

8-2017

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Teaching Children with Autism Spectrum Disorder Using Evidence Based Practices

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### Abstract

Each child that has been diagnosed with autism spectrum disorder (ASD) is different. However, they have similar characteristics in that they lack communication, social, and adaptive skills. As well as reduced cognitive functioning and gross motor skills. This literature review will look at some of the evidence-based practices for teaching children who have been diagnosed with autism spectrum disorder. It provides information on how to implement them in the early childhood classroom, and focuses on how each practice allows the teacher to adapt it to the student with ASD in one's classroom. It is important that trainings are offered for teachers and paraprofessionals on evidence-based best practices for teaching children with autism spectrum disorder, and that there continues to be active research so practices can become evidence based.

### Teaching Children with Autism Spectrum Disorder

Walk into an early childhood classroom and one will find a room filled with diverse learners. Among those diverse learners may be a child who has been diagnosed with autism spectrum disorder (ASD). Currently, 1 in 68 school age children in the United States have autism spectrum disorder. ASD occurs in all ethnicity and socioeconomic groups, but is five times more common in boys than girls. Since it is one of the fastest growing disability categories receiving special education, it is important for teachers to know the best practices and to use evidence-based practices for teaching children with ASD (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017).

Teachers and paraprofessionals feel that they lack the knowledge or training to teach students who have been diagnosed with ASD. In autism research there is a trend of a gap between research and practice. Schools and teachers do not utilize the evidence-based practices because of the belief that the research settings are not similar to the children in the teacher's classroom settings. While something works great in a controlled environment, it does not always seem to go as smoothly in the classroom. This literature review will discuss evidence based practices that teachers can use to focus on specific skills one is working on in the early childhood classroom. Video modeling, visual cues, and pivotal response training are all interventions further explored in this review, with a focus on play skill interventions.

### **Literature Review**

The following interventions have been identified as evidence-based strategies for effectively teaching play to young children with ASD: video modeling, visual supports, and pivotal response training (Carrero, Lewis, Zolkoski, & Lusk, 2014). A common thread of these

interventions is that they involve the teacher teaching specific skills to the child with ASD and working on the child to master those skills. Information is provided on how to successfully implement some interventions for social and play skills in one's specific classroom setting. These interventions are easily adaptable to the classroom setting for teachers. The interventions reviewed are also interventions that can be performed not only by the teacher in the classroom but by any adult in the classroom. Teachers and other adults working with students with ASD will gain information on how to implement different interventions in the classroom. "With careful planning and consideration by the teacher, a young child with autism can have a successful school experience" (Deris & Di Carlo, 2013, p. 56).

### **Video Modeling**

An evidence-based practice that has been reported by the National Autism Center (NAC) in the US in 2009 is video modeling (Acar & Diken, 2012). Video modeling allows the teacher to target a specific skill or behavior for a specific child in one's classroom. It can be done to work on a variety of skills or behaviors such as play skills, social skills, academic skills, life skills, and conversation skills (Kim, 2016). For example, video modeling may be done to help the student with ASD learn how to walk down the hall correctly when transitioning. It may also be done to prime the student with ASD for a fire drill. In video modeling, a person is video recorded doing the targeted behavior or skill that one wants the student to perform. The person performing the skill in the video may be an adult or peer of the student. Using peers that are familiar to the student with ASD may help increase one's attention to the video and as a result have a more positive affect (Kourassanis, Jones, & Fienup, 2015). The student themselves may also be videoed doing the targeted behavior, which is known as video self-modeling (Carrero,

Lewis, Zolkoski, & Lusk, 2014). The student then can watch the video of the desired behavior or skill being targeted at any time.

In the article, *Reviewing Instructional Studies Conducted by Using Video Modeling to Children with Autism*, 31 video modeling studies were reviewed. Thirteen out of the 31 studies being reviewed used only video modeling to teach social skills, play skills, perspective talking skills and imitation skills to children with ASD between the ages of two and fifteen. Video self-modeling was only used in three out of the 31 videos to teach social skills to children with ASD between the ages of three and eleven. The other studies included video modeling and other practices being used together to teach 20 children with ASD between the ages of three and thirteen. Items taught were activity schedules, identifying emotions, perspective taking skills, and language and social skills. After Acar and Diken (2012), reviewed the 31 studies they determined that video modeling was an effective tool to use to teach social skills, play skills, language and communication skills, functional skills, self-care skills, and daily life skills and behaviors to children between the ages of 3 and 11 with ASD.

Benefits of video-modeling include that students with ASD can watch the video multiple times, which can be a natural reinforcement to motivate the student. Since the child is able to watch it repeatedly it helps with learning and retention. It is convenient, because an individual may not always be available to live model for the student (Acar & Diken, 2012). External stimuli is decreased when video modeling, which allows the child with ASD to focus more and gives them less distractions (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017). Video modeling can also allow the teacher to be working with multiple students at a time. The student with ASD can be watching the video independently, while the teacher works with other students in the classroom. A trait of children with ASD is that they often prefer and respond to learning

visually, and without face-to-face communication; video modeling allows the student to learn in this way. Many students with ASD lack social skills and video modeling takes that out of learning the skill (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017). Video modeling also allows the teacher to speak at the language level that child is at when working on specific goals in an authentic setting.

In the early childhood classroom, video modeling can be used to teach physical exercises to promote healthy living in children with ASD. A trait of children with ASD is a delay in motor development. Research has shown that a way to support physical and gross motor development to help improve the quality of life for children with ASD is learning exercises and childhood games through video modeling (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017). Children with ASD often do not exercise at the same level or frequency as their developing peers, so they can be at a higher risk for cardiovascular, metabolic, and pulmonary diseases. The participants in the study done by Bittner, Rigby, Silliman-French, Nicholas, and Dillion (2017), included six children with ASD between the ages of 5 and 10. They compared children using the ExerciseBuddy application (EB app) versus practice style teaching. Often times when teaching students motor skills, the teacher gives a demonstration and description of the task and then the students practice it and receive feedback. This type of instruction, known as practice-style instruction, may make it difficult for a children with ASD to follow along and be involved (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017). The EB app uses evidence based practice of video modeling for 180 exercises. The EB app or video modeling would allow the child to focus on the task having more times to watch it visually and without extra stimuli.

According to the article, *Use of technology to facilitate physical activity in children with autism spectrum disorders: A pilot study*, the use of the EB app or video modeling can be a great

tool for improving physical activity in children with ASD, which may lead to a better quality of health for the child (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017). While performing locomotor skills, the EB app allowed for a greater peak energy expenditure and heart rate response compared to practice-style teaching. These bouts of moderate to vigorous exercise can lead to better physical health which may help decrease obesity and other chronic disease later in life. The EB app also allows adults, who are unfamiliar or do not have a background with teaching physical exercise to students, a way to communicate appropriate exercise instruction (Bittner, Rigby, Silliman-French, Nicholas, & Dillion, 2017).

In a study done by Kourassanis, Jones, and Fienup (2014), two children with ASD were taught to engage in the social games of “Duck Duck Goose” and the “Hokey Pokey” through video modeling. This was done in a small group setting where the two children with ASD watched the video models together and then played the games together with another peer. The two children in the study had both been diagnosed with ASD, used multi-word sentences, could follow simple one to two step commands, and did not engage in group activities that involved chained gross motor behavior. During the baseline, the first child performed the skills on the task analysis for “Duck Duck Goose” at a range of 17-25%. Next, the child was able to watch the video model of five children playing “Duck Duck Goose” and after seven sessions was able to perform the skills at 100%. For the “Hokey Pokey” his baseline was 20% and after video modeling intervention increased to 100% in five sessions. The other child started at baseline score that ranged from 0-8% for “Duck Duck Goose” and reached 100% after eight sessions of video modeling. For the “Hokey Pokey” her baseline was 0-5% and reached 95% after six sessions of video modeling. The authors of this study also included a generalization game of “Ring Around the Rosey” to see if the acquisition of the chained behaviors from “Duck Duck

Goose” and “Hokey Pokey” would occur outside of the trained stimuli. The two children did not watch a video model of this game. During the baseline for “Ring Around the Rosey” one participant scored 50% for his baseline, and it only rose to 60% after the intervention. Participant number two was able to perform 20% of the task analysis during her baseline, and 50% after her intervention. These results support that peer modeling is an effective way to teach students with ASD chained social games (Kourassanis, Jones, & Fienup, 2015).

Social relationships are a crucial part of a child’s life growing up. Children with ASD often lack in social skills and struggle with developing friendships with their peers which can lead to poor school adjustment (Kasari, et al., 2016). The lack in social skills in children with ASD make it difficult for the child to engage in normal play with one’s peers (Carrero, Lewis, Zolkoski, & Lusk, 2014). In an early child-hood classroom it is essential that teachers help children with ASD learn to play with one’s peers. A teacher must prepare peers and the setting to give students with ASD the best opportunity to have successful play interactions. When a teacher sets up the setting for play interactions one can accommodate for the student with ASD. A teacher can have manipulatives or toys that are of interest to the student with ASD, take in account the student’s developmental level, and any history of successful learning experiences for that particular student (Carrero, Lewis, Zolkoski, & Lusk, 2014).

Carrero, Lewis, Zolkowski, and Lusk (2014) suggest that children with ASD do not naturally develop social skills through exposure to typical-developing peers. When teachers do not allow the child with ASD to practice play situations it can lead to a continuing cycle of peer rejection and isolation for the student. Children with ASD who are given opportunities to engage in play may lead to increase engagement in inclusive environments (Carrero, Lewis, Zolkoski, & Lusk, 2014). Social skills are important for children with ASD to learn, because social skills are

a catalyst for learning other skills. While having social interactions children with ASD are working on language development, perspective taking, and cooperation (Kourassanis, Jones, & Fienup, 2015). Two articles, *Research-Based Strategies for Teaching Play Skills to Children With Autism* and *Peer-video modeling: teaching chained social game behaviors to children with ASD*, suggest that just giving children with ASD time to play with typical-developing peers in an inclusive setting does not benefit the student with ASD and interventions that demonstrate social skills need to be implemented for students with ASD (Carrero, Lewis, Zolkoski, & Lusk, 2014) and (Kourassanis, Jones, & Fienup, 2015). There was no action research done, to back up this information in either article, so one would suggest that more research needs to be done on this topic.

In the study done by Kasari, et al., (2016) it researched if “working in small groups with typical peers and the child with ASD from their class versus a small group of all children with ASD from different classes would be more effective in improving peer acceptance and engagement” (Kasari, et al., 2016, p. 172). Results showed that students with ASD who were grouped together and received training on specific social skills showed a significantly improved social network versus the student with ASD who was grouped with their peers without training on specific social skills.

A teacher can implement video modeling for a play intervention by following the steps provided by Carrero, Lewis, Zolkowski, and Lusk (2014). In teaching play to students with ASD teachers will use both audio and visual cues during video modeling. The first step is for the teacher to determine the play sequence one wants the student to learn. Then the teacher needs to select toys to use. It is best if the teacher selects toys one knows the student has shown a high interest in. Next, typically developing peers are recorded acting out a play scenario that includes

the skills or behaviors the teacher has identified as the goal. When video modeling play scenarios, be sure to keep the camera at eye level so the student will be seeing exactly what he or she will see when engaging in play. In order that the student with ASD does not rote memorize the scenario, it is important to record the situation from three different angles with three different verbalizations. After the student with ASD has been able to view the video multiple times, a peer approaches the student with toys and gives the student with ASD the verbal cue that was used in the video modeling. Peers and teachers should continue to prompt the student the same way, and reward the student when skills are demonstrated correctly or in the correct sequence. As the student continually demonstrates the skill, these prompts and rewards can decrease and fade out (Carrero, Lewis, Zolkoski, & Lusk, 2014).

### **Visual Supports**

Visual supports are another evidence-based practice to teaching students with ASD. One type of visual support is social stories. Social stories “present concepts and situations in a visual format that may increase understanding for students with ASD” (Hume, Sreckovic, Snyder, & Carnahan, 2014, p. 37). A situation is described in social stories demonstrating the desired behaviors and responses while identifying common social cues (Hume, Sreckovic, Snyder, & Carnahan, 2014). Social stories are usually read aloud to the student before the situation or transition occurs. They can be created to help students with ASD learn behavior expectations for unplanned events or events out of the normal routine (Deris & Di Carlo, 2013). A social story can be created for just about anything the teacher may need such as attending mass, fire and tornado drills, or even when a student will be transitioning to a new teacher. Social stories could be created with visual cues that walk through the play behavior sequence. Teachers may shy away from visual supports, because it can be time consuming and requires one-on-one teaching.

Teachers should be able to find social stories already created that would be beneficial to the student with ASD in one's classroom if one did not want to make one's own. It is very beneficial though because with this evidence-based practice it allows teachers to focus on the specific needs of the student with ASD in the classroom and is done in an authentic setting. Teachers can have a paraprofessional or another adult take the pictures that one needs for an authentic social story. Stories can be created before the situation, which is ideal, however, on the first day of school is a great time to take pictures so one has authentic pictures to use for visual cues and social stories.

Visual cues helps make the situation more predictable for students with ASD if one uses the cues for priming the student. Priming is giving the student visual cues of what is going to happen before the situation occurs (Hume, Sreckovic, Snyder, & Carnahan, 2014). Teachers can use a visual cue for a predictable schedule of the day. The schedule should include authentic pictures, eye level of the child, and referred back to often to help the student with ASD know what is coming next. This will help with the student's anxiety level (Deris & Di Carlo, 2013). Visual cues can be used for a variety of things, such as the routine in the bathroom, how to line up in the classroom, or for the sequence of color, cut, glue for a project. Visual cues can be put in sequential order on a paint stick or craft stick with velcro. Having the velcro on the back of the pictures allows the student to remove the visual cue when the task has been completed. These pictures can be taken by another adult, to help the teacher save time. A teacher may choose to use authentic pictures of the student and items, or could use clip-art for pictures. It is important that if the student is in multiple classrooms throughout the day that visual cues are consistent, when applicable, for the student to know the routine. Visual cues and social stories can also be passed on from teacher to teacher each year, to help with consistency for the student.

The steps provided by Carrero, Lewis, Zolkowski, and Lusk (2014) for visual supports is to take a picture of each step of the play sequence, and then walk through each picture with the student. One play behavior is represented in each picture, and it is taught one at a time. Modeling and verbal cues are used to teach the behavior represented in the picture. Again, reward the student when a correct response is given. After each behavior has been mastered, then the teacher can begin linking 2-3 pictures and working with the student to master the sequence. An assessment that can be used is to have the student put the picture cues in order. Once the student has shown mastery of the play skills, include a peer in the play situations. The peer should give the student reinforcement when the student gives the correct response. Lastly, in each center picture cues should be put up so that the student with ASD has visual cues on how to correctly play with the materials.

### **Pivotal Response Training**

The next evidence-based practice to use for teaching children play skills is pivotal response training (PRT). PRT uses the student's interest and initiative to teach behaviors that affect a wide range of skills. When students with ASD are provided materials that are interesting to them, they are more motivated to learn (Deris & Di Carlo, 2013). PRT is beneficial for teaching students with ASD on appropriate peer interactions during play, such as taking turns and initiating and responding verbally (Carrero, Lewis, Zolkoski, & Lusk, 2014). It is also successful for showing a student with ASD how to play with the toys correctly. Research also has shown that PRT can increase motivation of the student with ASD and the student's with ASD language skills (Lindergren & Doobay, May 2011). PRT is beneficial to teachers because it is done in an authentic settings, based on the specific student's interest and goals. It is also considered cost and time efficient. Teachers and paraprofessionals can lead this intervention.

Carrero, Lewis, Zolkowski, and Lusk (2014) give the following information for how to successfully implement PRT as a play intervention in the classroom. For a teacher or paraprofessional to implement PRT, one must first provide a clear and uninterrupted instructions for completing the tasks. If the student with ASD attempts to complete the task, an immediate reward or reinforce should be given to the student. Rewards could consist of if a student walks over to a toy, the teacher or paraprofessional immediately goes to the toy and starts playing with the student with it. If the student's goal is to work on motor skills of opening a container, inside the container is something the student really likes, such as a piece of candy or toy. The idea is that the rewards will motivate the student to keep working on the activity. As the student with ASD becomes a master at the skill, the rewards are phased out.

### **Conclusion**

Parents and teachers were able to successfully implement evidence-based interventions when provided the necessary training. Teachers that attended a preparation program on evidence-based practices for children with ASD, were able to master multiple skills in short amount of time (Lerman, Vorndran, Addison, & Kuhn, 2004). In research done by Besler and Kurt (2016) mothers of children with ASD received two, three hour trainings on video modeling and then were able to create a video model with 100% accuracy. A majority of early childhood teachers feel unprepared when it comes to teaching the diverse population found in many early childhood classrooms (Wilson, Dykstra, Watson, Boyd, & Crais, 2012). It is important that teachers, paraprofessionals, and leaders receive the professional development time and training on using evidence-based practices for teaching students with ASD.

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