

## EFFECTIVE INTERVENTIONS FOR INDIVIDUALS WITH HIGH-FUNCTIONAL AUTISM

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*The diagnosis of high functioning autism (HFA) is not the end of comprehensive assessments. Since the 1970s, although a great deal of research has focused on developing effective educational approaches and interventions for children with autism, there is an increasing need to develop differentially effective educational approaches or interventions that are specifically for children with HFA. This paper reviews several effective, evidence based interventions that are widely used by special educators and professionals as best practices in the United States, including structured teaching approaches, peer-mediated interventions, self-monitoring or self-management strategies, video modeling, and social stories, with a hope that people in other places of the world can also find these interventions beneficial in teaching children with HFA.*

*A lack of learning in any particular situation should first be interpreted as a result of the inappropriate or insufficient use of teaching strategy rather than an inability on the part of the learner (Gold, 1980, p. 15)*

Autism is a complex, behavior-defined developmental disorder. The diagnosis of high functioning autism (HFA) is not the end of comprehensive assessments. Having more up-to-date knowledge of this population including their characteristics, strengths, needs and interests is more important than simply a diagnosis (Kunce & Mesibov, 1998). Only with a better understanding of these individuals can researchers design more effective interventions to better serve their needs. This process requires on-going joint efforts of researchers from multiple disciplines.

Since the 1970s, researchers have made great effort to develop individualized educational programs and interventions, many of which have demonstrated their effectiveness in improving the social communication abilities and daily functioning skills of the autistic population. However, as it is evident in the available literature, most available publications are focused on children with moderate to severe autism, individuals with HFA are relatively underserved. There is an increasing need to develop differentially effective educational approaches or interventions that are specifically for children with HFA. Fortunately, research in this field in the past decade is on the rise. The following section will introduce several evidence-based, effective interventions that are widely used by special educators and professionals as best practices in the United States, including structured teaching approaches, peer-mediated interventions, self-monitoring or self-management strategies, video modeling, and social stories.

### *Structured Teaching Approaches*

Structured teaching approaches were originally developed by researchers from the TEACCH (Treatment and Education of Autistic & related Communication handicapped Children) program at the University of North Carolina, Chapel Hill. They are regarded as the most effective individualized teaching approaches implemented in classroom settings for students with autism and include such components as routines, schedules, adapted instructional strategies, and modification of learning environments (Kunce & Mesibov, 1998). Structure teaching approaches are effective because they make the classroom environments meaningful to the target children and make necessary environmental modification to better cater for their special needs (Kunce & Mesibov, 1998).

### *Routines & Schedules*

Individuals with HFA are basically visual learners. Unlike ordinary people, they tend to think in pictures and might not be able to follow verbal instruction, which actually work for most typical students. Even with relatively unimpaired language ability (compared to other children with moderate to severe functioning level autism), students with HFA might still *fail to adapt well in unmodified classroom environment because of pragmatic social communication difficulties as well as more general social impairments* (Kunce & Mesibov, 1998, p. 231). Students with autism tend to insist on sameness and also find lack of predictability stressing.

The use of routines and schedules can help students with HFA better adapt to classroom environment by establishing consistency and predictability (Kunce & Mesibov, 1998). Researchers in the TEACCH programs found the development of systematic routines lessen the feeling of anxious, decrease behavior problems and promote learning in students with HFA (Mesibov, Scholper, & Hearsey, 1994). Accordingly, the use of individualized schedules can help students with HFA *stay on track, understand, accept and follow the sequence of daily events* (Kunce & Mesibov, 1998, p. 234) and *adapt more flexibly and smoothly to the inevitable changes in the daily routine* (p. 236), as well as decrease transitional difficulty.

### *Adapted Instructional Strategies*

In addition to routines and schedules, adapted instructional strategies can help children with HFA better involve in classroom learning. Due to their unique characteristics, students with HFA cannot benefit from traditional teaching methods. Kunce and Mesibov (1998) suggested, to help students with HFA better understand instruction and requirements, teachers can apply the following adapted instructional strategies:

(1) Adjusting instructional language. Despite their relative strengths in vocabulary, reading ability and speaking skills, researchers found children with HFA actually have difficulty understanding complex sentences because of the pragmatic impairments (Minshew, Goldstein, & Siegel, 1995). Researchers suggested the use of simple languages and short sentences with slower speed can help clarify instruction and expectation to students with HFA (Kunce & Mesibov, 1998).

(2) Using written information. Basically, students with HFA are visual learners, so they cannot benefit from traditional verbal instruction. Based on their relative strengths in visual spatial processing, the use of written information may be one of the most effective ways to teach this population (Kunce & Mesibov, 1998). Visual aids, including written task directions, written cues, maps, pictures, handouts and checklists, provide the target students with *a lasting, visual reminder* and are more effective than instructional languages and other presentation styles (Kunce & Mesibov, 1998, p. 239)

(3) Taking advantage of the target student's special interests. Students with HFA usually have strong interests in some special objects or topics. Some researchers emphasized it is important to utilize their special interests to develop academic and career skills, rather than stamping them out (Siegel, Goldstein, & Minshew, 1996, p. 244). In addition, these special interests can be also used to *reinforce less preferred activities as well as to make the school environment more appealing* (Kunce & Mesibov, 1998, p. 245)

### *Modification of Learning Environments*

Besides the adapted instructional strategies, environmental modification is also essential (Kunce & Mesibov, 1998). Typically, students with HFA learn better in a structured environment. Researchers suggested when possible, arrange the learning materials and furniture in ways that accommodate the students' learning styles best and reduce potential distractions (Kunce & Mesibov, 1998). For example, offering preferential seating and providing an independent work area for students with autism are encouraged (Kunce & Mesibov, 1998). Another way to modify learning environments is to use organizational work system. For example, the use of containers with written labels is a simple but most effective way to organize tasks for students with HFA (Dalrymple, 1995; Kunce & Mesibov, 1998). Other organizational supports such as organizational notebooks and written task directions are also very helpful in promoting independence in students with HFA.

### Peer-mediated Intervention

The effects of peer-mediated interventions (PMI) have been well established in the literature and regarded as one of the most promising approaches to educating individuals with autism (Goldstein, Wickstrom, Hoyson, Jamieson, & Odom, 1988; Ostrosky, Kaiser, & Odom, 1993; Robertson, Green, Alper, Schloss, & Kohler, 2003). Peer-mediated interventions (also refers to as peer tutoring) can be divided in three levels: class wide, small group and one-to-one. Matching a child with disabilities with typically developing peer partner(s) has the following advantages:

- (1) providing a reciprocal and more learner-friendly environment (Perske, 1988);
- (2) presenting more opportunities to *receive positive and corrective feedback, individualized help and encouragement* (Maheady, Harper, & Mallette, 2001, p. 7);
- (3) students prefer peer-teaching practices to traditional student-teacher instruction (Maheady, Harper, & Mallette, 2001);
- (4) Typical peer is able to *make adaptations when interacting with peers at lower developmental levels*, which increases *the likelihood of successful interactions*(Ostrosky et al., 1993, p. 160);
- (5) facilitating generalization of the learned skills across settings and people (Ostrosky et al., 1993, p. 164);
- (6) typical peers may also benefit academically and/or socially from such peer interaction (Kamps et al., 1998).

Over the past two decades, many researchers devoted tirelessly to the exploration of more effective PMI for individuals with autism and a great volume of such studies can be found in the literature. They demonstrated the effectiveness of various PMI in facilitating both academic growth and positive social interaction between individuals with autism and their normal peers. For example, Kamps et al. (1994) examined the effects of class-wide peer tutoring on three children with HFA in an inclusive general education classroom and results revealed class-wide peer tutoring improved both the students' reading skills and social interaction. Another study by Goldstein et al. (1992) examined the effects of small group peer tutoring on social interaction between children with autism and their typical peers and results showed that 4 out of 5 target children demonstrated higher rates of social interaction. McGee et al. (1992) evaluated the effectiveness of another PMI (i.e., one to one peer incidental teaching) and found its effectiveness in promoting positive reciprocal interactions among children with autism and their typical peers.

Morrison, Kamps, Garcia and Parker (2001) used a multiple baseline design to determine the effects of an intervention package that combined peer mediation with monitoring strategies and found that the package increased the target children's rates of initiations and social interaction time with typical peers. Little difference between self-monitoring and peer-monitoring strategies was found. Similarly, Thiemann and Goldstein (2004) examined the effects of another intervention package consisted of peer training and written text cueing on

five elementary school students with autism and results also revealed improved child-peer interactions and social communication, as well as higher acceptance and friendship rating for children with autism.

When developing peer-mediated intervention, Ostrosky et al. (1993) suggested the best role for typical peers to play is to be *facilitator* rather than *primary interventionist* (p. 170). That is to say, peer-mediated interventions *should support the child's acquisition of social-communicative strategies by providing appropriate behavioral models, providing opportunities for successful communication, and facilitating generalization across environments and individuals* (Ostrosky et al., 1993, p. 170). They proposed the following criteria for selecting typical peers:

- (1) they demonstrate age-appropriate language and social skills;
- (2) they are familiar with the target participants, and interact positively with the target participants in the natural settings;
- (3) they would like to follow adult direction and are willing to help the disabled peers (Ostrosky et al., 1993). In addition, they also proposed the following seven principles to guide the development of an effective intervention (Ostrosky et al., 1993):

1. Promote peer interaction and facilitate communication between children with and without special needs.
2. Teach ALL children social-communicative strategies to maximize the effects of an intervention.
3. As initial participants, choose children who are likely to be successful.
4. Provide individualized instruction to children with special needs, focusing on initiation and response strategies.
5. Provide instruction to nondisabled children in conversational strategies known to elicit verbal and nonverbal behaviors from children with special needs.
6. A direct instruction approach should be used to teach desired social-communicative behavior to all children.
7. Maintenance and generalization must be programmed for (p. 170).

Effective peer-mediated intervention should be able to maintain the target child's joint attention (Ostrosky et al., 1993). To maximize treatment efficacy of PMI, the target child's preference, existing repertoires and strengths should be taken into consideration (Ostrosky et al., 1993). Environmental management is another important component of such intervention programs. Most individuals with autism learn better in distraction-free environments but have difficulty generalizing the acquired skills to more natural settings. To maximize generalization, Ostrosky et al. (1993) suggested multiple exemplars *should be trained to facilitate generalization to untrained stimulus conditions and to untrained responses* (p. 179). They also believed, *consistently providing children with structured and unstructured opportunities to interact with peers will facilitate generalization as children learn that there are expectations for positive social-communicative interaction between age-mates* (Ostrosky et al., 1993, p. 179).

#### Self Monitoring/Management Strategies

According to Field, Martin, Miller, Ward, & Wehmeyer (1998):

*Self-determination is a combination of skills, knowledge, and beliefs that enable a person to engage in goal-directed, self-regulated, autonomous behavior. An understanding of one's strengths and limitations together with a belief in oneself as capable and effective are essential to self-determination. When acting on the basis of these skills and attitudes, individuals have greater ability to take control of their lives and assume the role of successful adults* (p. 2).

As one way of self determination, self monitoring, which also refers to as self management, includes such strategies as self assessment, self regulation, self recording and self reinforcement (Koegel & Frea, 1993). Koegel, Koegel, and McNerney (2001) believed self

monitoring is a great technique with tremendous influence on the development of interventions for individuals with ASD. Its advantages include:

- (1) less intrusive: this technique requires the student to manage his/her own behaviors, rather than being controlled and managed by other people;
- (2) resource-saving: it demands less time and involves fewer resources such as professionals or educators, training and other instructional materials;
- (3) user-friendly: its procedures are simple and easy to master (Ganz & Sigafoos, 2005).

During the past two decades, self monitoring has been widely used as an effective intervention for children and adults with various disabilities. According to the literature, self management strategies can be applied to decrease undesirable, problematic behaviors in children and adults with mental retardation (Gardner, Clees, & Cole, 1983; Reese, Sherman, & Sheldon, 1984; Shapiro, McGonigle, & Ollendick, 1980), and to improve desirable behavior, social skills and play skills in children with autism (Koegel, Koegel, Hurly, & Frea, 1992; Stahmer & Schreibman, 1992), as well as to decrease inappropriate, stereotypic behavior in these individuals (Koegel & Frea, 1993; Koegel & Koegel, 1990).

Recently, Mancina, Tankersley, Kamps, Kravits, and Parrett (2000) reported they used a self-management treatment program and successfully reduced inappropriate vocalizations in a child with autism. In addition, Ganz and Sigafoos (2005) conducted a study to evaluate the effectiveness of a self-monitoring procedure in two young adults with autism and severe mental retardation in a vocational training program. Results showed that the use of self monitoring procedure increases the independent task completion and verbal requesting in these two individuals. Furthermore, other researchers (Agran, Sinclair, Alper, Cavin, Wehmeyer, & Hughes, 2005) also demonstrated that the application of self-monitoring strategy increase following-direction skills in 6 students with moderate to severe disabilities (including autism) in general education settings.

Since individuals with HFA have relative unimpaired intelligence and language, they are the best population to implement self-monitoring strategies and can achieve best outcomes. Researchers (i.e., Koegel, Koegel, & Carter, 1999) suggested if individuals with autism are taught and master the self-management technique, they might be able to generalize the skills to various settings and behaviors. Thus, the ultimate goal of self-monitoring strategies is to promote greater independence among individuals with HFA.

#### *Video Modeling*

Research has found that the use of video modeling (including self modeling and peer modeling) can have a great positive impact in the areas of social communication, daily functioning skills, and academic performance on children with various disabilities (e.g., Apple, Billingsley, & Schwartz, 2005; Charlop-Christy & Daneshvar, 2003; Goldstein & Thiemann, 2000; Simpson, Langone, & Ayres, 2004). Video modeling is effective because: (1) it focuses on the target children's visual strengthen (Pierce & Schreibman, 1994); (2) children with autism prefer to learn from video modeling to live, real world (or in-vivo) peer modeling (Charlop-Christy, Le, & Freeman, 2000). Over years, video modeling has been widely accepted as the best practice in the literature and can be used in many different ways (Sturme, 2003).

Video modeling can be used to teach social skills to children with autism. For example, Simpson, Langone, and Ayres (2004) used peer video modeling to teach three social skills to four children with autism and results showed that all students gained evident improvement in the targeted social skills in natural environments. Another study by Kimball et al. (2004) demonstrated the effectiveness of video modeling in teaching autistic children activity schedules. Furthermore, other researchers (e.g., Schreibman, Whalen, & Stahmer, 2000) used a technique named video priming and successfully decreased the disruptive behaviors during transition periods for children with autism.

In addition, video modeling can be also used to teach new daily functioning skills to individuals with autism. For example, Alacantara (1994) used adult modeling (through task analysis) to teach grocery shopping skills to three students with autism and results showed they all acquired the target skills and also generalized the skills across settings. Another study by Shipley-Benamou et al. (2002) used video modeling to teach several functional living tasks to three children with autism and found that video modeling significantly facilitate the acquisition and independent performance of the target living skills.

Furthermore, video modeling can be also used to improve other behavior or skills in individuals with autism. One such example is to use video modeling to teach perspective taking successfully to children with autism (Charlop-Christy & Daneshvar, 2003). Recent studies also suggested video modeling can be an effective strategy when implemented as part of an intervention package because it can maximize the intervention efficacy and generalization. For example, Apple, Billingsley, and Schwartz (2005) conducted a study of two experiments to examine the effects of video modeling alone and with self-management on compliment-giving behaviors of children with HFA. Results indicated application of both video modeling and self-management strategies produce and maintain social initiations when video modeling alone fails. Other researchers (i.e., LeBlanc et al., 2003) used another intervention package including video modeling and reinforcement to teach perspective taking skills to 3 children with autism and demonstrated positive outcomes. In addition, 2 out of 3 students can generalize their learned skills to an untrained task.

#### *Social Stories*

According to Baron-Cohen et al. (1985), theory of mind deficits is evident in children with HFA. They have difficulty understanding others' thoughts, mental states, desires and intentions. These deficits are believed to be responsible for the poor social communication skills in children with HFA (Baron-Cohen, 2000). Traditional educational approaches fail to insure a meaningful improvement in their social performance. Research indicated the use of social stories is a more effective intervention (Sansosti, Powell-Smith, & Kincaid, 2004). A social story is a short story that is written from the student's perspective and can be used to help the target student better understand complex and confusing social situations (Gray & Garand, 1993; Gray, 1997). According to Attwood (2000), social stories

*provide information on what people in a given situation are doing, thinking or feeling, the sequence of events, the identification of significant social cues and their meaning, and the scripts of what to do or say; in other words, the what, when, who and why aspects of social situations* (p. 90).

Previous research has demonstrated the effectiveness of social stories in teaching children with autism (e.g., Hagiwara & Myles, 1999; Noris & Dattilo, 1999). Social stories can be used to educate individuals with autism across various behavior and settings. Firstly, social stories have been proven effective in decreasing undesirable behaviors. For example, Kuttler et al. (1998) used this method and successfully decreased tantrum behavior in an adolescent in residential settings. Lorimer et al. (2002)'s study showed that social stories implemented by family members are effective in decreasing the precursors to tantrum behavior in a young child in home settings. Similarly, a study by Brownell (2002) used musical social stories to improve social behaviors in 4 primary students successfully in an inclusive classroom. Recently, Scattone et al. (2002) used a multiple baseline across participants design to assess the effectiveness of social stories in decreasing disruptive behaviors of 3 children with autism and results revealed positive effects for all participants.

Social stories can also increase appropriate or more socially acceptable behaviors in individuals with autism (Crozier & Sileo, 2005). Feinberg (2001)'s study demonstrated the effectiveness of social stories in increasing more socially acceptable behaviors such as initiating social activity and increasing flexibility among autistic children during social activities. A study by Romano (2002) also indicated social stories are effective in teaching appropriate greeting behavior to individuals with autism. In addition, previous research

indicated the most effective and positive intervention outcomes are obtainable only when social stories are used as one of the components of an intervention package, rather than being used alone. Thiemann and Goldstein (2001) used a multiple baseline design to measure the effects of an intervention package that combined social stories and video feedback on the social communication skills in five children with autism. Results showed that all participants gained increase in their social communication skills, which are consistent with previous findings.

Generally social stories are written in six basic types of sentences: descriptive, directive, perspective, affirmative, control and cooperative (Gray, 1998, 2000). Gray (1998, 2000) pointed out that these 6 types of sentences should be used at a balanced ratio: usually match 2 to 5 descriptive, perspective (or cooperative), and/or affirmative sentences with 1 directive (or control) sentence in a social story (Gray, 1998, 2000). In addition, Swaggart et al. (1995) proposed the following 10 steps necessary for creating a social story:

1. Identify a target behavior or problem situation for social-story intervention.
2. Define target behavior for data collection.
3. Collect baseline data on the target social behavior.
4. Write a short social story using descriptive, directive, perspective and control sentences.
5. Place one to three sentences on each page.
6. Use photographs, hand-drawn pictures, or pictorial icons.
7. Read the social story to the student and model the desired behavior.
8. Collect intervention data.
9. Review the findings and related social-story procedures.
10. Program for maintenance and generalization (p. 14-15).

Besides the above steps, educators or professionals should also take the following related issues into consideration when developing social stories for children with autism: (1) make sure the social stories being written are within the target student's comprehension ability (Crozier & Sileo, 2005; Gray, 1998); (2) incorporate the student's preferences and interests into the writing of social stories (Gray, 1998); use pictures to help the target student understand the social story when appropriate and necessary (Crozier & Sileo, 2005); (3) introduce a social story to the target student in a relaxed, distraction-free environment (Gray, 1998); (4) make ongoing revision to social stories in accordance with the target student's progress (Gray, 1998). Most social stories are developed or written by professionals or parents. Research proposed the following two key ways to implement social stories: (1) read by the target child independently, or by his/her caregiver; (2) presented through another medium, such as audio equipment, computer-based program, or via videotape (Charlop & Milstein, 1989; Sansosti et al., 2004).

### **Conclusion**

It is evident that the interventions introduced in the previous section have been proven effective in teaching children with HFA in the United States for years. We believe children with autism in other places of the world can also find them beneficial. However, it is noted every child is unique and has his/her own strengths and needs. One child may find one of the above interventions especially beneficial while another child may experience no positive behavioral change at all by using the same intervention. So it is impossible that one intervention can fit all children, nor can all children gain the same degree benefit from these interventions, either. Thus, meaningful intervention outcomes are obtainable only when interventions are built on the student's strengths and interests. The ultimate goal of different interventions is the same: to enhance quality of life for children with autism. Like all typically developing children, children with autism also desire and deserve better education and higher quality of life. All interventions introduced previously have their limitations, and more explorations need to be done in the future to better serve children with HFA.

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