Promoting Social Communication in High Functioning Individuals with Autistic Spectrum Disorders

Rhea Paul, Ph.D.

Professor of Communication Disorders, Southern Connecticut State University and Lecturer, Yale Child Study Center

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Corresponding author of proof and reprints:

Rhea Paul, Ph.D.

Yale Child Study Center

P.O. Box 207900

230 S. Frontage Rd.

New Haven, CT 06520-7900

Phone: 203/785-3388

E-Mail: rhea.paul@yale.edu

Synopsis: Promoting Social Communication in High Functioning Individuals with Autistic Spectrum Disorders

This paper reviews a range of social communication interventions that have been developed for students with autism at the preschool, school-age, and adolescent level. Both adult-mediated and peer-mediated methods that use highly structured, child-centered, and hybrid methods are examined. Programs that provide information on generalization and maintenance are identified. A set of recommendations for programs that would appear to be most appropriate for students with Asperger Syndrome is presented.

Promoting Social Communication in High Functioning Individuals with Autistic Spectrum Disorders

Social and communicative dysfunctions are arguably the most handicapping conditions associated with Asperger syndrome. Although the rubric *social communication* is frequently used to encompass these deficits, *social communication* is actually a redundant term. All communication, by its definition as an exchange of information between speaker and listener(s), is social in nature. However, the purpose of using the term *social communication* here is to focus attention on the close relationship between the linguistic forms of communication utilized by high functioning individuals with autistic spectrum disorders (ASDs), and the function of these skills in the achievement of social interaction. In fact, in typical individuals over the age of three, linguistic communication is the primary modality of social interchange.

While linguistic communication skills are used for a variety of purposes -- including regulating others' behavior, referring to objects and events, narrating and predicting experiences, and learning academic content – the present paper will focus on just one of these functions: achieving mutuality and engagement with others. Effectively establishing this engagement, even with access to advanced language skills, constitutes one of the core deficits of intelligent individuals with AS. Social communicative abilities are crucial to achieving the community integration and peer acceptance that would seem to be within the

grasp of these bright young people, yet so often eludes them. The high rates of depression reported in verbal adolescents with ASDs are generally interpreted to be a reaction to this frustrating situation.[1] Young people with AS are frequently eloquent in their despondency at their isolation from the social world.[2]

This review of programs for addressing social communication needs in AS, then, will highlight what is known about recruiting the language competencies possessed by high functioning individuals in the service of promoting cooperative play, social inclusion, and friendship. It will examine programs that target interactive skills at a range of developmental levels from preschool through adolescence, and with a range of theoretical perspectives from highly teacher-directed discrete trial methods to more naturalistic and child-centered approaches. An effort will be made to highlight programs that have reported carefully applied research designs, well-defined groups of children, and appropriate measures of change and generalization in peer-reviewed venues, which, unfortunately, constitute a minority of the programs advocated for this population. Although the focus of this volume is on Asperger syndrome, the needs of children with this disorder do not differ greatly from those of high functioning children with other kinds of ASDs. Since most research on social communication training has focused on children with autism or PDD-NOS, and few published studies have looked at AS exclusively, studies that include high functioning, verbal children at all points along the autistic spectrum will be included. At the conclusion of the review, this information will be interpreted in

light of the specific characteristics of AS, and recommendations for selecting programs most appropriate for the AS population will be made.

Early Social Communicative Interventions

During the preschool period, between 3 and 5 years of age, typical children develop a range of social interaction skills that are mediated in important ways by their language development. Garvey[3] showed that children as young as three use language to negotiate play roles and activities ("I'll be the doctor and you can be the sick person"). According to Patterson & Westby,[4] children by age three use language for a multitude of purposes in play, including to narrate action, to plan future events in the play context, to mark dialogue with metalinguistic markers such as 'he said,' and to vary voices to distinguish characters. Children with AS, even though they do not show significant delays in the acquisition of the forms of language, are, as a result of their core deficits, less able to demonstrate these varied uses of language in the context of cooperative play, and often show great difficulty in entering sociodramatic play situations without support.[5] For these reasons, social communication programs in the preschool period typically use play as the primary context.

Wolfberg[6] reports that, without support, verbal children with ASDs tend toward repetitive enactments of solitary routines around their obsessive interests and avoid social play or approach peers with obscure, one-sided overtures that are unlikely to be reciprocated. Schuler and Wolfberg[5] discuss the challenges in helping children with ASDs participate more successfully in social play. One of

the paradoxes of this endeavor is that play -- by its nature -- is symbolic, exclusively child-centered, open-ended, and defined by joint attention and action. Yet these very attributes tap the most profound areas of deficit in children with ASDs. Moreover, it is known that effective interventions for children with ASD are highly structured, routine, predictable, and adult-organized.[7] How, then, can adult-structured interventions help youngsters to participate in the child-directed, dynamic flow of interactive play?

Schuler and Wolfberg[5] argue that the way to resolve this conflict is to provide children with ASDs with opportunities for *guided participation* in social play. There are two primary means of supplying this guidance: through coaching by adults and through mediation provided by trained peers. Brown & Conroy,[8] Lord and McGee[9] and Rogers[10] provide reviews of published literature on preschool social communication intervention. These reviews reveal that children with ASDs do show increases in social play when appropriate supports are provided. For the present review, some examples of adult-mediated approaches will be presented, then those that make use of trained peers will be discussed.

Adult-mediated Interventions. Early studies in this area focused on adult-mediated interactions, using applied behavior analysis procedures. Allen and colleagues[11] showed that restructuring teacher's reinforcements to socially isolated children, by ignoring their initiations to adults and reinforcing attention to peers, was enough to increase child-to-child interactions. Odom, et al.[12] used teacher prompting without reinforcement to increase social interactions of young

children with ASD. Individual coaching using teacher prompts and praise in the context of peer play was also found to increase rates of social initiation by target children, but these bids were only responded to 50% of the time by typical peers.[13] Only when peer training was added did rates of successful interaction increase. Drasgow, et al.[14] suggested that these procedures need to be practiced in all the environments in which generalization is to occur in order for the interactive behaviors to be maintained.

Goldstein, et al.[15] used adults to teach sociodramatic scripts to two trios of preschool children (one target child with ASD and two peers with typical development) within an inclusionary preschool classroom environment. All children were taught each of three social roles (e.g., doctor, nurse, patient) using teacher instruction, which was systematically reduced over time. Results revealed that interaction and generalization improved during free play periods at preschool, but effects depended on the continuation of teacher prompts and did not lead to increases in other social exchanges during the rest of the class day.

Less operant approaches to promoting social interaction have also been used. Wolfberg and Schuler[16] provided an overview of an integrated play group model, which uses a social constructivist framework; i.e., one that relies on the notion of play as an artifact of the "culture of childhood." This framework requires ethnographic observations of play to avoid developing interventions that interfere with its organic structure. Thus strategies include monitoring play initiations to discover their form in the particular "cultural group" of the target

child's classroom; scaffolding interactions by acting as in interpreter for the target child and providing appropriate cues to interaction; guiding social communication by fostering invitations to play; enlisting reluctant peers; helping target children respond to peers' cues; maintaining and expanding interactions with narrative language; and guiding play by incorporating the target child's unusual behaviors (e.g., lining up objects) into a meaningful play context (e.g., acting as clerk who neatens up shelves in a play store). Wolfberg and Schuler[16] present preliminary results of a case study that argue for the effectiveness of this approach.

Another naturalistic approach to social communicative intervention is referred to under the rubric of "friendship" activities.[8] These approaches typically rely on teachers' prompting children to compliment and show affection for each other within the naturally occurring routines of the preschool day (unlike the more operant approaches, which employ more structured training in out-of-class environments). McEnvoy, et al.[17] have applied these techniques to preschool children with ASDs, with some positive results.

Other approaches make use of "hybrid" methods; those that combine elements of operant techniques with more naturalistic methods. One hybrid approach that has been used to increase socialization in preschoolers with ASDs is incidental teaching. This method involves arranging the environment so that objects and activities known to interest the child are in sight but out of reach, following the child's attentional lead to choose the focus of interactions, and

using expectant waiting rather than prompts to elicit communication from the child, so that the child is the initiator. Incidental teaching approaches have been shown both to promote language use and to enhance social initiations and responses in children with autism,[18] and results have been maintained over time.[19]

Krantz & McClannahan[20] used script-fading procedures with preschoolers with minimal reading skills. The children were taught to use the written cues "Look," and "Watch me" to initiate conversation with adults who did not prompt but only responded to conversation directed to them. The scripts were faded by cutting away portions of the cue cards. Unscripted interactions were found to continue and generalize to new topics.

Quill[21] has presented a comprehensive curriculum for developing social and communicative skills in young children with autism at various levels of functioning. The curriculum advocates both highly structured and naturalistic approaches and suggests focusing on the target child's responsiveness to typical peers, rather than promoting initiations (p. 89). Intervention guidelines include organization of the environment to facilitate participation and cooperation, careful selection of materials, and activities structured to foster the target child's participation. Activities early in this sequence include:

- Closed-ended activities, such as putting features on a Mr. Potato Head
- A limited set of materials

- Separate materials for each player
- Activities that require no sharing, turn-taking or waiting; e.g., parallel play

The target child is given coaching and practice in observing, responding to, and imitating the typical play partner in order to progress to activities that are more open-ended, use a wider variety of materials, and involve more interactive play. Coaching of typical peers to use strategies such as nonverbal cues to gain the target child's attention, to wait for a response, and to interpret unusual responses is also a part of this curriculum. Numerous examples of ways to embed these principles in typical preschool classroom activities are provided. As a synthetic, comprehensive curriculum, this program draws on methods devised in many of the earlier studies reported, but it does not provide any independent empirical validation of its efficacy.

Similarly, empirical studies that contrast hybrid approaches with naturalistic friendship techniques or more structured approaches like Goldstein et al.,[15] have not been reported. Moreover, it is important to be aware that most of the studies reported above involved single subject or very small group designs and used general outcome measures, such as social initiations, without looking more specifically at the use of particular communication strategies (e.g., pointing, signing, talking). Thus we have much to learn before we can identify the most efficient teacher-directed approaches for promoting verbal means of social interaction in young children with AS.

Peer-mediated Interventions. The drawbacks of adult-mediated play interventions appear to be that target children become dependent on adult input in order to continue interacting. Although some systematic fading procedures have attempted to address this problem,[12] very highly trained adults are needed to implement them appropriately, and teachers often express reluctance to engage in them.[22] Brown and Conroy[8] point out that teacher interventions may even serve to interrupt direct child-to-child interactions.

For these reasons, recent approaches to enhancing social interactions in this population have turned to peers as primary agents of intervention. Initially, it was hoped that merely placing children with disabilities in classrooms with typical peers would enhance social communication. Although modest improvements were observed in some studies,[23] others failed to find any effects at all.[24,25] Further, these studies employed children with a range of developmental disabilities, and did not focus on the specific difficulties in socialization presented by children with ASDs.

The work of Strain and colleagues represents the most sustained effort to develop successful peer-mediated socialization strategies, and provides the strongest empirical support.[26, 27, 28] In their approach, typical peers are taught to present and persevere in presenting "play organizers" to classmates with ASDs. Organizers consist of sharing, helping, giving affection, and praising. Peers are taught these skills in role-playing activities with adults and then are cued and reinforced by the adults in play sessions with target children. Reinforcements are

carefully faded. Work by this group,[27, 29] as well as in replication studies,[30, 31] has demonstrated both generalization and maintenance. Strain et al.[32] have also shown that self-monitoring techniques can be used so that interactions are successfully maintained without adult reinforcement. The importance of delivering interventions within inclusive preschools rather than in laboratory settings for achieving generalization and maintenance has also been emphasized.

In a case study involving a high functioning child with ASD, and Oke and Shriebman,[33] extended this method by adding two components: they trained a typical peer to differentiate between parallel and interactive play, and trained the target child to initiate interaction with the peer. They found that these additions led to maintaining high rates of interaction, decreased inappropriate behaviors, and generalization across peers (but not across settings).

Despite the evidence supporting their success, these programs are difficult and labor-intensive to implement, requiring highly trained peers and precise adult control of the peer training. Although training manuals,[34] and extensive discussions of the method in the research literature are available, teachers outside of comprehensive, university- or hospital-based settings object to implementing them.[35] Moreover, Strain and Hoyson[36] have argued that a comprehensive inclusionary program implemented over a sustained period of time during the preschool period is necessary to achieve the levels of success reported in the literature, so that even if carefully implemented peer social

communicative programs are instituted, they may not achieve maximum effectiveness without the other features offered by comprehensive programs.

As a consequence of these difficulties and limitations, some approaches have attempted to devise simpler forms of peer-mediated intervention. Goldstein and colleagues[37] have extended their script-based methods to include peer-mediation, for example. Their Buddy Skills Training Program teaches three simple strategies to peer "buddies:"

- STAY with your buddy: maintain physical proximity to assigned partner
- PLAY with your buddy: maintain proximity while continuing to play with your partner (in programs specifically adapted for children with ASDs, partners are offered a choice of one activity each from a visual "choice board" then instructed to play with each partner's choice for half the "buddy period" session, usually 10-20 min.)
- TALK with your buddy: say your partner's name to establish joint attention, make suggestions for playing together, talk about the play, respond to what your partner says by repeating, saying more about it, or asking a question.

Research on this program demonstrated improvements in the frequency of social communication between buddies that persisted outside the specific "buddy time" sessions.[38] English et al.[38] noted that training the target children in buddy skills did not increase social interactions any further; suggesting that

training typical peers is adequate to achieve the observed increases in reciprocity. This program was not developed specifically for children with ASDs, but recent extensions with specific modifications for children with ASDs, such as visual choice boards, have shown promise.

Another attempt at a simplified program is presented by Garfinkle and Schwartz.[39] Three children with ASD were taught to imitate peers during small group activities in an inclusionary preschool classroom. Results suggest that participants increased peer imitation behavior in the training setting, and generalized them to free play settings, as well. Increases in other social behaviors, such as proximity to peers and number of peer interactions were also reported to increase.

Summary. There have been few studies that compare different procedures for enhancing social interaction at this developmental level. One study compared structured play, adult instruction, peer instruction, and a combination of approaches found that peer-mediated methods resulted in largest effects, and the greatest generalization and maintenance.[27] However, children with autism were not part of the subject group. Careful comparison studies among social communication training methods for children with ASDs are clearly needed.

Social Communicative Interventions for School-Aged Children

During the school-age period, typically developing children expand the purposes for which they use language. Much talk during the preschool period concerns the here-and-now, immediate, tangible environment. Language reflects

what the child already knows about the world around. During school age, however, children begin using language to acquire new information; about objects and events with which they have no direct sensory experience.[40] For, example, people talk to preschool children about where their shoes are. They talk to school aged children about where the Andes are. Talk between peers changes during the elementary school years, as well. One prominent change is a move away from sociodramatic play as the primary context for social interaction to more topic-centered forms of interaction, such as discussing shared interests and playing games with rules. These changes result in necessary shifts in the contexts in which social skills training takes place.

School age is the time when higher functioning individuals with ASDs begin to be aware of loneliness and isolation. Bauminger and Kasari[41] reported that 22 children with autism (ages 7-14) reported significantly higher levels of loneliness and poorer quality of friendship than a matched group of typical peers in an interview study. Thus, children with AS are likely to begin to experience social isolation in the elementary school years, and social communicative training should be an important part of their intervention programs. Like programs for younger children with ASDs, programs for school-aged children fall at various points along the continuum of naturalness and make use of both adult- and peer-mediated strategies.

Adult-mediated Interventions. Coe, et al.[42] used direct instruction and primary reinforcers to teach four steps (pick up, throw, initiate, praise) in a chain

of actions involved in playing ball to two children with autism. The children were found to increase their interactive behaviors in ball play, although generalization and maintenance were not reported.

Hwang and Hughes[43] reviewed 16 studies aimed at increasing social communication skills in children with ASDs. They examined five studies that used time delay (presenting a stimulus and waiting for specified periods before giving the child a prompt to respond) as the primary form of intervention for verbal children with ASDs. These studies resulted in increases in verbal responses during free play, but had little effect on eye contact. When time delay was combined with other strategies, such as teaching social amenities (please and thank you) and naturally occurring reinforcement, results were similar. However, results of probes for generalization and maintenance were mixed, reinforcing the fact that consistent carry-over is difficult to achieve with highly structured, adult-directed methods.

More child-centered methods for children at this level have also been presented. Harris, et al.,[44] and Tiegerman & Primavera,[45] used contingent imitation, having the adult imitate the child's actions. Tiegerman & Primavera[45] reported that imitating the child's play behaviors led to increases in the frequency and duration of gaze toward the adult. Harris, et al.,[44] had adults imitate the child's self-stimulatory behaviors to increase positive affect and attention to others. Findings indicated positive changes, but generalization and maintenance were not examined. Gutstein & Sheely[46] produced a collection of

exercises based on Greenspan & Wieder's[47] Relationship Development Intervention. However, empirical data about effectiveness, generalization, and maintenance are not available.

Another child-centered method that has attracted a good deal of interest in recent years is the use of social stories.[48] The stories are written collaboratively between the child and the facilitator. They are usually focused on reducing maladaptive behaviors, rather than on social interaction, using a specified format. They state a problem (Waiting in line is hard), give a reason for the socially accepted action (The teacher needs to make sure everyone gets outside safely without pushing), give the child an acceptable action to perform (I can wait in line. I can think about how much fun it will be to play outside while I am waiting), and an evaluation (My teacher will be happy when I wait quietly in line. I will feel good when I get outside). An initial study used a multiple baseline approach to monitor changes in three social behaviors targeted in social stories for one girl with autism, and found changes in only one of the three.[49] More recent studies, however, have added some features to the intervention that appear to facilitate its efficacy. Hagiwara & Myles[50] used a computer-based format for social stories with three school-aged boys with ASD. Using a multiple baseline design, the study showed the intervention increased skill levels of some of the participants in certain settings, with some generalization to new settings. Cullain[51] used social stories to reduce anxiety and inappropriate behaviors in five elementary school children with autism who were placed in inclusive classrooms.

Using a treatment-withdrawal-treatment design, the study suggested a decrease in frequency of inappropriate behaviors and anxiety levels. Social stories, then, appear to be somewhat effective in reducing problem behaviors, but limited evidence of generalization or maintenance is available.

In another child-centered approach, Baker, Koegel, and Koegel[52] created group games for three high functioning children with ASD based on each child's special interest, then taught the game to the target child and peers for use during a free period at school. Results suggested strong increases in peer interaction that were maintained through the follow-up period and generalized to other activities. Increases in positive affect in target children were also seen.

Hybrid methods of adult-mediated social communication programs provide high levels of structure and models while allowing the child to initiate social interactions. Two hybrid approaches reviewed by Hwang and Hughes[43] are *naturally occurring reinforcement* and *environmental arrangement*. These two approaches were combined in studies by McGee, et al.[53] and Pierce and Shriebman.[54] Both trained peers through modeling, role playing and direct instruction to use natural reinforcement and to arrange environmental events to elicit communication from verbal children with autism. Both studies reported prolonged social interactions with peers. Pierce & Shreibman[54] also reported some generalization across persons and settings.

Another hybrid method that has been used in peer-mediated social skills programs is Pivotal Response Training (PRT). This approach involves choosing

behaviors as targets that will have widespread, positive effects on a range of behaviors. In this way, PRT is thought to produce generalized improvements on areas that do not receive direct intervention. Pivotal areas that have been identified include responding to multiple cues, increasing motivation, self-initiation, and self-management.[55] Most germane to social communication are programs that have aimed at self-initiation. Koegel, et al.[56] used asking questions as a pivotal behavior, and taught children with autism to spontaneously initiate questions by putting objects in an opaque bag and, using prompt-fading procedures, training them to ask "What's that?" in order to be able to play with the object. Results indicated that, after completion of training, subjects used the question to obtain labels for objects whose names they did not know, that responses were generalized to the home setting, and that expressive vocabulary size increased as a result of their requests for names of new objects. In another study using this method, Thorp, et al.[57] reported increases in appropriate language, social engagement and decreases in inappropriate behavior using this method, but less effect on social initiations. Generalization and maintenance were not assessed.

Jahr, et al.[58] investigated the way in which language can be used to support social skills learning. Six high functioning school aged students with autism were taught cooperative play skills using two methods. The first involved observing two models enact a play scene, then having the target student take one of the roles in repeating the scene. The second method was the same,

except that the student with autism was required to give a verbal description of the scene before re-enacting it. Results showed that students failed to acquire cooperative play until the verbal description was included in the training. With verbal descriptions, the subjects were able to take longer turns within episodes than during pre-training, and skills generalized across play partners, setting, and time. This study demonstrates that for verbal students with autism, language can serve as an important support to skill acquisition.

Krantz & McClannahan[59] used printed cues within classroom routines to stimulate social initiations in four verbal students with autism. Peer initiations increased significantly, and all four subjects used novel language to initiate interaction. Effects were maintained when cues were faded, and generalized to new peers.

Another approach that has shown promise is the use of video modeling. Charlop and Milstein[60] successfully used this method to teach conversational skills to three high functioning boys with autism. The boys were shown a videotape containing simple, appropriate conversations, then practiced the same conversations with an adult. In a later study, Charlop, et al.[61] showed that video modeling resulted in faster acquisition of skills such as spontaneous labeling of objects and greetings than did modeling from live demonstrations, and was effective in promoting generalization. Corbett and Larson[62] have also used video modeling to teach social communicative skills.

Peer-mediated Interventions. One of the earliest investigations involving peer-training for school aged children was done by Strain, et al..[63] Typical peers were taught to elicit, prompt and reinforce social behavior in two pairs of children with autism. Social behaviors were found to increase during treatment, but fell when interventions were withdrawn. Later studies have shown the importance of using natural contexts in achieving generalization. Shafer, et al.[64] used direct models and prompt training to teach peers to elicit interactive play with four children with autism. Increases in responses and initiations in children with autism were seen, were maintained over time, and generalized to new peers when these joined the play groups. Lord[65] reviewed research by her group showing that daily exposure in peer play with trained peers increased several social behaviors in children with autism, including proximity, appropriateness, and time spent looking at peers, although it did not increase initiations. These results generalized to new trained peers, as well. Findings were replicated with high functioning children with autism.

Pierce & Shreibman[66] trained eight peers to deliver PRT to two children with autism. Multiple baseline results showed that each target student made gains in maintaining social interactions and generalized across people, settings and materials. Follow-up data demonstrated maintenance of skills over a two month period. Gains in initiations were not documented, however.2

The difficulties of implementing these kinds of peer-mediated approaches are similar to those seen at the preschool level. They are labor-intensive and

require constant monitoring and readjustment. Again, researchers have attempted to use simpler methods for achieving increased peer interaction. One method is the Social Skills Group. Kamps, et al.[67] conducted daily play sessions in groups of one target and three typical students. Scripted social skills instruction; including greeting, sharing and taking turns, and helping; was provided to the group for 10 minutes, followed by 10 minutes of play in a planned activity. Increases in social skills, length of interactions and consistency of responding were found for target students. Follow-up evaluation at the end of the school year showed that some skills were maintained over time.

Roeyers[68] presented another simplified approach. Five to13 year olds with ASD were paired with peers who were simply told to stay "on the same level" as their partner. Although improvements in rate of interaction were seen, children with autism still had difficulty managing social situations. Gunter, et al.[69] taught elementary school students to "prompt and praise" two students with autism while engaging in free play dyads. Prompts involved simple statements such as 'Say hello to ____.' Peers were also taught to offer verbal praise to the target student when a prompt elicited the desired reply. A "multiple exemplar approach," in which several peers took turns with each student, proved effective in increasing initiations by students with autism. Some generalization to untrained peers and environments was seen.

Peer networks are another strategy that has been used to increase social acceptance and involvement of children with disabilities. Peer networks involve

awareness training about disabilities for typical peers, supervised joint activities in which typical peers are taught to initiate and model appropriate social interactions. Kamps, et al.[70] applied this method to three students with autism. Two to five peers served as a support network for each target student during several 10-20 minute sessions during the school day, including reading, lunch, and game time. They were taught to structure activities using scripts, prompting, and reinforcement for interaction. Results showed increased interaction time for all target students and generalization to new settings for two of the three. Other versions of the peer network approach include Special Friends and Circle of Friends.[71,72] These programs provide information about disabilities to students and teachers, specific information about the target student (likes and dislikes, communication abilities, etc.) and ideas for support peers can provide. Little data is available to support the efficacy of these programs, and there have been few instances in which they have been applied to students with autism. Whitaker, et al.[73] provide an initial report of the use of a Circle of Friends approach with six children with ASD.

Summary. Social communicative training at the elementary school level strengthen the suggestions seen in research on preschoolers; i.e.,

- In adult-mediated approaches, direct instruction is the most effective method for initial skill acquisition

- While direct, teacher-directed instruction is effective in improving interaction skills, less direct, more child-centered and hybrid methods can also be successful
- Peers are powerful mediators and greatly enhance the ability of students with ASD to participate in social interactions in natural environments. However, peers who mediate these interactions require direct instruction, repeated models and practice.
- Using multiple peers who meet the above standards appears to be particularly powerful.
- Although students with autism can be taught to respond to social interactions, training them to initiate socially appears to be more difficult.

Social Communicative Interventions in Adolescence

In adolescence, typical young people begin to engage in social interaction primarily by "just talking." Unlike younger children, whose social interactions are mediated by activities such as games, teenagers use language as the primary channel for interaction, as their long hours on the telephone, and now on Instant Messaging, attest. Although students with AS may have the requisite language skills to engage in these kinds of interactions, they, like their younger counterparts, have severe difficulty in using the skills they have to engage in social interactions.[74] As we saw with younger children with ASD, intelligent individuals with these disorders frequently experience a haunting sense of

aloneness that they feel powerless to overcome. Despite their command of language, they seem unable to marshall it to enter successfully into the social fray of adolescence. These limitations not only affect their ability to form friendships but limit their vocational opportunities, often confining these very intelligent young people to menial jobs that make no use of their considerable talents, because of their inability to function in interviews or to get along with co-workers.[75] Intervention to address this social isolation remains crucial at this stage of development. In fact, for students with AS, social communicative training may be the most important feature of intervention at the secondary school level.

Adult-mediated interventions. Kyparissos[76] developed a strategy for teaching adolescents with ASD to engage in extended conversations with each other. Students were taught to extend conversations by asking a question about what the previous speaker had said. Training began with scripts that provided participants opportunities to ask questions. Scripts were gradually faded. Training scripts included *what, where* and *when* questions; generalization was assessed on *who, why*, and *how*. Generalization was seen to untrained conversations, and participants were rated as improved in conversational skills by blind raters after the intervention was completed.

Self-management strategies are thought to be especially important for maintaining social behaviors, since real social situations provide infrequent, relatively weak reinforcements. Koegel and Frea[77] reported improving

conversational skills in two high functioning teenagers with autism by using reinforcement to teach social skills such as maintaining eye contact and appropriate topics. The students rapidly learned these behaviors; then they used wrist counters to tally their own frequency of appropriate behaviors, which were converted to points and exchanged for reinforcement. The reinforcement schedule was gradually thinned. Conversational behaviors were maintained for 30 minute intervals between token reinforcers, with generalization of skills to new situations. Improvement was seen in related, but not in entirely new conversational skills.

Peer-mediated strategies. Morrison, et al.[78] combined peer mediation and self-monitoring in a study of four young teenagers with autism. The students were taught, along with a group of typical peers, to use and monitor social skills; including requesting, commenting, and sharing; during game play. Peer monitoring and self-monitoring were alternated. The authors reported that both techniques increased initiations and social interaction time, with little difference between the two strategies. Generalization and maintenance were not reported.

Social skills groups have also been used at the adolescent level, as they have for elementary students. Ozonoff & Miller[79] used social skills groups to teach adolescents with autism about understanding others' mental states (Theory of Mind; ToM). Five teenagers with autism met weekly for 14 weeks. A structured curriculum on ToM was presented. Students improved in

understanding others' mental states; however, generalized gains to other social skills failed to appear.

Haring and Breen[80] used Circle of Friends to create a social network for a junior high school student with autism. Typical peers volunteered to meet weekly for 30 minutes to plan social interactions with the target student. Peers were taught to initiate, prompt, and praise the student between class sessions. The intervention resulted in an increased frequency of social interactions with peers, and were maintained over two months.

Summary. Social communicative interventions for adolescents are an essential, perhaps the most important aspect of an intervention program. The small amount of research done on this age group suggests that, again, direct instruction in the skills to be learned is necessary. Teaching one social skills, such as ToM, does not necessarily lead to improvement in general social interaction. All the programs developed for students at this level involve some form of peer-mediation. This stems from the great need to help students at this age develop direct peer interaction skills, and derives from the fact that seems clear from the bulk of this review, that peer-mediated interactions are an extremely powerful intervention for improving social communication.

Implications for Enhancing Social Communication for Children and Adolescents with Asperger Sydrome

An attempt was made in this paper to review studies that have investigated a variety of social communication skills curricula that included

children with ASD. None of these studies, however, focused specifically on children with AS. What can be gleaned from this review that can inform the practice of clinicians faced with helping these youngsters to engage in social interaction?

First, social communication skills are arguably the skills most in need of attention and intervention in children with AS, from the earliest point at which diagnosis is established, and throughout the life span. This implies that social communicative skills should be a primary area within the Individualized Educational Plan of all students identified with AS.

Second, the data reviewed suggests that for children with ASDs, social communicative skills requires direct, focused instruction on the actual target behaviors. Teaching ToM for example, will improve ToM performance, but will not necessarily improve social interaction. Each skill the child needs to learn should be the focus of intensive instruction.

Third, the context for social communicative training needs to be developmentally appropriate. At the preschool level, pretend, dramatic, and toy play are the best contexts in which to foster social interaction. Supportive visual information in the form of simple word cards, picture schedules, etc. can be helpful, as can verbal rehearsal before entering play interactions. At the elementary grade level, games with rules, "lunch buddies," and social skills groups focused around crafts or themes of interest are good venues. Visual support in the form of written schedules and calendars and verbal rehearsal

continue to be useful. For teenagers, discussion groups of peers with AS can be helpful for giving youngsters the opportunity to share feelings about their disability, much as other adolescents form social bonds through "just talking." Social networks comprised of AS and trained typical peers can help the target student negotiate the difficult transition times during the school day.

Fourth, in addition to intensive, focused instruction in the initial learning phase, children with ASDs require abundant opportunities to practice newly learned skills in varied, naturalistic contexts in order to achieve generalization and maintenance. Since most children with AS will be placed in mainstream or inclusive educational settings, these opportunities should be fairly easy to engineer, and natural opportunities for interaction will arise out of their day-to-day experiences. However, letting the child "sink or swim" in the natural environment is not sufficient. To increase the chances for enduring improvements, the aid of peers must be enlisted.

Fifth, peers can aid target children best when they receive training in techniques to facilitate inclusion and interaction with friends with ASDs. Peer training can take a variety of forms. In programs with highly trained and motivated staff, intensive peer training programs have demonstrated efficacy. However, even in programs with less ideal conditions, simpler forms of peer training are available and can be powerful in enhancing social interactions. These simpler programs appear to work best when several peers are trained and "trade

off" so that each target child has repeated opportunities to interact with multiple trained peers.

Klin and Volkmar[75] have presented intervention guidelines for students with AS in which they emphasize the need to teach social communication skills. They highlight the following elements for inclusion in social skills training programs designed for this population:

- Use of visual supports, including both written and pictorial representations of expected activities and behaviors
- Social perception training. In addition to training students with AS to engage in social interactions, as the studies reviewed here have done, Klin and Volkmar suggest the need to help these students learn to "read" social cues given by others, as a way to facilitate appropriate interactions. ToM training could be one part of this aspect of social skills intervention.
- Training in conventional pragmatic and conversational rules. Again, studies to date have not addressed this issue, but direct instruction in increasing awareness of pragmatic and conversational conventions, and practicing appropriate conversations using scripts, visual supports, and role playing various scenarios would appear to be logical avenues of intervention.
- Improving prosody. Students with AS often show abnormal prosodic behavior.[81] Again, this aspect of social communication has

not yet been a focus of research, but prosodic behavior is known to affect social and vocational acceptance.[82] Increasing awareness of appropriate prosodic patterns, modeling and practice of prosodic changes can be an important aspect of intervention.

- Self-monitoring. It is essential to help students with AS keep track of their own behavior and make on-line judgments about its appropriateness. Self-monitoring, too, requires direct instruction, and ongoing practice.

For students with AS, several of the programs reviewed here would appear to be particularly germane. Schuler and Wolfberg's[5] *guided participation* model, using coaching by adults and mediation by trained peers provides an appropriate form of intervention for preschoolers with AS, who have the verbal skills to readily take advantage of these interventions. Incidental teaching methods, aimed at increasing the quantity of verbal initiations, would also appear to be useful at this stage of development. Krantz and McClannahan's[20] script-fading procedures are also promising, in that they capitalize on the frequently advanced reading skills in this population, and put print to a meaningful purpose. Research on using simpler peer mediating techniques with children with autism is emerging that suggests techniques such as "Stay, Play, Talk" will be powerful.[83]

For school-aged children and adolescents with AS, the data suggest hybrid techniques may be most effective, especially when aimed at pivotal verbal behaviors such as asking questions. Support of printed materials, such as visual

schedules and calendars, as well as verbal rehearsal, are especially appropriate for highly verbal children with AS. Video modeling looks especially promising, and a combination of this approach with verbal rehearsal may be particularly useful in the AS population. Peer-mediated approaches continue to be important. Relatively simple programs that can be adapted for public schools and other community venues, such as Social Skills groups and peer networks, appear valuable. However, awareness programs such as Special Friends or Circle of Friends appear inadequate in themselves, without providing more specific training for peers as to how to actively facilitate social interactions with students with AS. This training, in the case of students with AS, should focus on verbal scripts, written then faded, that address a range of specific pragmatic situations (making a date, inviting a friend to play a game, asking for help, etc.). Individual, more traditional speech therapy to address prosodic difficulties, and to establish self-monitoring routines should also be considered.

It is important for clinicians to note that some of the best-known social skills programs, such as Social Stories and Do-Watch-Listen-Say, have the least empirical support; while the best scientific evidence available supports the efficacy of many older but lesser known curricula, such as Play Organizers or Buddy Skills Training. This fact should alert us to the importance of "waiting until the facts are in" before adopting a highly touted new program. There are a good number of approaches to social skills training that have proven their

effectiveness and that merit wider adoption in the educational programs of children with AS and other ASDs.

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