

Students with Autism and How They Navigate
the Social Environment through Visual Prompts

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Abstract

Strategies for teaching children with autism, specifically using visual cues, were reviewed. Children with autism display impaired social skills and language delays. The research begins by discussing how studies have shown that children with autism are more successful with visual processing rather than auditory processing. It then continues by comparing two research-based methods for teaching children with autism; namely, discrete trial training and pivotal response training. Lastly, it takes an in-depth look at visual prompts and how visual prompts assist children with autism with communication and language, social skills, independence, and organizational skills. The research examines a few studies, which demonstrate the success of visual prompts in increasing appropriate behavior and decreasing inappropriate behavior.

Keywords: autism, visually cued instruction, social stories, applied behavior analysis, discrete trial, pivotal response training

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A goal in the educational setting for students with autism is for these individuals to possess the ability to independently and successfully complete tasks. Much of the guidance and directing given in the school environment is done through verbal prompting. People with autism have difficulty listening to multiple step instructions that can lead to frustration and failure in the school setting. It is also difficult for people to generalize and exhibit items taught in the school setting spontaneously. Visual cues help students with autism gain independence from teachers and promote generalization and maintenance of skills acquired (MacDuff, Krantz, & McClannahan, 1993). There are some research-based methods for working with children diagnosed with autism. These methods include discrete trial training and pivotal response training. These methods, when combined with visual stimuli, help children with autism gain progress in academics, social skills, and functional routines.

Autism

Because autism is a developmental disability, it has a profound influence on the verbal and non-verbal communication and social interaction of an individual. A child who has been diagnosed with autism could have difficulty understanding facial features. As a result, this individual probably will have many impediments when he is involved in any type of social interplay. Other hallmarks often seen with this condition relate to one's engagement in repetitive activities and stereotypic movements, a resistance to changes in a youngster's surroundings or in his daily routines, and unusual responses to sensory experience. A case in point: A child might see a toy car but instead of having with it like the

average child, s/he might continuously whirl the wheel. Because autism is a spectrum disorder, the symptoms and characteristics of this disorder can be displayed in a wide variety of combinations, from mild to severe. Although autism is defined by a certain set of behaviors, children and adults usually are troubled by a wide range of these behaviors and any combination of the behaviors in varying gradations of severity. Two children, both with the same diagnosis, can display differing behaviors patterns and have skill levels that vary significantly (Cashin, & Barker, 2009).

Processing

Auditory processing is difficult for children with autism, and children with autism excel more with visual-spatial information. As a result of many trials, one can conclude that children with autism achieve higher results on visual-spatial tasks that depend on simultaneous processing capabilities than they do on social or language reasoning assignments, which dictate sequential processing (Quill, 1997). Lengthy sequences are troubling for students with autism and this is why it is necessary for information to be broken into small chunks for learning (MacDuff, Krantz, & McClannahan, 1993). Children with autism succeed on assignments that remain visible at all times. Social cues are formidable for students with autism, and social stories assist in easing the process of accurately making sense of interactions. Social stories consist of four to six sentences which detail genuine information concerning a social situation, possible responses of others in that particular set of circumstances, and instructional statements of suitable or hoped for social responses (Thiemann & Goldstein, 2001).

Instructional Strategies

Applied Behavior Analysis

Applied Behavior Analysis (ABA) has proven to be a strong teaching method in meeting the needs of children with autism. ABA is, “A scientific approach to working with a range of clinical, educational, and social problems, and is based on several decades of research in the psychology of learning” (Grindle, et. al, 2009, p.65). ABA has also been used in incidental teaching which gets learners with autism involved after the child has shown interest in an item (Weiss, 2005). When using ABA, the focus is to teach learners with autism to obtain appropriate and useful behaviors by learning new repertoires of behavior. It is also necessary to reinforce the actions of learners in using appropriate behavior and in not reinforcing their behaviors when using inappropriate behavior. Some of the skills that are considered in forming correct response are attention, communication, social skills, academics, and self-help skills. There are some important factors in using ABA to teach children with autism appropriate skills. These components include the use of rewards, task analysis, discrete trial teaching, generalization, functional behavior assessment, data driven teaching and learning, and high quality training and supervision (Grindle, et. al, 2009).

Discrete trial training. Discrete trial training is used in a very structured and routine format. Discrete trial training occurs when skills are taught in a meaningful sequence and when they build upon skills all ready learned. Concepts that are taught are then broken down into smaller chunks. Each trial takes approximately up to 25 seconds. Discrete trials are generally taught in a 1:1 setting in the following 4-step sequence: (a) instructional cue, (b) child response, (c) consequence, and (d) pause (Arick, Loos,, Falco, & Krug, 2005). The instructional cue consists of a teacher asking the student a question such as, “What is this?” when presenting the student with an object or flashcard. The child will then give a response. Depending on whether the response is correct or incorrect

determines the consequence. If the child gives the correct response, the child will get a reward whether it be verbal praise, a tangible item for a few seconds, or an edible item. If the answer is incorrect the teacher will prompt the child to give the correct answer but the prompt will be faded out when it is not needed anymore. The child would not receive the reinforcement. A brief pause would then take place and a new trial would begin. Discrete trial is used to teach new behaviors, discriminating skills, receptive, and expressive language (Smith, 2001).

Pivotal response training. Pivotal Response Training (PRT) is a naturalistic or incidental approach to teaching children with autism to use play and communication skills. PRT is also based on the 4-step sequence; cue, child response, consequence and pause. The difference with PRT is that it is embedded into the child's environment. During PRT a child chooses an item of interest and when the teacher works with the child, that item becomes a natural reinforcer (Arick, Loos, Falco, & Krug, 2005).

PRT has been shown to improve the skills involved in playing in children with autism at different age and developmental levels. For example, as written in the article by Stahmer (1999), there are rules outlined in using PRT to facilitate play. First, the activity that is chosen is simply explained to the child. If the child has finished with a specific item and would like to choose another item, the teacher would model the statement for the child. Second, more than one skill can be worked on with the child. As the child begins to advance in play skills, playing with the item appropriately and interacting with the teacher would be worked on. Another important guideline is it is always the child's choice to choose the specific item with which s/he will play. Since the child is able to choose the activity or item that with which s/he will be engaging, he is receiving direct reinforcement.

For example, if the child chooses to play with a train, the teacher might first have the child move the train around the train track and after the child completes that task, he has a moment to engage as he would like with the toy. Lastly, reinforcement is given to the child if an approximation to the correct response is given (Stahmer, 1999).

Visually Cued Instruction

Visually cued instruction is defined as, “The use of graphic cues (pictographs and/or written words) as either an instructional prompt to aid language comprehension and communication, or an environmental prompt to aid organizational skills and improved self-management” (Quill, 1997, p. 704). Prompts such as verbal, physical, and gestural are often accompanied with visual cues. Steege, Wacker, and McMahon (1987) discovered that teaching a six-step least-to-most constrictive prompt sequence in which the students always obtained informative suggestions in the same hierarchical order worked quite well. A modification that involved introducing a level of prompting for a task, and included a continuous appraisal of the students’ achievement had been previously adequate eliciting a reply equally successful.

Using visually cued instruction holds the attention of students with autism. Students with autism struggle with communicating with others. Language is prompted by visual cues, and students who are non-verbal often benefit through the use of graphic picture icons. These picture symbols provide the means for the students’ interchange of ideas. These picture representations provide the foundation of language for these students (Quill, 1997).

Observable cues also assist in the structuring and self-determination of students with autism. Illustrative schedules and visual tasks steps help promote self-reliance and make

students less needful of adult assistance. Graphic schedules not only arrange a student's day but they also aid in developing a daily procedure and preparing students for an unforeseen variation that might occur (Quill, 1997).

Illustrations and/or written words of guidelines and suitable behavior encourage students to have an understanding of expectations. It also helps in instructing a student when unsuitable conduct does occur. Visual cues aid students with autism in language development, social interaction, and self-control in the daily procedures of a school day. It is essential that visual cues be regularly applied on an everyday basis (Quill, 1997).

Using Visuals to Teach

Picture sequences. Visual prompts have been used to teach children with autism new skills. Visual picture prompts have been employed in the home setting to create independence among children. One study done by Pierce and Schreibman (1994) showed the efficiency of using pictures in teaching and maintaining daily living skills.

For example, Pierce and Schreibman did a task analysis of an activity such as getting dressed by taking pictures of each step and placing them in order in a photo book. At the end of the pictures was a smiley face sticker that offers reinforcement for the child in finishing the task. This process was taught to students in three phases. In the first phases students were taught to identify each picture. This was done by displaying three pictures and telling the student to "point to the drawer". Once students were able to identify all pictures with 100% accuracy, phase two was started. In phase two children were taught to choose a reinforcer, perform the task on each page, turn the page, and when they were finished self-reinforce. Successive approximations and delayed prompting of completing steps of the task was reinforced (Steege, Wacker, & McMahon, 1987). When the children

had mastered this phase with 100% accuracy, the third phase was begun. The third phase consisted of the fading of the therapist. The therapist began by praising the child for working on the task and then told the child that he would return in a minute. The amount of time the therapist left would increase until the therapist was no longer present and the child performed the task accurately for three consecutive trials (Pierce & Schreibman, 1994). After proper implementation of this treatment they found increased engagement in daily living skills and showed decreased inappropriate behavior.

Another study by MacDuff, Krantz, and McClannahan (1993) analyzed graphic schedules using varying amounts of assistance throughout teaching the chain of events of the activity and how it was learned, maintained, and generalized throughout different settings in their group home. This study was accomplished by giving each child a graphic schedule of activities in a three ring binder, such as completing handwriting worksheets, and then going to get a snack. Prior to the study students were able to identify picture-object associations.

First, the child was given the instruction to get his graphic schedule. If this did not happen, the instructor prompted the child with the appropriate amount of assistance. This process continued through each step of the tasks in the schedule. Prompts were faded as quickly as possible so that each task was finished on schedule. Once the child had shown to be on-task with completing the activities for at least 80% of the time, the teacher began fading prompting (MacDuff, Krantz & McClannahan, 1993). This phase of helping the child continued until the child was able to complete the tasks for at least 80% of the time for five consecutive trials. This study showed that with teaching the children how to use a picture schedule, being on-task and on-scheduled increased for all of the children .

Krantz, MacDuff, and McClannahan (1993) performed another study teaching parents to use photographic activity schedules for their children with autism in the home. Before the study began children were taught by the teacher to follow the graphic schedule. Baseline data was taken with parents using their own strategies to help their children. After this initial data a clinician came in and trained parents to teach their children to use a graphic schedule in the home. Results indicated that there was an increase in engaging in the activities and a decrease in inappropriate behaviors.

Social stories. Thiemann and Howard (2001) looked at using a variety of visual cues with children with autism in an elementary school and how it impacted their social communication. Normal developing peers were used to have conversations with the peers with autism. This study was presented with groups of three, including one of the children with autism and two typically developing peers. The research was specifically looking at the skills: contingent responses, securing attention, initiating comments, and initiating requests.

During the session the student with autism was given a 10-minute social skills instruction. This was conducted using a social story. The student was then asked five questions based on the story, and once s/he was able to reply with 75% to 80% accuracy a task was presented. The task which was 10-minutes in length was to be completed with the typically developing peers. The teacher stepped back, watching for the child to use the social skills that were just learned. If the child was not using the skill, the teacher gave a visual prompt to the child. After this 10-minute period, the children watched a video of their social interactions looking for the social skills on which they were focusing. They then discussed the occasions on which they saw each other using the social skills. Results

showed that being taught a social skill, performing the activity with typically developing peers, watching a video of the activity, and then discussing improved the child with autism to being more stable with social skills (Thiemann & Goldstein, 2001).

Interview

Jason Marshall, MA, BCBA (personal communication, April 20, 2010), professor at California State University, Fresno and an autism specialist for Fresno Unified discussed the importance of employing visuals when teaching children with autism. Visuals encourage these students to successfully navigate his/her environment at school. Visual aids also help students in promoting independence, communication, and in developing social skills. These students are able to use his/her visual prompts to navigate daily routines and also in helping manage time in order to complete activities successfully. For example, when managing time, a student might look at a visual timer to help remind him by what time the work needs to be finished.

Many children with autism have echolalia. Echolalia is when the person repeats what is vocalized instead of having spontaneous language. Visual prompts leads to less verbal prompting, which in turn leads to less echolalia from the children. Visual prompting leads to more independence and self-management for children with autism (Jason Marshall, MA, BCBA, personal communication, April 20, 2010).

Visual prompting is useful as a teaching tool for individuals of all skill levels. It is important that the visual aid being employed corresponds to the functional level of the child. For example, a child who is at a very low functioning level would benefit from photographic representations; whereas a child who is higher functioning would be able to benefit from more abstract symbols or written words.

It is important for an instructor to be consistent when using visual prompts and fade visual prompts. These must be utilized at an appropriate time to ensure that students do not become dependent on the visual prompts. Fading out a visual prompt can be achieved by removing one picture, symbol, or word of the sequence of prompts in order for children to perform the skills being taught without the visual reminder in front of them. Once a child is successful when part of the visual prompt is taken away, another piece can be removed. Eventually, the student will be performing the task independently with no visual prompts. When teaching these skills, it is also very important to have the child on a reinforcement schedule. It is imperative for the child to be reinforced for using visual prompting.

It is also important for teachers, parents, and caretakers to undergo appropriate training on using visual prompting and on when to fade visual prompting. If the teacher does not fade a visual prompt, the child can become dependent on the prompt and begin to see the prompt as a reinforcing item, which will make it very difficult to fade in the future. When visual prompts are implemented appropriately, one will see many gains made in the child (Jason Marshall, MA, BCBA, personal communication, April 20, 2010).

Conclusion

The overall findings of the research presented indicate that there are many programs available to engage students with autism in his school environment. The implementation of this curricula will go a long way towards creating a positive learning experience. Visual stimuli alone can help in the structure, routine, and communication of children with autism in promoting independence. One can observe from the previous

research on discrete trial training and pivotal response training, that when these instructional strategies are paired with visual stimuli, there has been much success.

According to the positive research on visual stimuli, discrete trial training, and pivotal response training in children with autism it can be concluded that a classroom that incorporates all of these teaching strategies will benefit from improved communication, social skills, and academics among the students in the classroom. Another component that is emphasized in all the research material is the use of positive reinforcement in learning. This positive reinforcement can range from verbal praise, a high five, a tangible item, to an edible item. The positive reinforcement keeps the children motivated to continue learning.

Quill (1997) discussed how visual stimuli such as visually cued instruction can be used in many different settings. As shown in the research by Pierce and Schriebman (1994), when pictures for teaching and maintaining daily living skills were consistently implemented, all children were then able to complete daily living tasks that were given to them in various settings independently. Also, shown in the research by MacDuff, Krantz, and McClannahan (1993) that children with autism in a group home learned different recreational and home-living tasks by using a photographic activity schedule. Thiemann and Howard (2001) also proved the usefulness of visual stimuli by using social stories and video feedback about appropriate social interactions with his/her typical developing peers at school. The research in these studies has shown that when learning skills is accompanied by visual stimuli in the home environment, success is achieved. Further research using visual stimuli in various activities and settings within the school environment could further validate the importance of visual stimuli in the learning of students with autism.

Visual stimuli have proven to have many benefits in the learning of new skills and behaviors in children with autism. Visible stimuli are a helping bridge, which enable students with autism to be more independent, and as skills are learned, visual prompts can be faded. Prompting is necessary when teaching children with autism. It is important that children learn skills correctly, and visual prompting helps this process.

As shown by the previous research, when appropriate ABA methods are used and visual stimuli are present, students with autism are successful at learning. Social stories, picture sequences, and visual cue cards all enrich the life of these students. As mentioned earlier, it is necessary that all instructional strategies for teaching children with autism are implemented correctly. With the application of consistency, correct implementation, and visual stimuli children with autism will experience much more meaningful, complete, and happy lives.

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