	  o Desks designed for right-handed students.
	- Open-air classroom with half wall dividers
	- Elementary School
	- Metropolitan City
	- 1-inch lined paper
	- Writing Utensils
	  o Pens
	  o Mechanical Pencils
	  o Wooden Pencils
	  o Markers
	- Urban Setting of School
	Cultural:
	- Diverse school with a wide variety of races, ethnicities, and cultural beliefs and backgrounds
	- Located in Midwest of United States
	Institutional:
	- Public School District
		Educational Performance:
		- Needed for completing written assignments.
		- Executive Functioning to remember formation and sizing.
		- Motor Performance.
		- Engagement and attention needed to complete assignments.
		- Emotional Regulation to complete difficult tasks
		Social Participation:
		- Needed for writing notes to peers or teachers
		Activities of Daily Living:
		- N/A
		Play:
		- Needed for participation in games with peers

	- Requirement of teachers to use microphones when instructing - Funding provided by school district - Curriculum developed by the school district - Title 1 School - Located in Nebraska - Follows state laws **Social:** - 1st Grade Homeroom Teachers - Occupational Therapist **Socio-economic:** - Title 1 Elementary School - Located in Midwest United States	

Tier 2 Case Study

It was reported to you the occupational therapy practitioner that a small group of 4 students with a diagnosis of autism spectrum disorder are having difficulty with organization of their materials during their English portion of class. The students are struggling to turn in assignments on time and get work done during class time due to not being able find assignments from the previous day in their desks. These students also have been reported to be hypersensitive to auditory stimuli. The students are currently in the 5th grade at a Title 1 public elementary school in a metropolitan area that is composed of students from a variety of races, ethnicities, and cultural beliefs and backgrounds. These students are in a small group with a resource teacher for English class due to frequently being behind on their assignments. This group takes place at a small table in the back of the student' homeroom teacher's classroom. For this small group the teacher is not required to speak on the microphone. However, the student's homeroom teacher in the front of the classroom is instructing other groups utilizing her microphone as well as teachers in the other open-air classrooms with small half wall dividers nearby. Students are provided with chairs with a back rest and their feet can touch the floor but the teacher reports students frequently complete assignments while moving from standing to sitting throughout. All students in this group use wooden pencils provided by the teacher or laptops provided by the school to complete their assignments. The teacher writes with marker on the table in front of each student to provide directions for each assignment. There is no other paraprofessional or other staff support besides the resource teacher during this group. The teacher has asked you to use this information to decipher what aspects may be contributing to the students' difficulties.

Tier 3 Case Study

It was reported to you the occupational therapy practitioner that Bobby a student with a diagnosis of autism spectrum disorder who is now in the 2nd grade. He attends a Title 1 public elementary school in a metropolitan area. Bobby frequently has outbursts, covers his ears, or lays on floor when he is assigned to complete a task that involves math Bobby completes his math tasks in his homeroom classroom at his desk with support from both his homeroom teacher and a paraprofessional. Bobby's desk is a wooden desk with an arm rest on the right side designed for right-handed students. Bobby utilizes a functional tripod grasp in his left hand when completing writing tasks and utilizes as wooden pencil as his primary writing utensil. Bobby has difficulty with both number sizing and formation frequently making numbers too small or too large or reversing the numbers 6, 9, and 7. Bobby's teacher also reports that Bobby in the past has had difficulties with motor planning. When corrected Bobby yells, screams, and lays on the floor. When Bobby has difficulty with the assignment, he is completing he frequently covers his ears and yells. When another classroom nearby is participating in a lesson and that teacher is instructing on the microphone or Bobby's class is completing an assignment that involves loud sounds such as a video or music playing Bobby also covers his ears and lays on the floor. Bobby's teacher did report that when he is pulled out of the classroom completes a math task one on one, his number reversals decrease but he continues to have difficulty with sizing. The teacher has asked you to use this information to decipher what aspects may be contributing to Bobby's behaviors and difficulties.

Table 4 *Blank occupational performance table*

Occupational Performance		
Assessment of the Performance Issue:		
Possible Assessments: *Person-Environment-Occupation-*		
Person (Individual, Group, Classroom, or School)	**Environment**	**Occupations**
Physical: **Cognitive:** **Sensory:**	**Physical:** **Cultural:** **Institutional:** **Social:**	**Educational Performance:** **Social Participation:** **Activities of Daily Living:** **Play:**

Affective:	Socio-economic:	

Section II
Developing Interventions Utilizing PEO Transactions

As outlined earlier the main constructs of the PEO model are the person, environment, and occupation (Law et al., 1996). A more in-depth view of these constructs and what makes up them was provided previously in the analysis section. These three constructs impact each other to impact occupational performance (Law et al., 1996). The interactions between these three constructs are called transactions (Law et al., 1996). These transactions occur in daily life to impact occupational performance for children with ASD within the school setting in the areas of education, social participation, activities of daily living, and play. The transactions that can occur are as follows P x E, P x O, and O x E. However, when utilizing this toolkit, the occupational therapy practitioner or school professional needs to view how all three constructs interact with one another. This interaction forms an overall transaction of P x E x O. To create this transaction an analysis as described previously must be thoroughly completed to make sure all aspects of the person, environment, and occupation are considered. Once that is done transactions must be created based on that information. By looking at this comprehensive transaction rather than the individual transactions listed above it allows the occupational therapy practitioner or school professional to gather a full picture of all aspects impacting occupational performance. Since these transactions are made up of all three constructs it is important that the occupational therapy practitioner provide interventions that target all three constructs. By doing this they can improve each construct area which will increase occupational performance the most. However, once interventions are implemented analysis of all three constructs and transactions need to continue to occur so that existing interventions can be modified, and new interventions implemented if required.

How to select interventions using the toolkit
1. Complete performance analysis utilizing table above and described in section two to determine all aspects of person, environment, and occupation.
2. Utilize aspects of person, environment, and occupation in table to form transactions.
3. Determine if those transactions are positively or negatively impacting occupational performance.
4. Determine the skill that is needed to increase occupational performance.
5. Go to that skill on intervention table and select appropriate intervention/s.
6. Determine which tier that intervention/s should be provided.
7. Implement the intervention/s as the table instructs for that tier.

Case Study Transactions:

Below are the three case studies that were utilized in the analysis section. Table 5 provides examples of two transactions for each of the tier 1, 2, and 3 case studies. These transactions each include an intervention from Table 6 that match that transaction as a feasible option to implement, however, some transactions may benefit from multiple interventions being utilized to facilitate maximal occupational performance. Table 5 also includes explanations for how each of these interventions target all three constructs of the PEO (Law et al., 1996) model.

Tier 1 Case Study

It was reported to you the occupational therapy practitioner that the students in 1st grade at a Title 1 public elementary school in a metropolitan area have been having difficulties with attention and emotional regulation during the handwriting class which is negatively impacting the students' ability to participate in classroom work. The school is composed of students from a variety of races, ethnicities, and cultural beliefs and backgrounds. This class takes place in the homeroom classroom of each teacher's room. These classrooms are open air classrooms that are only divided by half walls. Teachers provide instruction during class over microphones as required by the school district. Students complete handwriting seated at their individual wooden desks that are designed with arm rests on the right side for right-handed students. Students participate in the handwriting class for 15 minutes before lunch/recess each day and are all given 1-inch single line paper to complete their handwriting exercises. They are allowed to utilize whatever writing utensil they choose that day with utensils used including wooden pencils, mechanical pencils, pens, and markers. The teacher completes each handwriting class by instructing in the front of the room and writing on the marker board for the students to copy. Currently there is no paraprofessional or other staff support in the classroom during the handwriting portion of this class. The teacher reports that the students in their classrooms frequently complain of the work being too hard, being distracted, worrying about mistakes, and having poor writing mechanics. The teacher has asked you to use this information to decipher what may be contributing to the students' difficulties.

Tier 2 Case Study

It was reported to you the occupational therapy practitioner that a small group of 4 students with a diagnosis of autism spectrum disorder are having difficulty with organization of their materials during their English portion of class. The students are struggling to turn in assignments on time and get work done during class time due to not being able find assignments from the previous day in their desks. These students also have been reported to be hypersensitive to auditory stimuli. The students are currently in the 5th grade at a Title 1 public elementary school in a metropolitan area that is composed of students from a variety of races, ethnicities, and cultural beliefs and backgrounds. These students are in a small group with a resource teacher for English class due to frequently being behind on their assignments. This group takes place at a small table in the back of the student' homeroom teacher's classroom. For this small group the teacher is not required to speak on the microphone. However, the student's homeroom teacher in the front of the classroom is instructing other groups utilizing her microphone as well as teachers in the other open-air classrooms with small half wall dividers nearby. Students are provided with chairs with a back rest and their feet can touch the floor but the teacher reports students frequently complete assignments while moving from standing to sitting throughout. All students in this group use wooden pencils provided by the teacher or laptops provided by the school to complete their assignments. The teacher writes with marker on the table in front of each student to provide directions for each assignment. There is no other paraprofessional or other staff support besides the resource teacher during this group. The teacher has asked you to use this information to decipher what aspects may be contributing to the students' difficulties.

Tier 3 Case Study

It was reported to you the occupational therapy practitioner that Bobby a student with a diagnosis of autism spectrum disorder who is now in the 2nd grade. He attends a Title 1 public elementary school in a metropolitan area. Bobby frequently has outbursts, covers his ears, or lays on floor when he is assigned to complete a task that involves math Bobby completes his math tasks in his homeroom classroom at his desk with support from both his homeroom teacher and a paraprofessional. Bobby's desk is a wooden desk with an arm rest on the right side designed for right-handed students. Bobby utilizes a functional tripod grasp in his left hand when completing writing tasks and utilizes as wooden pencil as his primary writing utensil. Bobby has difficulty with both number sizing and formation frequently making numbers too small or too large or reversing the numbers 6, 9, and 7. Bobby's teacher also reports that Bobby in the past has had difficulties with motor planning. When corrected Bobby yells, screams, and lays on the floor. When Bobby has difficulty with the assignment, he is completing he frequently covers his ears and yells. When another classroom nearby is participating in a lesson and that teacher is instructing on the microphone or Bobby's class is completing an assignment that involves loud sounds such as a video or music playing Bobby also covers his ears and lays on the floor. Bobby's teacher did report that when he is pulled out of the classroom completes a math task one on one, his number reversals decrease but he continues to have difficulty with sizing. The teacher has asked you to use this information to decipher what aspects may be contributing to Bobby's behaviors and difficulties.

Table 5 *PEO Transactions*

Tier 1 P x E x O Transaction 1		
Person	**Environment**	**Occupation**
1st Grade Students have low confidence in their abilities.	School curriculum requires them to complete the work.	The occupation of educational performance requires emotional regulation to complete the occupation.
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**
Calm Moment Cards- Writing and Completing Work (Kolic et al., 2016)	Managing Emotions and Behaviors	This intervention targets the *person*'s beliefs about themselves to complete *environment*'s required curriculum while also providing the *occupation*'s needed skill of emotional regulation.
Tier 1 P x E x O Transaction 2		
Person	**Environment**	**Occupation**
1st grade students are having difficulty with the motor requirements to complete legible handwriting.	School curriculum requires them to complete their handwriting work, but the teacher is not providing any motor lessons or intervention currently.	The occupation of educational performance requires motor skills to be able to complete writing on assignments to complete the required schoolwork.
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**
Increasing Motor Performance for Students with Autism Spectrum Disorder	Motor Performance	This intervention targets the *person*'s motor skills by providing teacher who is a part of the social *environment*, the knowledge to teach motor skills that will increase the occupational performance in the *occupation* of educational performance.
Tier 2 P x E x O Transaction 1		
Person	**Environment**	**Occupation**
Small group of 5th grade students with autism spectrum disorder who are	The English small group is taking place in the back of a classroom.	Executive functioning and sensory processing are needed to be able to complete the occupation of educational performance.

having difficulty with organization.		
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**
Executive Functioning Tips and Strategies for Students with Autism Spectrum Disorder Utilizing MTSS.	Executive Functioning	This intervention targets the *person*'s executive functioning by providing strategies to the social *environment* of the teacher to that target the *occupation* of educational performance.
Tier 2 P x E x O Transaction 2		
Person	**Environment**	**Occupation**
Small group of 5th grade students with autism spectrum disorder who are hypersensitive to auditor stimuli.	The small group takes place in the back of an open-air classroom with lots of external auditory stimuli.	Sensory processing is required to be able to maintain attention on the task the student is completing to participate in the occupation of educational performance.
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**
Sensory Interventions and Strategies for Students with Autism Spectrum Disorder	Sensory Processing	This intervention targets the *person* by providing interventions to the social *environment* of the teacher and adaptations that can be made to the *environment* to assist with sensory processing during the *occupation* of educational performance.
Tier 3 P x E x O Transaction 1		
Person	**Environment**	**Occupation**
Bobby is a student with autism spectrum disorder who frequently has outbursts when he receives feedback to correct his schoolwork.	Bobby's teacher provides Bobby feedback when his work is incorrect.	Completing the occupation of educational performance requires emotional regulation when receiving feedback.
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**

Alert Program: How Does Your Engine Run (Williams & Shellenberger, 1996)	Managing Emotions and Behavior	This intervention targets the *person*'s emotional regulation through teaching them strategies that they can use which the social *environment* of the teacher is aware of and can help the *person* to implement which will increase the skill of emotional regulation when receiving feedback that is needed to complete the *occupation* of educational performance.

Tier 3 P x E x O Transaction 2		
Person	**Environment**	**Occupation**
Bobby has difficulty maintaining attention and completing assignments.	Work time takes place within Bobby's main homeroom classroom.	Attention and Engagement are required to be able to maintain attention on the task the student is completing to participate in the occupation of educational performance.
Intervention		
Intervention	**Location in Appendix A**	**Reasoning**
Improving Engagement and Attention in Students with Autism Spectrum Disorder Utilizing MTSS	Engagement and Attention	This intervention targets the physical *environment* and the social *environment* of the teacher to increase attention for the *person* which positively impact the *occupation* of educational performance.

Table 6 *Interventions*

Effective Interventions to Facilitate Educational Performance	
Skill Targeted	**Interventions** *Some interventions are listed under more than one skill as they target multiple skills*

Executive Functioning	**Manualized Interventions:**
	Alert Program: How Does Your Engine Run? (Williams & Shellenberger, 1996)
	- Price: $40.00
	- Link to intervention: https://www.alertprogram.com/product/alert-program-how-does-your-engine-run/
	- Description:
	   o This is an evidence-based program that provides instructions for leaders of the program on how to best implement it and teach it to parents. It involves 12 steps with activities within each step to teach children self-regulation strategies (Williams & Shellenberger, 1996).
	- MTSS
	   o Tier 1
	      ■ Occupational therapy practitioner or school staff member leads entire class through 12 steps/activities.
	   o Tier 2
	      ■ Occupational therapy practitioner or school staff members leads small group of students with difficulties with self-regulation through 12 steps/activities.
	   o Tier 3
	      ■ Occupational therapy practitioner works with individual student who has difficulty with self-regulation through 12 steps/activities.
	
	Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
	- Price: $49 (AOTA Member) $69 (Non-Member)
	- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
	- Description:
	   o This intervention utilizes cognitive strategies to improve performance on specific tasks such as executive function skills for problem solving. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the

	intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al. 2017)
	- MTSS
	   o Tier 1
	      ▪ The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process for developing a specific executive functioning skill.
	   o Tier 2
	      ▪ The occupational therapist leads a small group of students in the goal, plan, do check, process for developing an executive functioning skill.
	   o Tier 3
	      ▪ The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student on a chosen executive functioning skill.

	Originally Developed Interventions:
	Executive Functioning Tips and Strategies for Students with Autism Spectrum Disorder Utilizing MTSS
	- Location: Appendix A
	- Description:
	   o This handout provides tips and strategies that occupational therapy practitioners can provide to teachers and other school staff members to implement to promote improvement in executive functioning at all three tiers of MTSS.
	- MTSS
	   o Within this handout it provides tips and strategies that are geared specifically for Tiers 1, 2, and 3 individually.

Motor Performance	**Manualized Interventions:** *SPARK Program* (Spark PE, n.d.) - Price: $49.95-$89.95 - Link to intervention: https://sparkpe.org/ - Description: o SPARK is an evidence-based guide to program for physical education classes. It provides a variety of curriculums for physical education with the most relevant for the ASD population being the inclusive PE curriculum. SPARK has been found to increase the motor abilities of children with ASD (Najafabadi et al., 2018).

- MTSS
    - Tier 1
        - Implementing the main SPARK program in the general PE classroom.
    - Tier 2
        - Implementing SPARK's inclusive physical education into the PE classroom for specific needs.
    - Tier 3
        - Implementing strategies from SPARK's inclusive physical education to a child one on one.

Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
- Price: $49 (AOTA Member) $69 (Non-Member)
- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
- Description:
    - This intervention utilizes cognitive strategies to improve performance on motor skills. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
- MTSS
    - Tier 1
        - The occupational therapist collaborates with the physical education or educates the teacher on how to complete the goal, plan, do check process.
    - Tier 2
        - The occupational therapist leads a small group of students in the goal, plan, do check, process for improving motor skills.
    - Tier 3
        - The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student on a specific motor skill that child would like to work on.

Originally Developed Interventions:
Increasing Motor Performance for Students with Autism Spectrum Disorder

	- Location: Appendix B and presentation can be accessed at: https://docs.google.com/presentation/d/1QnPb2IAuaxB-_z7ofEYvTz0peXnyeWh-0tsBzi2suOQ/edit?usp=sharing
	- Description:
	    o This intervention provides an indirect method of assisting students with ASD with motor learning. It provides resources that can be taught to and given to school staff by the occupational therapy practitioner so that it may be implemented with students with ASD.
	- MTSS
	    o Tier 1
	        ▪ The occupational therapy practitioner presents this presentation as an in-service to all school staff members on motor learning.
	    o Tier 2
	        ▪ The occupational therapy practitioner presents this presentation as a small in-service to the special education department.
	    o Tier 3
	        ▪ The occupational therapy practitioner presents this presentation one on one education on motor learning to a teacher who works with a student with ASD who has difficulty with motor skills.

Sensory Processing	**Manualized Interventions:**
	Alert Program: How Does Your Engine Run? (Williams & Shellenberger, 1996)
	- Price: $40.00
	- Link to intervention: https://www.alertprogram.com/product/alert-program-how-does-your-engine-run/
	- Description:
	    o This is an evidence-based program that provides instructions for leaders of the program on how to best implement it and teach it to parents. It involves 12 steps with activities within each step to teach children self-regulation strategies (Williams & Shellenberger, 1996).
	- MTSS
	    o Tier 1
	        ▪ Occupational therapy practitioner or school staff member leads entire class through 12 steps/activities.
	    o Tier 2

	▪ Occupational therapy practitioner or school staff members leads small group of students with difficulties with self-regulation through 12 steps/activities.
	  o Tier 3
	    ▪ Occupational therapy practitioner works with individual student who has difficulty with self-regulation through 12 steps/activities.

	Originally Developed Interventions:
	Sensory Interventions and Strategies for Students with Autism Spectrum Disorder
	  - Location: Appendix C
	  - Description:
	    o This handout provides sensory interventions and strategies in the categories of multi-sensory interventions, direct interventions, and environmental modifications.
	  - MTSS
	    o These interventions can be provided at all three tiers of MTSS. The occupational therapist can utilize their clinical judgement and expertise to determine which strategies or interventions will be most useful for the student and at what tier they should be used.

Engagement and Attention	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016)
	  - Price: Free
	  - Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	  - Description:
	    o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	  - MTSS
	    o Tier 1
	      ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	    o Tier 2

	▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom. o Tier 3 ▪ Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.
	Originally Developed Interventions: *Improving Engagement and Attention in Students with Autism Spectrum Disorder Utilizing MTSS* - Location: Appendix: D - Description: This handout provides a variety of strategies that an occupational therapy practitioner or teacher can implement to improve attention and engagement to school related activities for students with ASD. - MTSS o This handout breaks down strategies that can be utilized for students with ASD by each of the tiers of MTSS. However, some of these tips may be able to be generalized to multiple tiers as well.

Managing Emotions and Behaviors	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	- Description:
	  o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	- MTSS
	  o Tier 1
	    ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	  o Tier 2

- Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.
  - o Tier 3
    - Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.

Alert Program: How Does Your Engine Run? (Williams & Shellenberger, 1996)
- Price: $40.00
- Link to intervention: https://www.alertprogram.com/product/alert-program-how-does-your-engine-run/
- Description:
  - o This is an evidence-based program that provides instructions for leaders of the program on how to best implement it and teach it to parents. It involves 12 steps with activities within each step to teach children self-regulation strategies (Williams & Shellenberger, 1996).
- MTSS
  - o Tier 1
    - Occupational therapy practitioner or school staff member leads entire class through 12 steps/activities.
  - o Tier 2
    - Occupational therapy practitioner or school staff members leads small group of students with difficulties with self-regulation through 12 steps/activities.
  - o Tier 3
    - Occupational therapy practitioner works with individual student who has difficulty with self-regulation through 12 steps/activities.

Originally Developed Interventions:
Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting
- Location: Appendix E
- Description: This handout provides general guidelines for developing a social story. It also includes specific tips for tailoring social stories to a group of students, individual students, and students who are non-verbal. This handout can be utilized to help students learn and develop positive behavioral responses within the school setting.
- MTSS

	o These guidelines and tips can be applied at all three tiers of MTSS. However, the group social story development is most likely to be implemented at tiers 1 and 2 and the individualized tips and tips for non-verbal students are most likely to be implemented at tiers 2 and 3.

Routines	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016)
	  - Price: Free
	  - Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	  - Description:
	    o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	  - MTSS
	    o Tier 1
	      ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	    o Tier 2
	      ▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.
	    o Tier 3
	      ▪ Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.

	Originally Developed Interventions:
	Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting
	  - Location: Appendix E
	  - Description: This handout provides general guidelines for developing a social story. It also includes specific tips for tailoring social stories to a group of students, individual students, and

	students who are non-verbal. This handout can be utilized to help students better grasp their routine and have less unexpected behaviors within their routine. - MTSS o These guidelines and tips can be applied at all three tiers of MTSS. However, the group social story development is most likely to be implemented at tiers 1 and 2 and the individualized tips and tips for non-verbal students are most likely to be implemented at tiers 2 and 3.
Effective Interventions to Facilitate Social Participation	
Skill Targeted	**Interventions** *Some interventions are listed under more than one skill as they target multiple skills*

Social Communication and Peer Interaction	**Manualized Interventions:**
	Refreshing Recess (Mohler et al., 2014)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/refreshing-recess/
	- Description:
	  o 6-week program that occupational therapy practitioners can implement in the school setting to promote an inclusive and positive experience at recess (Mohler et al., 2014)
	- MTSS
	  o Tier 1
	      ▪ Implementing this program for the whole school.
	  o Tier 2
	      ▪ School staff skilled in facilitating this program observe recess, identify, and make accommodations for children as needed to promote inclusivity and positive recess experience.
	  o Tier 3
	      ▪ School staff skilled in facilitating this program create plans with school personnel who work with students with significant need to accommodate so that a positive recess experience is achieved.
	Comfortable Cafeteria (Demirjian et al., 2014)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/comfortable-cafeteria/
	- Description

- o This program provides information for staff that work in the cafeteria at a school on how to promote a positive and successful environment. It includes 6 weeks of lessons to promote this goal (Demirjian et al., 2014)
- MTSS
  - o Tier 1
    - Occupational therapy practitioner provides in-service to all school staff on how to implement this program in the general cafeteria.
  - o Tier 2
    - Occupational therapy practitioner or school staff implements this in alternative areas where lunch is eaten by students.
  - o Tier 3
    - Occupational therapy practitioner or school staff implements this in alternative areas where lunch is eaten by students.

Online Course: Social Skills for Children with Autism Spectrum Disorder (ASD) (AOTA, n.d.)
- Price: $49.95 (AOTA Member) or $64.94 (Non-Member)
- Link to intervention: https://myaota.aota.org/shop_aota/product/OL4897
- Description:
  - This continuing education course provides instructions on how to implement an evidence based social skills intervention called "SIMPLE" (Social Interaction Motor Planning Exercise) for students with high functioning ASD. This intervention includes 11 warm-up activities and 10 role-play activities with videos on how to implement each.
- MTSS
  - o Tier 1
    - Occupational therapy practitioner provides this intervention to an entire classroom.
  - o Tier 2
    - Occupational therapy practitioner provides this intervention to a small group of children with high functioning ASD.
  - o Tier 3
    - *Not appropriate as a Tier 3 intervention.*

Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)

	- Price: $49 (AOTA Member) $69 (Non-Member)
	- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
	- Description:
	    o This intervention utilizes cognitive strategies to improve performance on specific tasks in child chosen goals. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
	- MTSS
	    o Tier 1
	        ▪ The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process to improve social participation and/or social skills.
	    o Tier 2
	        ▪ The occupational therapist leads a small group of students in the goal, plan, do check, process to improve social participation and/or social skills.
	    o Tier 3
	        ▪ The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student to improve social participation and/or social skills.

	Originally Developed Interventions: *Improving Social Participation and Social Skills for Students with Autism Spectrum Disorder in the School Setting* Location: Appendix F - Description: This handout provides tips and strategies for how to promote appropriate social skills and increase social participation for children with ASD as well as specific intervention styles to teach those skills. - MTSS o The tips, strategies, and interventions included in this handout can be implemented at all three tiers of MTSS at the occupational therapy practitioner's discretion for what they feel is needed for that specific child.
Friendship	**Manualized Interventions:** *Online Course: Social Skills for Children with Autism Spectrum Disorder (ASD)* (AOTA, n.d.)

	- Price: $49.95 (AOTA Member) or $64.94 (Non-Member)
	- Link to intervention: https://myaota.aota.org/shop_aota/product/OL4897
	- Description:
	    ▪ This continuing education course provides instructions on how to implement an evidence based social skills intervention called "SIMPLE" (Social Interaction Motor Planning Exercise) for students with high functioning ASD. This intervention includes 11 warm-up activities and 10 role-play activities with videos on how to implement each.
	- MTSS
	    ○ Tier 1
	        ▪ Occupational therapy practitioner provides this intervention to an entire classroom.
	    ○ Tier 2
	        ▪ Occupational therapy practitioner provides this intervention to a small group of children with high functioning ASD.
	    ○ Tier 3
	        ▪ *Not appropriate as a Tier 3 intervention.*

	Originally Developed Interventions: *Improving Social Participation and Social Skills for Students with Autism Spectrum Disorder in the School Setting* Location: Appendix F - Description: This handout provides tips and strategies for how to promote appropriate social skills and increase social participation for children with ASD as well as specific intervention styles to teach those skills. Specifically, this handout has strategies for working with peers and peer-mediated interventions that can be implemented to foster friendships for the student with ASD. - MTSS ○ The tips, strategies, and interventions included in this handout can be implemented at all three tiers of MTSS at the occupational therapy practitioner's discretion for what they feel is needed for that specific child.
Effective Interventions to Facilitate Activities of Daily Living
Skill Targeted	**Interventions** *Some interventions are listed under more than one skill as they target multiple skills*

Dressing	**Manualized Interventions:**
	Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
	- Price: $49 (AOTA Member) $69 (Non-Member)
	- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
	- Description:
	o This intervention utilizes cognitive strategies to improve performance on specific tasks in child chosen goals. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
	- MTSS
	o Tier 1
	▪ The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process to improve the specific dressing skill chosen.
	o Tier 2
	▪ The occupational therapist leads a small group of students in the goal, plan, do check, process to improve the specific dressing skill chosen.
	o Tier 3
	▪ The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student to improve the specific dressing skill chosen.
	Originally Developed Interventions:
	Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting
	- Location: Appendix E
	- Description: This handout provides general guidelines for developing a social story. It also includes specific tips for tailoring social stories to a group of students, individual students, and students who are non-verbal. This handout can be utilized to help students learn and implement the steps of dressing such as shoe-tying or putting on a coast in the school setting.
	- MTSS
	o These guidelines and tips can be applied at all three tiers of MTSS. However, the group social story development is most likely to be implemented at tiers 1 and 2 and the

	individualized tips and tips for non-verbal students are most likely to be implemented at tiers 2 and 3. *Activities of Daily Living Interventions for Students with Autism Spectrum Disorder Utilizing MTSS* - Location: Appendix G - Description: This handout is broken down into multiple ADLs. The dressing section breaks down different interventions to assist students with ASD with completing different dressing tasks that have to be completed within the school setting. - MTSS o The dressing section of this handout breaks down the intervention strategies by each tier of MTSS with tier 3 having the most interventions as it is the most targeted and individualized tier.

Eating	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	- Description:
	    o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	- MTSS
	    o Tier 1
	        ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	    o Tier 2
	        ▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.
	    o Tier 3

- Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.

Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
- Price: $49 (AOTA Member) $69 (Non-Member)
- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
- Description:
  - This intervention utilizes cognitive strategies to improve performance on specific tasks in child chosen goals. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
- MTSS
  - Tier 1
    - The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process for eating skills.
  - Tier 2
    - The occupational therapist leads a small group of students in the goal, plan, do check, process for eating skills.
  - Tier 3
    - The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student for eating skills.

Originally Developed Interventions:
Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting
- Location: Appendix E
- Description: This handout provides general guidelines for developing a social story. It also includes specific tips for tailoring social stories to a group of students, individual students, and students who are non-verbal. This handout can be utilized to help students learn and implement skills for eating.
- MTSS
  - These guidelines and tips can be applied at all three tiers of MTSS. However, the group social story development is most likely to be implemented at tiers 1 and 2 and the

	individualized tips and tips for non-verbal students are most likely to be implemented at tiers 2 and 3. *Activities of Daily Living Interventions for Students with Autism Spectrum Disorder Utilizing MTSS* - Location: Appendix G - Description: This handout is broken down into multiple ADLs. The eating section breaks down different interventions to assist students with ASD with completing eating within the school setting. - MTSS o The eating section of this handout breaks down the intervention strategies by each tier of MTSS with tier 3 having the most interventions as it is the most targeted and individualized tier.

Toileting	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	- Description:
	    o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	- MTSS
	    o Tier 1
	        ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	    o Tier 2
	        ▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.
	    o Tier 3

- Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.

Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
- Price: $49 (AOTA Member) $69 (Non-Member)
- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
- Description:
  - This intervention utilizes cognitive strategies to improve performance on specific tasks in child chosen goals. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
- MTSS
  - Tier 1
    - The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process for toileting skills.
  - Tier 2
    - The occupational therapist leads a small group of students in the goal, plan, do check, process for toileting skills.
  - Tier 3
    - The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student for toileting skills.

Originally Developed Interventions:
Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting
- Location: Appendix E
- Description: This handout provides general guidelines for developing a social story. It also includes specific tips for tailoring social stories to a group of students, individual students, and students who are non-verbal. This handout can be utilized to help students learn and develop positive toileting behaviors and skills.
- MTSS
  - These guidelines and tips can be applied at all three tiers of MTSS. However, the group social story development is most likely to be implemented at tiers 1 and 2 and the

	individualized tips and tips for non-verbal students are most likely to be implemented at tiers 2 and 3. *Activities of Daily Living Interventions for Students with Autism Spectrum Disorder Utilizing MTSS* - Location: Appendix G - Description: This handout is broken down into multiple ADLs. The toileting section breaks down different interventions to assist students with ASD with completing eating within the school setting. - MTSS o The toileting section of this handout breaks down the intervention strategies by each tier of MTSS with tier 3 having the most interventions as it is the most targeted and individualized tier.

Basic Hygiene	**Manualized Interventions:**
	Cognitive Approach to Daily Occupational Performance (CO-OP) (Dawson et al., 2017)
	- Price: $49 (AOTA Member) $69 (Non-Member)
	- Link to intervention: https://myaota.aota.org/shop_aota/product/900478U
	- Description:
	   o This intervention utilizes cognitive strategies to improve performance on specific tasks in child chosen goals. It utilizes a process of goal, plan, do, check. Which involves the child setting a goal in collaboration with the leader of the intervention, making a plan to achieving that goal, putting the plan into action, and checking the progress (Dawson et al., 2017).
	- MTSS
	   o Tier 1
	      ▪ The occupational therapist collaborates with the classroom or educates the teacher on how to complete the goal, plan, do check process to work on the needed hygiene skill.
	   o Tier 2
	      ▪ The occupational therapist leads a small group of students in the goal, plan, do check, process to work on the needed hygiene skill.
	   o Tier 3
	      ▪ The occupational therapist pulls an individual student out of the classroom and completes goal, plan, do, check individually with that student to work on the needed hygiene skill.

	Originally Developed Interventions: *Activities of Daily Living Interventions for Students with Autism Spectrum Disorder Utilizing MTSS* - Location: Appendix G - Description: This handout is broken down into multiple ADLs. The basic hygiene section breaks down different interventions to assist students with ASD with completing basic hygiene tasks within the school setting. - MTSS o The basic hygiene section of this handout breaks down the intervention strategies by each tier of MTSS with tier 3 having the most interventions as it is the most targeted and individualized tier.
Effective Interventions to Facilitate Play
Skill Targeted	**Interventions** *Some interventions are listed under more than one skill as they target multiple skills*

Participation in Games Within Classroom	**Manualized Interventions:**
	Calm Moment Cards (Kolic et al., 2016).
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	- Description:
	   o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	- MTSS
	   o Tier 1
	      ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	   o Tier 2
	      ▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.

	o Tier 3 ▪ Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.
	Originally Developed Interventions: *Improving Social Participation and Social Skills for Students with Autism Spectrum Disorder in the School Setting* Location: Appendix F - Description: This handout provides tips and strategies for how to promote appropriate social skills and increase social participation for children with ASD as well as specific intervention styles to teach those skills. Specifically, this handout has strategies for how to create or adapt games to foster increased participation for students with ASD with their peers during these games. - MTSS o The tips, strategies, and interventions included in this handout can be implemented at all three tiers of MTSS at the occupational therapy practitioner's discretion for what they feel is needed for that specific child.

Recess with Peers	**Manualized Interventions:**
	Refreshing Recess (Mohler et al., 2014)
	- Price: Free
	- Link to intervention: https://everymomentcounts.org/refreshing-recess/
	- Description:
	  o 6-week program that occupational therapy practitioners can implement in the school setting to promote an inclusive and positive experience at recess (Mohler et al., 2014)
	- MTSS
	  o Tier 1
	    ▪ Implementing this program for the whole school.
	  o Tier 2
	    ▪ School staff skilled in facilitating this program observe recess, identify, and make accommodations for children as needed to promote inclusivity and positive recess experience.
	  o Tier 3
	    ▪ School staff skilled in facilitating this program create plans with school personnel who work with students with significant need to accommodate so that a positive recess experience is achieved.

	Calm Moment Cards (Kolic et al., 2016)
	    - Price: Free
	    - Link to intervention: https://everymomentcounts.org/calm-moments-cards/
	    - Description:
	        o Calm moment cards are a program that be applied in large groups, small groups or individually. It provides cards that assist with self-regulation and behaviors in the multiple areas including "start of the day, test taking, transitioning between subjects, transitioning between classes, using the restroom, playing at recess, returning from recess, participation in physical education, eating in the cafeteria, participating in assemblies, participating in art, writing/completing work, emergency situations, end of the day routine, participating in parties or school events, and completing homework" (Kolic et al., 2016).
	    - MTSS
	        o Tier 1
	            ▪ Occupational therapy practitioner educates school staff on use of cards so that they can be implemented as a whole class OR Occupational therapy practitioner leads entire classroom in activity.
	        o Tier 2
	            ▪ Occupational therapy practitioner leads a group of students on utilizing the cards in a school special education classroom.
	        o Tier 3
	            ▪ Occupational therapy practitioner or school staff utilizes one card that is most relevant with a child one on one outside the classroom.

	Originally Developed Interventions:
	Improving Social Participation and Social Skills for Students with Autism Spectrum Disorder in the School Setting
	Location: Appendix F
	    - Description: This handout provides tips and strategies for how to promote appropriate social skills and increase social participation for children with ASD as well as specific intervention styles to teach those skills. Specifically, this handout has strategies for how to create leadership opportunities or adapt activities so that students with ASD feel successful when playing with their peers.
	    - MTSS

	o The tips, strategies, and interventions included in this handout can be implemented at all three tiers of MTSS at the occupational therapy practitioner's discretion for what they feel is needed for that specific child.

Appendices

Executive Functioning Tips and Strategies for Students with Autism Spectrum Disorder Utilizing MTSS	

Tier 1 (Universal/Core Instruction in General Classroom)	- Positively reinforce skills that you would like to be developed in the classroom and use consistent language for what the skill is to avoid confusion (Kenworthy et al., 2014).
	   o Example: You are working with your classroom on developing the skill of creating a plan before starting an assignment. When students initiate this strategy have a reward system set in place to reinforce the behavior.
	- Develop and provide classroom supports that encourage time management and organization (Wong et al., 2015).
	   o Example: Provide students with name labels for all individual items and subject labels for all cubbies, folders, etc.
	- Model and encourage cognitive flexibility in the classroom with your students (Wong et al., 2015).
	   o Praise students when they compromise on decisions such as brainstorming a topic the class is going to write about.
	- Exercise and Yoga may be effective interventions in improving success in education for children with ASD. (Weaver, 2015).
	   o Example: Leading the class in a short yoga or exercise activity prior to the start of class. (Be cautious of exercises that may increase energy level and decrease focus).

Tier 2 (Small group/Targeted Interventions)	- If a small group of students is having difficulty with MTSS create a small group and teach cognitive strategies (Tomchek & Koenig, 2016).
	   o Example: Verbalizing the steps of a task before completing it or crossing off steps on a list as the student completes them during a task.
	- When students are having difficulty with joint attention simplifying the social environment may improve educational performance.
	   o Example: Pulling students out who are having difficulty with joint attention into a small group will decrease demand on the social environment.

Tier 3 (Intensive Individualized Intervention)	- Completing the same work that is being done in the classroom when pulling a student out for occupational therapy increase transferability of the skill back to the classroom (Clark, 2018).
	   o Example: The child's class is working on coloring within the lines. When pulling a student out incorporate that skill into the session.
	- Providing physical activity breaks can improve executive functioning and academic performance by removing repetitive movements that inhibit this skill (Tanner et al., 2015).
	   o Example: Provide the student a chance to choose and participate in an approved movement activity outside of the classroom prior to working on a difficult or time-consuming assignment.

Appendix B: Motor Learning PowerPoint Presentation

Increasing Motor Performance for Students with Autism Spectrum Disorder

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What is Motor Performance?

- It is made up of all of the motor skills, praxis, and motor-based occupational performance skills (May-Benson, 2018).
  - Motor Skills
    - Basic motor abilities of the student - balance, imitation skills, etc. (May-Benson, 2018).
  - Praxis
    - Ability to plan and complete goal directed movements - planning and setting up an obstacle course, initiating playing with toys in a variety of ways (May-Benson, 2018).
  - Motor-based occupational performance skills
    - Functional motor skills used in everyday life skills - shoe-tying, handwriting, etc. (May-Benson, 2018).

Why target motor performance?

- Difficulties with motor performance are one of the most common features of autism spectrum disorder (Dziuk et al., 2007; Fournier et al., 2010).
  - The most commonly impacted areas of motor performance are coordination and praxis (Dziuk et al., 2007; Fournier et al., 2010).

Areas of Intervention for Motor Performance in the School Setting

- Environmental Supports
- Skill Building
- Cognitive Interventions
- Behavior Interventions

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Environmental Supports

- Modifications of the physical environment to compensate for difficulties with motor performance (May-Benson, 2018).
- Examples (May-Benson, 2018):
  - Use of a slant board for wrist positioning and better pencil control
  - Pencil adaptations for proper grip
  - Seat cushions to facilitate postural control
  - Modified paper
  - Adaptive shoestrings
  - Built up utensils
  - Oversized gloves or gloves with gripping material for catching balls in physical education class.

Skill Building

- Teaching a client a specific skill and then have them repeatedly practice that skill to refine it (Bremer et al., 2015).
  - Initially break larger tasks down into smaller pieces to learn all skills required for that task.
    - Example: Shoe-tying
      - Start with a shoe-tying board and practice one step repeatedly until learned before adding the next step.
- This intervention has also been found to be effective for ball skills and skills needed for physical education (Bremer et al., 2015).

Cognitive Intervention

- Utilize problem solving techniques to have the individual bring attention to deficits and determine how to fix them (May-Benson, 2018).
  - Should only be used with students with adequate communication, executive function, and regulation skills (May-Benson, 2018).
  - Example: Video Modeling (May-Benson, 2018)
    - Recording the student completing the activity and then watching it to determine areas of difficulty and how to improve them.

Behavior Interventions

- Positive Reinforcement (May-Benson, 2018)
  - Rewarding the student with a stimuli they enjoy after successful completion of motor activity
- Examples of skills it can be used with:
  - Unzipping backpack
  - Completing school assignments
  - Squeezing scissors

References

Bremer, E., Balogh, R., & Lloyd M. (2015). Effectiveness of a fundamental motor skill intervention for 4-year-old children with autism spectrum disorder: A Pilot study. *Autism, 19,* 980-991 https://doi.org/10.1177/1362361314557548

Dziuk, M. A., Larson, J. C., Apostu, A., Mahone, E. M., Denckla, M. B., & Mostofsky, S. H. (2007). Dyspraxia in autism: association with motor, social, and communicative deficits. *Developmental Medicine and Child Neurology, 49,* 734-739 https://doi.org/10.1111/j.1469-8749.2007.00734.x

Fournier, K. A., Hass, C. J., Naik, S. K., Lodha, N., & Cauraugh, J. H. (2010). Motor coordination autism spectrum disorders: and meta analysis *Journal of Autism and Developmental Disorders, 40,* 227-1240 https://doi.org/10.1007/s10803-010-0981-3

May-Benson, T. A. (2018). Improving motor skills and praxis for increased participation for individuals with ASD. In R. Watling & S. Spitzer (Eds.), Autism across the lifespan A comprehensive occupational therapy approach 311-305 The American Occupational Therapy Association.

Appendix C: Sensory Interventions and Strategies Handout

Sensory Interventions and Strategies for Students with Autism Spectrum Disorder	

Multi-Sensory Interventions	- Promote activities that provide multisensory feedback to the student (Mailoux & Smith-Roley, 2018).
	   o Finding items in a sensory bin.
	      ▪ Fill a bin with rice, small toys, toy coins, etc. and have student locate preferred items in the bin.
	      ▪ Adapt to be more academic related to locating letters in bin to spell a word or name.
	      ▪ Challenge the senses more by having the student complete with their eyes closed or wearing gloves.
	   o Utilizing laminated mats as Play Dough Mats
	      ▪ Mats with letters on them work on letter formation.
	      ▪ Create numbers with play dough to do simple math problems.
	      ▪ Cut the play dough before placing onto the mat to work on scissor skills.
	   o Provide fidgets that target multiple senses (Be aware of disruptions it may cause in classroom)
	      ▪ A bubble tube that also has beads inside of it.
	      ▪ Two pop bottles taped together and filled with beads, beans, rice, etc. to make a rain stick.
	      ▪ Fidget spinners provide both visual and tactile feedback.

Direct Interventions	- For students who are hyperresponsive to tactile input Qigong massage being provided as sensory training has been found to be effective in decreasing tactile hyper-responsiveness. This massage is a deep pressure massage that involves tapping of the child to provide deep pressure and decrease hypersensitivity to tactile input (Bodison & Parham, 2018).
	   o YouTube has many videos on strategies for implementing this massage type.
	- In general, slow linear swinging has not been found to have an immediate impact on attention and engagement after completion of this intervention (Bodison & Parham, 2018).
	   o However, specific students with ASD may have vestibular needs that slow linear swinging may be effective with so occupational therapists should use their clinical judgement when implementing this intervention (Bodison & Parham, 2018).
	- Heavy work activities have been found to help students regulate and maintain a functional state of arousal (American Journal of Occupational Therapy, 2015).
	   o Examples in a school setting:
	      ▪ Wiping down tables after lunch or in a classroom.
	      ▪ Pushing a cart of books back to the library.
	      ▪ Mopping or sweeping (add weight to broom or mop to increase input).
	- Allow students to work in smaller groups or wear noise cancelling headphones to decrease stimulation (Clark, 2018).

Environmental Modifications	- If cognitively able assist students in identifying sensory situations that overstimulate them and collaborate to create a plan during these situations (American Journal of Occupational Therapy, 2015).
	      o Example:
	          ▪ A student reports overstimulation at school assemblies during times of chanting or loud music. To assist with this the student has an accommodation to be notified of when these sounds will take place and remove himself from the room prior to the sound taking place.
	 - Flexible seating options within the classroom lead to decreased behaviors and increase in ability to stay within the natural classroom for students with ASD (American Journal of Occupational Therapy, 2015).
	 - Provide a variety of equipment on school playgrounds to promote various sensory experiences for children (American Journal of Occupational Therapy, 2015).
	 - Decrease or increase sensory input (sound boards, dividers, noise cancelling headphones, etc.) within the classroom environment as needed to fit each student's needs (American Journal of Occupational Therapy, 2015).
	 - Have the classroom set up with opportunities for access to different sensory input during breaks or instruction at the teacher's discretion (Clark, 2018).

Appendix D: Engagement and Attention Handout

Improving Engagement and Attention in Students with Autism Spectrum Disorder Utilizing MTSS	
Tier 1 (Universal/Core Instruction in General Classroom)	- Installing sound absorbing walls into classrooms can decrease stimuli and improve attention for students with auditory sensitivities (Kinnealey et al., 2012). - Installing lights with non-fluorescent bulbs can decrease stimuli and improve attention for students with visual sensitivities (Kinnealey et al., 2012). - Utilizing positive behavioral reinforcements can increase attention (Wong et al., 2015). - Provide visual cues to follow along with when teaching to the entire class and limit other visual stimuli in the environment (Wong, 2015). - Reduce the number of auditory stimuli in the environment and increase the volume of the speaker (Wong et al., 2015). - Utilize a visual timer to help students maintain focus and understand the amount of time they have for an assignment (Wong et al., 2015). - Incorporate movement into activities or provide movement breaks throughout longer lessons (Wong et al., 2015)
Tier 2 (Small group/Targeted Interventions)	- Provide a variety of instruction methods to meet the needs of each individual learner (Wong et al., 2015). - Allow students to complete writing in a variety of methods (Wong et al., 2015). o Example: Typed, Transcribed, Written, etc.
Tier 3 (Intensive Individualized Intervention)	- Utilize special objects or preferred topics during assignments to increase buy in and attention (Dunst et al., 2012). o Example: A student's preferred topic is dogs. Utilize dogs when teaching math by practicing adding up how many dogs there are. - Break larger tasks into small chunks (Wong et al., 2015).

Appendix E: Effective Social Story Writing Handout

Effective Social Story Writing for Students with Autism Spectrum Disorder in the School Setting	

General Guidelines	- Must be made up of three parts (Tanner, 2018).
	    o Introduction: state the topic of the story.
	    o Body: Describe in detail what is taking place.
	    o Conclusion: Restate the topic of the story and emphasize the purpose or lesson being learned.
	- Should describe both the situation and the expectations you have for the student's behavior (Tanner, 2018).
	- Make sure to include who, what, where, when, why, and how of the behavior that is being targeted (Tanner, 2018).
	- Most sentences in the story should provide only facts, describe someone's feelings, what others will do to help the student, or affirm specific points such as "this is good" (Tanner, 2018).
	- Unless the client has a high cognitive level, 1st person sentences should be used (Tanner, 2018).
	    o One exception is when negative behavior is described it should be in third person (Tanner, 2018).
	- Use as few directive sentences as possible (Tanner et al., 2018).
	- Pictures or illustrations should always be used to increase understanding of the story (Tanner et al., 2018).
	- Title should frame the desired behavior positively (Tanner et al., 2018).

Group Social Stories	- Length, wording, and organization should be at a level all members of the group understand (Tanner, 2018). - Teachers should reach a social story immediately before a class activity for best carry through to that activity (Tanner, 2018).
Individualized Social Stories	- Length, wording, and organization should be at a level the student understands (Tanner, 2018). - Allow the student to read the social story themselves immediately before the target behavior/activity of the social story is completed (Tanner, 2018). - Incorporate the student's preferred topics, if possible, to motivate the student to learn (Clark, 2018).
Social Stories for Non-Verbal Students	- Length, wording, and organization should be at a level the student understands (Tanner, 2018). o Utilizing short phrases or pictures only for non-verbal students. - Social stories are best understood when the student can read them themselves so writing it in a method that is easily understandable to the student increases the impact of the social story (Tanner, 2018).

Appendix F: Social Skills and Participation Handout

Improving Social Participation and Social Skills for Students with Autism Spectrum Disorder in the School Setting	

Tips and Strategies	- Teach peers strategies on how to successfully interact with students with ASD (Wong et al., 2015).
	- Offer leadership opportunities to students with ASD in small group settings within the classroom (Wong et al., 2015)
	- Use the student's preferred activities and topics to create games for that student to participate in with peers to increase social participation with peers (Case-Smith et al., 2014).
	- Prevent and/or immediately address bullying (Ttofi & Farrington, 2011).
	- Provide verbal cues on desired social behaviors (Tanner, 2018)
	    o Example: Explaining that another student is sticking out their fist for a "fist bump".
	- Ask the student a question to get them to complete social action you want them to complete (Tanner, 2018).
	    o Example: Asking the student "can you pass the dice to your friend?"
	- Show pictures or videos to the student of appropriate social interactions (Tanner, 2018).
	- Social skills interventions are best implemented in the child's natural environment to increase carryover (Dean & Chang, 2021).
	    o Example: On the playground, playing games in the classroom, physical education class, etc.
	- If using peer-mediated social skills training it is recommended that peers also receive training prior to being a part of the social skills training (Dean & Chang, 2021).
	- Teaching students with ASD social skills, norms, and rules allowed them to better identify behavior that was negative or threatening towards them and decreased bullying (Njelesani & Samaan, 2021).

Specific Interventions	- Group-based Social Skills Training (Tanner, 2018)
	    o Example: Create a small group of students identified to have difficulties with this and complete lessons on appropriate social skills and allow time for role-playing.
	- Peer-mediated Social Skills Training (Tanner, 2018)
	    o Example: Partner a student with ASD with a typically developing student and complete a role-playing activity with the students reflecting on how the activity went together.
	- Activity-based Social Skills Training (Tanner, 2018)
	    o Example: Use a simple activity such as building with Legos to teach social skills.
	- Computer-based Social Skills Training (Tanner, 2018)
	    o Example: Provide the student with video modeling of appropriate student behavior and reflect with that student.
	- Create social stories for the designated social skill you are targeting (Tanner, 2018).
	    o Example: Create a social story for appropriate reaction or response when a peer asks the student to share or if they can play with that student.

Appendix G: Activities of Daily Living Handout

	Activities of Daily Living Interventions for Students with Autism Spectrum Disorder Utilizing MTSS

Dressing	- **Tier 1 (Universal/Core Instruction in General Classroom):**
	  o Allow adequate time for all students to be able to complete dressing tasks.
	  o Develop and read a social story on the specific dressing task each day before completing it in class.
	    ▪ Example: Teacher develops and reads a social story on the correct steps to putting on a coat each day before the class puts on their coats for recess.
	- **Tier 2 (Small group/Targeted Interventions):**
	  o The occupational therapy practitioner works with a small group of children on the steps of specific dressing skills.
	- **Tier 3 (Intensive Individualized Intervention):**
	  o Show a video of the steps to completing a dressing task to the student each time before practicing (Weaver, 2018).
	  o Create a social story on the specific dressing task the student is struggling with.
	  o Recommend the student wear loose fitting clothing if they have difficulty removing clothing (Weaver, 2018).
	  o Recommend the student wear pants with an elastic waist if they have difficulty with belts or buttons on pants (Weaver, 2018).
	  o Recommend any other adaptive clothing as needed.
	  o When teaching a student to put on a coat the most to least method has found to be effective (Çetrez-Iscan et al., 2016).
	    ▪ This method involves providing almost constant prompting at the beginning of learning the skill and then slowly decreasing the amount of prompting provided as the skill is learned (Cetrez-Isacan et al., 2016).
	  o Utilize pictures to sequence the steps of the hygiene task (Weaver, 2018).

Feeding	- **Tier 1 (Universal/Core Instruction in General Classroom):**
	  o Establish consistent and familiar routines for lunch each day (Ausdereau et al., 2018).
	  o Provide proper seating for each child (Ausdereau et al., 2018).
	  o Encourage utensil/cup use for all students (Ausdereau et al., 2018).
	- **Tier 2 (Small group/Targeted Interventions):**
	  o Seat students with ASD with typically developing peers and allow them to model desired behaviors at mealtimes (Ausdereau et al., 2018).
	- **Tier 3 (Intensive Individualized Intervention):**
	  o Operant conditioning (Marshall et al., 2013)
	    ▪ Prompt the student to try a food and when they do provide praise. or utilize "First Then" approach.
	  o Only provide food to the student that is at their skill level to be able to eat (Ausdereau et al., 2018).
	    ▪ Provide adaptive utensils and equipment as necessary for motor difficulties (Ausereau et al., 2018).

Toileting	- **Tier 1 (Universal/Core Instruction in General Classroom):**
	   o Place a sign reminding students to flush above each toilet at eye level.
	   o Develop and read a social story on sequencing the steps to going to the bathroom and reads it each day before the class bathroom break.
	       ■ Example: Teacher develops and reads a social story on the correct steps to utilizing the bathroom each day before a bathroom break.
	   o Have a grab bar installed in all stalls to assist students when on the toilet (Weaver, 2018).
	- **Tier 2 (Small group/Targeted Interventions):**
	   o Provide private bathrooms for students that may have a variety of physical or sensory needs (Weaver, 2018).
	- **Tier 3 (Intensive Individualized Intervention):**
	   o Utilize pictures to sequence the steps of the hygiene task (Weaver, 2018).
	       ■ Create a picture schedule for these steps and place it in the bathroom each time the student goes (Weaver, 2018).
	   o Create a social story on the specific sensory aspects and appropriate responses for an individual student (Weaver, 2018).
	       ■ Example: Create a social story on the sound of the toilet and pictures of when it will happen so that the student is prepared for this sound.
	   o Provide alternative toilet paper of a different texture to a student who is hypersensitive to tactile input (Weaver, 2018).

Basic Hygiene	- **Tier 1 (Universal/Core Instruction in General Classroom):**
	   o Develop and read a social story on washing hands and read each day before lunch.
	       ■ Example: Teacher develops and reads a social story on the correct steps of washing hands each day before the class goes to lunch.
	   o If completing toothbrushing in the school setting use sweet or child-friendly toothpaste (Weaver, 2018).
	- **Tier 2 (Small group/Targeted Interventions):**
	   o Utilize peer or video modeling in a small group to learn hygiene skills.
	- **Tier 3 (Intensive Individualized Intervention):**
	   o Create an individualized social story on a specific hygiene skill (Weaver, 2018).
	       ■ Teacher develops and implements a social story on how to deodorant.
	   o Minimize scents the student does not like and maximize the use of preferred scents during hygiene tasks (Weaver, 2018).
	   o Create an individualized hygiene kit for that specific student (Weaver, 2018).
	   o Utilize pictures to sequence the steps of the hygiene task (Weaver, 2018).

<div align="center">**References**</div>

Amundson, S. (1995). *Evaluation Tool of Children's Handwriting manual.* O.T. Kids.

AOTA. (2015). Occupational therapy for children and youth using sensory integration theory and

    methods in school-based practice. *American Journal of Occupational Therapy, 69.*

    https://doi.org/10.5014/ajot.2015.696S04

AOTA. (n.d.). *Online course: Social skills for children with autism spectrum disorder (ASD).*

    Retrieved March 27, 2022, from https://myaota.aota.org/shop_aota/product/OL4897

Ausdereau, K. K., Novak, P., & Gartland, S. (2018). Addressing eating, drinking, and mealtime

    participation for individuals with ASD. In R. Watling & S. L. Spitzer (Eds.), *Autism*

    across the lifespan A comprehensive occupational therapy approach (pp. 427-446). The

    American Occupational Therapy Association.

Baranek, G. T. (1999a). *Sensory Experiences Questionnaire manual (SEQ).* University of North

    Carolina.

Baranek, G. T. (1999b). *Sensory Processing Assessment for Young Children (SPA) manual.*

    University of North Carolina.

Baranek, G. T. (2010). *Tactile Defensiveness and Discrimination Test– Revised (TDDT-R)*

    manual. Springer.

Barnett, A, Henderson, S.E., Scheib, B. & Schulz. C. (2007). *The Detailed Assessment of Speed*

    of Handwriting manual. Pearson.

Beery, K. E., Buktenica, N. A., & Beery N. A. (2010). *The Beery–Buktenica Developmental Test*

    of Visual–Motor Integration: Administration, scoring, and teaching manual (6th ed.).

    Pearson.

Bodison, S. C., & Parham, L. D. (2018). Specific sensory techniques and sensory environmental

    modifications for children and youth with sensory integration difficulties: A systematic

    review. *American Journal of Occupational Therapy, 72.*

    https://doi.org/10.5014/ajot.2018.029413

Boyd, B. A., & Baranek, G. T. (2005). *Sensory Questionnaire (SQ) manual.* University of North

    Carolina.

Bremer, E., Balogh, R., & Lloyd M. (2015). Effectiveness of a fundamental motor skill

    intervention for 4-year-old children with autism spectrum disorder: A Pilot study. *Autism,*

    19, 980-991. https://doi.org/10.1177/1362361314557548

Carter, A. S., & Briggs-Gowan, M. J. (2006). *ITSEA: Infant-Toddler Social and Emotional*

    Assessment examiner's manual. PsychCorp.

Case-Smith, J., Fristad, M. A., & Weaver, L. L. (2014). A systematic review of sensory

    processing interventions for children with autism spectrum disorders. *Autism.*

    http://dx.doi.org/10.1177/1362361313517762

Çetrez-Iscan, G., Nurçin, E., & Fazlıoğlu, Y. (2016). Effect of most-to-least prompting

    procedure on dressing skill of students with autism. *Educational Research Review, 11*,

    1766-1774. DOI: 10.5897/ERR2016.2933

Clark, G. F. (2018). Participation in school for students with ASD. In R. Watling & S. L. Spitzer

    (Eds.), *Autism across the lifespan A comprehensive occupational therapy approach* (pp.

    389-403). The American Occupational Therapy Association.

Coster, W. J., Deeney, T. A., Haltiwanger, J. T., & Haley, S. M. (1998). *School Function*

    Assessment manual. Psychological Corporation/Therapy Skill Builders.

Dawson, D. R., McEwen, S. E., & Polatajko, H. J. (2017). *Cognitive orientation to daily occupational performance in occupational therapy: Using the co-op approach to enable participation across the lifespan*. AOTA Press.

Dean, M. & Chang, Y. (2021). A systematic review of school-based social skills interventions and observed social outcomes for students with autism spectrum disorder in inclusive settings. *Autism,* (1-16). https://doi.org/10.1177/13623613211012886

Demijian, L., Horvath, F., & Bazyk, S. (2014). *Comfortable Cafeteria.* Every Moment Counts.

Dunn, W. (1999). *Sensory Profile: User's manual*. Psychological Corporation.

Dunst, C. J., Hamby, D. W., & Trivette, C. M. (2012). Meta-analysis of studies incorporating the interests of young children with autism spectrum disorders into early intervention practices. *Autism Research and Treatment, 2012,* 1–10. http://dx.doi.org/10.1155/2012/462531

Dziuk, M. A., Larson, J. C., Apostu, A., Mahone, E. M., Denckla, M. B., & Mostofsky, S. H. (2007). Dyspraxia in autism: Association with motor, social, and communicative deficits. *Developmental Medicine and Child Neurology, 49,* 734-739. https://doi.org/10.1111/j.1469-8749.2007.00734.x

Fisher, A. G., & Bryze, K. (1998). *School AMPS: School version of the assessment of motor and process skills manual*. Three Star Press.

Fournier, K. A., Hass, C. J., Naik, S. K., Lodha, N., & Cauraugh, J. H. (2010). Motor coordination autism spectrum disorder: A synthesis and meta analysis. *Journal of Autism and Developmental Disorders, 40,* 1227-1240. https://doi.org/10.1007/s10803-010-0981-3

Hemmingsson, H., Egilson, S.T, Hoffman. O., & Kielhofner, G. (2005). *The School Setting Interview (SSI) manual.* Swedish Association of Occupational Therapists.

Kenworthy, L., Gutermuth A., L., Alexander, K. C., Naiman, D. Q., Cannon, L., Wills, M. C., Luong-Tran, C., Werner, M. A., Alexander, K. C., Strang, J., Bal, E., Sokoloff, J. L., & Wallace, G. L. (2014). Randomized controlled effectiveness trial of executive function intervention for children on the autism spectrum. *Journal of Child Psychology and Psychiatry, 55,* 374–383. https://doi.org/10.1111/jcpp.12161

Kinnealey, M., Pfeiffer, B., Miller, J., Roan, C., Shoener, R., & Ellner, M. L. (2012). Effect of classroom modification on attention and engagement of students with autism or dyspraxia. *American Journal of Occupational Therapy, 66,* 511–519. http://dx.doi.org/10.5014/ajot.2012.004010

Kolic, S., Deininger, A., Young, D., & Bazyk, S. (2016). *Calm Moment Cards.* Every Moment Counts.

LaVigna, G., & Willis, T. (2012). The efficacy of positive behavioural support with the most challenging behavior: The evidence and its implications. *Journal of Intellectual and Developmental Disability, 37,* 185–195. https://doi.org/10.3109/13668250.2012.696597

Mailoux, Z. & Smith-Roley, S. (2018). Ayres Sensory Integration® intervention for individuals with ASD. In R. Watling & S. L. Spitzer (Eds.), *Autism across the lifespan A comprehensive occupational therapy approach* (pp. 479-495). The American Occupational Therapy Association.

Marshal, J., Hill R. J., & Dodrill, P. (2013). A survey of practice for clinicians working with children with autism spectrum disorders and feeding difficulties. *International Journal of*

Speech-Language Pathology, 15, 279-285.

https://doi.org/10.3109/17549507.2013.777972

May-Benson, T. A. (2018). Improving motor skills and praxis for increased participation for

individuals with ASD. In R. Watling & S. L. Spitzer (Eds.), *Autism across the lifespan A

comprehensive occupational therapy approach* (pp. 305-318). The American

Occupational Therapy Association.

Minshew, N. J., & Hobson, J. A. (2008). Sensory sensitivities and performance on sensory

perceptual tasks in high-functioning individuals with autism. *Journal of Autism and

Developmental Disorders, 38(8),* 1485–1498. doi:10.1007/s10803-007-0528-4.

Mohler, R., Kerns, S., & Bazyk, S. (2014). *Refreshing Recess.* Every Moment Counts.

Najafabadi, M. G., Sheikh, M., Hemayattalab, R., Memari, A.-H., Aderyani, M. R., & Hafizi, S.

(2018). The effect of spark on social and motor skills of children with autism. *Pediatrics

& Neonatology*, *59*(5), 481–487. https://doi.org/10.1016/j.pedneo.2017.12.005

Njelesani, J. & Samaan, C. M. (2021). Antibullying interventions for autistics: A systematic

review. *American Journal of Occupational Therapy.* DOI: 10.5014/ajot.2021.75S2-

RP364

Ota, A. (2004). Reliability study of the Japanese Sensory Inventory Revised (JSI-R). *Japanese

Journal of Sensory Integration Dysfunction, 10*, 49–54.

Parham, L. D., Ecker, C. L., Kuhaneck, H., Henry, D. A., & Glennon T. J. (2021). *Sensory

Processing Measure (SPM-2) manual.* Western Psychological Services.

Schoen, S. A., Miller, L. J., & Sullivan, J. C. (2014). Measurement in sensory modulation: the

Sensory Processing Scale Assessment. *The American Journal of Occupational Therapy,

68(5),* 522–530. doi: 10.5014/ajot.2014.012377.

Spark PE. (n.d.). *Spark PE*. Retrieved March 27, 2022, from https://sparkpe.org/

Talay-Ongan, A., & Wood, K. (2000). Unusual sensory sensitivities in autism: A possible
crossroads. *International Journal of Disability, Development and Education, 47(2),* 201–
212. doi:10.1080/ 713671112

Tanner, K. (2018). Interventions for improving social skills and social participation for
individuals with ASD. In R. Watling & S. L. Spitzer (Eds.), *Autism across the lifespan A
comprehensive occupational therapy approach* (pp. 405-414). The American
Occupational Therapy Association.

Tavassoli, T., Hoekstra, R. A., & Baron-Cohen, S. (2014). The Sensory Perception Quotient
(SPQ): Development and validation of a new sensory questionnaire for adults with and
without autism. *Molecular Autism, 5(29),* 1–10. doi:10.1186/2040-2392-5-29.

Ttofi, M. M., & Farrington, D. P. (2011). Effectiveness of school-based programs to reduce
bullying: a systematic and meta-analytic review. *Journal of Experimental Criminology,
7(1),* 27–56. https://doi.org/10.1007/s11292-010-9109-1

Tomchek, S., & Koenig, K. P. (2016). *Occupational therapy practice guidelines for individuals
with autism spectrum disorder.* AOTA Press.

Weaver, L. L. (2015). Effectiveness of work, activities of daily living, education, and sleep
interventions for people with autism spectrum disorder: A systematic review. *American
Journal of Occupational Therapy, 69.* http://dx.doi.org/10.5014/ajot.2015.017962

Weaver L. L. (2018). Participation in ADLs for individuals with ASD. In R. Watling & S. L.
Spitzer (Eds.), *Autism across the lifespan A comprehensive occupational therapy
approach* (pp. 269-285). The American Occupational Therapy Association.

Williams, M.S., & Shellenberger, S. (1996). *"How Does Your Engine Run?"® A leader's guide to the Alert Program® for self-regulation.* TherapyWorks, Inc.

Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharzyk, S., Brock, M. E., Plavnick, J. B., Fleury, V. P., & Schultz, T. R. (2015). Evidence-Based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders, 45,* 1951-1966. https://doi.org/10.1007/s10803-014-2351-z