

Social and Language Development Interventions Regarding Adolescents with Autism Spectrum Disorder

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Otizm Spektrum Bozukluğu Olan Ergenlere Yönelik Sosyal Beceri ve Dil Gelişimi Müdahaleleri

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Abstract

Every person with autism spectrum disorder (ASD) is unique and faces challenges with communication, repetitive behaviors, and social interaction. Speech and language development are among the key areas affected by ASD. Speech therapy plays a crucial role in the lives of individuals with ASD. Communication is central to human interaction, and people with ASD often struggle to effectively express their needs, thoughts, and feelings. This paper explores the importance of speech language and social skills improvement for adolescents on the autism spectrum, focusing on the goals and techniques that help them overcome communication barriers. The improvements in these areas enhance social interactions, boost academic performance, and increase independence. The paper also discusses considerations for designing intervention programs for individuals with ASD and provides recommendations for practice. Moreover, recommendations for future research are provided.

Keywords: *Interventions, adolescents, social development, language development, autism.*

Öz

Otizm spektrum bozukluğu (OSB) olan her birey benzersizdir. Ancak, bu bireylerin birçoğu iletişim, tekrarlayan davranışlar ve sosyal etkileşim konularında farklı düzeylerde zorluklar yaşarlar. Konuşma ve dil gelişimi, OSB'den etkilenen temel alanlar arasındadır. Dil ve konuşma terapisi, OSB olan bireylerin yaşamlarında çok önemli bir rol oynar. İletişim, insan etkileşiminin merkezinde yer alır ve OSB'li bireyler genellikle ihtiyaçlarını, düşüncelerini ve duygularını etkili bir şekilde ifade etmekte zorlanırlar. Bu makale, iletişim engellerini aşmalarına yardımcı olan hedef ve tekniklere odaklanarak, OSB olan ergenler için konuşma dili ve sosyal becerilerin geliştirilmesinin önemini incelemeyi amaçlamaktadır. Dil ve konuşma alanında yaşadıkları gelişmeler OSB olan bireylerin sosyal etkileşimleri geliştirir, akademik performansını destekler ve bağımsızlığını artırır. Makalede ayrıca OSB olan bireylere yönelik müdahale programlarının tasarlanmasında dikkat edilmesi gereken hususlar tartışılmakta ve uygulamaya yönelik öneriler sunulmaktadır. Ayrıca, gelecekteki araştırmalar için öneriler de sunulmaktadır.

Anahtar Sözcükler: *Müdahaleler, ergenler, sosyal gelişim, dil gelişimi, otizm.*

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Introduction

Language is the main channel for social interaction (Maynard & Turowetz, 2013). It is a sophisticated and multidimensional type of communication, to express thoughts, ideas, emotions, and information. It is a key component of human culture, allowing people to communicate and comprehend ideas within a group. While it is most frequently used to refer to spoken, written, or signed forms of communication, there are alternative ways that can also be considered as a language (Beukelman & Light, 2020; Emmorey, 2013). ASD is the world's most rapidly expanding developmental neurobiological condition (Senouci, 2021). It affects approximately one out of every 36 children and males are four times more likely than females to be diagnosed with autism (Maenner, 2023). Although the medical world uses the term "autism" to describe a disorder or a disability, many believe that autistic persons are neurodiverse (Murdock, 2020a). According to this perspective, autism is a difference, not a "disability". Every autistic person is unique facing certain and different communication difficulties in expressive and receptive language, in social interaction, as well as in behavioral abilities (American Psychiatric Association, 2013a; Cummins et al., 2020). Some of them may not speak at all, while others may not have any issue speaking. These challenges can make it difficult for them to form friendships or keep relationships at work or school and have a negative impact even on their physical and mental health (Cummins et al., 2020).

Numerous studies demonstrate that adolescents with ASD struggle with a variety of social and language skills. They find it difficult to talk to peers, make eye contact, express appropriate emotion, read nonverbal cues (Barbaro & Dissanayake, 2012; Bölte et al., 2010; Orsmond et al., 2013), and other abilities that all contribute to issues with reciprocal interactions (Paul et al., 2008). They also struggle to understand nonliteral languages like metaphors and humor (Krasny et al., 2003), and they frequently react inappropriately (Bellini, 2007). However, unresolved social communication issues that many adolescents with ASD face can negatively impact social acceptance, academic performance, career chances, and general wellness (Bellini et al., 2007). The importance and value of social inclusion are also stressed by the parents of adolescents with ASD (Kretzmann et al., 2015).

The life trajectory for every person with ASD is different. Only a portion of persons with ASD attain significantly effective results, such as living independently and having secure jobs (Howlin & Magiati, 2017). In this direction, socialization, communication, and daily living skills are particularly significant (Burger-Caplan et al., 2017). Socialization indicates the capacity to function well in social settings. Communication skills involve the capacity to share information during social exchanges (Sparrow & Cicchetti, 1985). Daily living skills (DLS) encompass various behaviors and abilities, including personal hygiene, money management, cooking, and time management (Baker et al., 2021).

The growth and maturation of a person with autism do not guarantee the improvement of their social skills and communication abilities. During the teenage years, individuals typically experience improvement in personal care, housekeeping, and meal-related activities. Nevertheless, there is no assurance that they will attain the same degree of independence when they reach maturity (Smith et al., 2012). The rate of change is anticipated to decrease as individuals enter their early 30s. On the other hand, literature indicates positive or negative effects of age on outcomes measures of social relationships or comorbid emotional symptoms (Choque Olsson et al. 2017; Hong et al., 2018). Finally, the early behavioral intervention has been demonstrated to reduce irritability and hyperactivity issues as individuals age (Anderson et al., 2011).

Over the past decade, researchers focused on designing intervention programs to help adolescents with mild forms of ASD improve their social skills (Reichow & Volkmar, 2010). However, the vast majority of those intervention programs involved working with children (Chang & Locke, 2016) whereas relatively few pertinent studies have attempted to address the social requirements of adolescents with ASD (Koegel et al., 2013). According to the findings of the latter research, these interventions are successful in improving the social skills of the aforementioned participants, but they have not allowed them to generalize their newly acquired skills to new contexts. Only investigations carried out in educational settings have successfully generalized newly taught skills (Pahnke et al., 2013).

This paper will discuss some of the most popular interventions for adolescents with ASD, focusing on the objectives and techniques that help them overcome communication challenges, enhance social interactions, and boost their academic performance. Thus, the purpose of this study is to provide a comprehensive overview of the different strategies and approaches that have been proven effective in supporting adolescents with ASD. By highlighting the specific goals and methods of these interventions, professionals and caregivers will be better equipped to tailor their support to the individual needs of each adolescent. Ultimately, the goal is to improve the overall quality of life and success of adolescents with ASD as they navigate the challenges of adolescence and prepare for adulthood.

Method

In the beginning, a review of the literature was carried out using PubMed and Google Scholar to locate pertinent studies. The search phrases utilized were "Social", "Language Development", "Interventions", "Adolescents," "ASD", or "autism". Author names and reference lists were used to find relevant references. After that, the studies were carefully analyzed to determine the most effective interventions for promoting social and language development in adolescents with ASD. The findings revealed a variety of strategies, including social skills training, speech therapy, and cognitive behavioral therapy, that have shown promising results in improving communication and social interactions in this population. In the next step, a group of criteria was applied to determine the effectiveness of the interventions and their impact on improving social interactions in this population. The main criteria were implementation settings, evidence-based status, individualization, social integration, generalization of skills, and cultural sensitivity. Four interventions were found to meet the above criteria: Picture Exchange Communication System, Peer-Mediated Interventions, Social Stories, and Script Fading.

Table 1 provides a comparative overview of PECS, Peer-Mediated Interventions, Social Stories, and Script Fading, highlighting their applications, similarities, and differences across various dimensions such as target population, core components, implementation settings, evidence-based status, individualization, social integration, training and support, generalization of skills, and cultural sensitivity.

Interventions

Picture Exchange Communication System (PECS)

Augmentative and Alternative Communication Systems (ACC) are a powerful way to improve the communication skills of individuals with autism, especially when there is a lack of speech or when the speech needs reinforcement (Syriopoulou-Delli & Eleni, 2021). AAC systems include but are not limited to visual or picture-based communication systems, modified sign language, and speech-generating devices (Ogletree et al., 2007).

Table 1. Social and Language Development Interventions

Aspect	PECS	Peer-Mediated Interventions	Social Stories	Script Fading
Target Population	Individuals with ASD	Individuals with ASD	Individuals with ASD	Individuals with ASD
Communication Focus	Augmentative and alternative communication	Social interaction and communication skills	Understanding social situations and behaviors	Enhancing conversational skills
Core Components	Picture exchange, communication book, training	Peer modeling, reinforcement, structured activities	Narrative structure, personalized content, and visual supports	Gradual reduction of prompts and cues
Implementation Settings	Home, school, therapy settings	Classroom, social settings, community	Various settings depending on social context	Speech therapy, educational settings
Evidence-Based	Yes	Yes	Yes	Yes
Individualization	Tailored to individual needs and abilities	Tailored to individual and group dynamics	Tailored to individual interests and experiences	Tailored to individual communication goals
Social Integration	Promotes social interaction and engagement	Facilitates peer relationships and inclusion	Enhances understanding and acceptance in social groups	Facilitates participation in social settings
Training and Support	Requires training for users and caregivers	Requires training for peers and educators	Guidance for creation and implementation	Requires support from speech therapists, educators
Generalization of Skills	Supports generalization to various contexts	Encourages generalization to natural settings	Facilitates transfer to real-life situations	Promotes independence in diverse settings
Cultural Sensitivity	Can be adapted to different cultural contexts	Can be implemented with consideration for cultural diversity	Can incorporate cultural themes and perspectives	Can be tailored to cultural norms and values

The (PECS) is a visual AAC system and protocol (Frost & Bondy, 2002). It was created to educate children with ASD and help them form new behaviors. The PECS is a functional training method for nonverbal symbolic communication. The one-to-one relationship between PECS symbols and objects, people, and ideas reduces the amount of uncertainty

in communication (Ganz et al., 2012) and makes it possible to recognize meaning rather than having to recall it (Heflin, 2007). This suits well to learners with ASD who are more likely to be highly visual learners (Trembath et al., 2015), making PECS particularly effective for use with ASD adolescents (Zink et al., 2018).

Research has well established the success of PECS. Hart and Banda (2009) conducted a systematic evaluation of 13 previously published single-subject research to assess the effectiveness of PECS, its effects on speech and problem behaviors, generalization outside of training circumstances, and the social validity of the intervention. The results revealed that, except for one participant, PECS led to improvements in functional communication enhancing some people's speaking and reducing troublesome behaviors. In addition, Flippin et al. (2010) conducted three group studies with a sample of 95 PECS participants and eight single-subject experiments. The findings led to the conclusion that PECS is a promising strategy for improving communication in ASD children aged 1 to 11 years.

In comparison to speech-generating devices (SGDs) or other more sophisticated kinds of AAC PECS appear to be more practical because they are less expensive, more robust, and easier to carry (Ganz et al., 2012). Furthermore, according to studies, PECS may be more helpful for some learners than other AAC methods (Ganz et al., 2012; Hart & Banda, 2010). Additionally, a recent meta-analysis of PECS, speech-generating devices (SGDs), and other picture-based AAC systems revealed that PECS was much more successful than other picture-based AAC systems, albeit it was roughly equal to SGDs in terms of effectiveness (Ganz et al., 2011).

PECS is undoubtedly a successful method for improving communication in students with ASD, according to general empirical evidence regardless of their type of diagnosis, age, or communication skill level (Flippin et al., 2010; Tincani & Devis, 2010). Furthermore, PECS training can enhance their socio-communicative skills in the long term (Lerna et al., 2014). However, there are still several important difficulties that need to be addressed, such as the results of PECS depending on the training of the implementers, and other cultural factors.

Practitioners as well as parents can serve the role of PECS implementers. ASD children's social and communication skills development depends a lot on their parents since they are the most significant individuals in their lives. When parents are trained to use PECS, children may receive more consistent advantages without incurring additional costs. Besides, parents may considerably enhance their children's targeted communicative responses in everyday situations (Park et al., 2010). On the other hand, teaching assistants, pre-service teachers, special education teachers, direct care employees, and language therapists are examples of practitioners who can also play the role of PECS implementer (Homlitas et al., 2014).

According to the literature, most of the cases in which parents or professionals treated people with ASD using PECS resulted in beneficial and successful outcomes (Homlitas et al., 2014; Park et al., 2010). However, according to Bondy and Frost (2001), "the continued success of PECS also will depend on the quality of training provided by those implementing the system" (p. 742). Effective PECS implementation training programs for parents and practitioners include verbal and written explanations, videos, modeling exercises, practice sessions, and feedback (Chaabane et al., 2009; Homlitas et al., 2014; Lerna et al., 2014). However, the proper educational elements are still unclear when training implementers to serve as PECS communication partners.

There are many different training models available for teaching adult partners to utilize PECS performance skills. Besides, it is challenging to detect a particular instructional strategy with higher levels of success. Amongst all these, a behavioral skills

training (BST) approach is suggested (Parsons et al., 2012). During this approach, trainees upheld high standards of quality when taught individually and in small training groups (McCoy & McNaughton, 2018). At this point, there isn't enough evidence to reach definite conclusions about the best combination of group and individualized training, although it would seem vital to include at least some individualized instruction (McCoy & McNaughton, 2018). Additionally, it is critical to keep in mind that educational practitioners have a finite amount of professional development time each year (Morrier et al., 2010), and there is a high turnover rate in the field of special education (Cook & Boe, 2007). For these important reasons, training instructions must not only be successful, but also efficient. In this direction, pyramidal training could be used to increase effectiveness. In this method, an experienced professional first instructs a small group of students, who then train another set of practitioners (Pence et al., 2013). According to Martocchio and Rosales (2016), the adoption of a pyramidal approach to PECS training ends up with encouraging outcomes.

Finally, the cultural context plays a crucial role in the effectiveness of PECS implementation. The vast majority of the studies refer to the application of PECS in Western cultural contexts. As a result, the investigation of PECS in the lives of children with ASD in non-Western societies has been unresearched (Hume et al., 2021). However, neurotypical and communication-impaired children's communication skills are influenced by local cultural attitudes and beliefs (Heward et al., 2017). Therefore, the PECS training program should take into account the regional context and different cultural perspectives to improve children's growth (Safi et al., 2022).

Peer-Mediated Interventions (PMIs)

Peers play a crucial role in influencing teenage development and are increasingly significant. As teenagers move towards independent adult functioning, peer relationships become the most significant socializing effect on their behavior and values (Gullotta et al., 2003). According to Rubin et al. (2007), interactions between peers are part of a complex social system that includes relationships between individuals, social exchanges, groups, and culture. Peers foster good feelings such as belonging, self-efficacy, and goal orientation (Martin & Dowson, 2009). This in turn helps students adjust academically. Peers give psychological and instrumental resources by generating social worth (Crosnoe et al., 2003). Additionally, they are a key element in academic achievement (Furrer & Marchand, 2020). However, academic achievement can be enhanced by functioning peer interactions while it can be harmed by bullying, coercion, and participation in antisocial peers (Wang & Eccles, 2012).

School contexts provide adolescents with unique and challenging social experiences, and they are also excellent settings for the integration of social interventions (Carter, 2017). As adolescents spend a significant amount of time at school, it is crucial to assess the effectiveness of interventions within this setting. (PMIs) in the school context, are beneficial in improving the social skills of adolescents with mild forms of ASD. According to Chan et al. (2009), PMI is a formal and ongoing experience in which peers with typical development are instructed or led by an adult to carry out behavioral interventions, and instructional programs to promote social interactions for students with disabilities. Peer partners serve as role models for appropriate behavior, aid in the acquisition of new skills, and encourage the adoption of new behaviors during learner-initiated and teacher-directed activities (Carter et al., 2014). Peers can be trained to advance communicative competence through communication device interventions (Biggs et al., 2017), provide

instruction on academic content (Jimenez et al., 2012), and foster social connections inside and outside of the classroom (Copeland et al., 2004).

Despite differences, all peer-focused strategies have a few essential elements, such as participant identification, participant teaching, and training, offering opportunities for interaction, adult support, and measurement of student development (Carter et al., 2014). Moreover, successful PMIs include some important determinants such as the generalization and preservation of adolescents' skills. Bellini et al. (2007), stated in their meta-analysis of school-based social skills interventions that the success of a social skills intervention should be evaluated on the degree to which the skills generalize across a range of situations and with various persons. In this direction initiating, prompting, and reinforcing techniques such as direct instruction in social skills, visual supports, pivotal response training, self-monitoring, and participant interest-driven activities can produce successful generalization and maintenance outcomes (Watkins et al., 2015).

Another metric of particular significance to PMI is social validity. Practitioners, participants, and peers in all studies with social validity expressed high levels of satisfaction with the PMI (e.g., Hughes et al. 2013). Social validity is connected with the participants' satisfaction concerning their positive experiences and outcomes. It is also related to the likelihood that these interventions will continue to be implemented (Kennedy 2002).

Finally, effective peer training is crucial to facilitating peer learning. According to Bambara et al. (2018), four basic steps can be used by teachers to introduce peer training. First of all, peers should be introduced to their new position. Therefore, teachers should hold an orientation meeting before peer training so that peers can understand more about the tasks they will be performing, the training they will get, and the support they can receive from a teacher or other team members. Secondly, teachers should use explicit instruction when teaching PMI tactics to peers for the first time. Teachers must give a thorough explanation, justification, and demonstration of how a strategy should be utilized during the conversation if they want the strategies to support discussion and for each approach to promote the targeted skills. During the third step, peers should be instructed to utilize the methods during a conversation with the focus student in a natural situation after they have had a chance to practice utilizing them in role-play. The target student will already be familiar with using visual supports and will be ready to accept help from peers whenever it is required. This is the fourth step. As soon as the focal students respond properly to the peers' efforts and they have demonstrated their ability to apply the tactics successfully in the real world, the intervention can be turned over to the peers, and daily supervision and feedback are no longer needed. However, the progress of the focus student and whether peers are still employing their tactics should also be monitored by teachers regularly.

Social Stories

Social stories are another way of teaching social skills. They consist of short stories whose purpose is to explain the condition and not so much to direct (Gray, 2004). Guidelines regarding their style and format have changed over time (Camilleri et al., 2023). The instructions for creating social stories have now advanced to their third version. They can help adolescents with ASD recognize social situations by identifying proper behavior, explaining it, and giving examples of suitable answers (Gray & Garand, 1993). They refer to socially acceptable ways of behaving depending on the circumstances helping adolescents accurately comprehend specific social facts in a given environment or situation (Wright & McCathren, 2012).

The current rules for creating Social Stories include ten criteria (Camilleri et al., 2024). Gray's first criterion emphasizes the importance of authors connecting with the audience's experiences and perspectives of the world. The second criterion promotes the identification of pertinent information on the audience and the specific topic of the Social Story. The third criterion specifies the structure of each narrative. It requires giving a clear title and making sure that each story includes an introduction that introduces the issue, a body that provides detailed information, and a conclusion that reinforces the content. The third criterion also outlines the two sorts of sentences that stories should include. Grey uses "Descriptive Sentences" to convey the relevant component of a context without making any judgment. In addition, he utilizes "Coaching Sentences" to gently direct the audience. The fourth requirement specifies that each story should be tailored to match the audience's attention, learning style, and interests. The sixth requirement stresses the importance of stories having a helpful tone, recommending that they be written in either the first or third person. The sixth criterion states that a story should answer essential 'who,' 'what,' 'when,' 'where,' 'why,' and 'how' inquiries. Criterion seven mandates that fifty percent of narratives should be tailored for a particular individual to celebrate and commend. Moreover, each story must have three times as many descriptive sentences as coaching sentences according to the eighth criterion. Finally, the ninth and tenth criteria emphasize the continuous process of improving and enriching the story.

Literature indicates that many types of behaviors can be improved through the utilization of Social Stories. To begin with, Social Stories can enhance adolescents' social engagement (Litras et al., 2010), conversational skills (Ali & Saad, 2016), reciprocal interactions (Thiemann & Goldstein, 2001), social communication (Sansosti & Powell-Smith, 2008), self-regulation (Thompson & Johnston, 2013), verbal greeting initiations (Reichow & Sabornie, 2009). They can decrease socially inappropriate and undesirable behaviors (Adams et al., 2004), and reduce problem behaviors (Pasiali, 2004). Additionally, social stories promote flexibility by reducing the anxiety level of autistic children when their school schedule is altered (Irvan & Syafitri, 2023). Finally, they can help adolescents with ASD to develop acceptable, self-management of eating behavior (Mohammed & Mostafa, 2012).

As literature supports Social Stories can assist people with ASDs in gaining and retaining desired social-emotional abilities (Sansosti & Powell-Smith, 2008). Yet, according to empirical findings Social Stories by themselves may not always be sufficient to increase desired behaviors and decrease undesirable ones (Ledford & Wolery, 2013). Using them in conjunction with other teaching methods like peer modeling or teacher prompts results in more positive effects (Dev, 2014). In this direction, several researchers have investigated the combination of video modeling and Social Stories. Sansosti and Powell-Smith (2008) used a computer-based format to present video-modeled Social Stories. Their target was to enhance the social communication skills of three high-functioning autistic children. In the beginning, a computer program read aloud the content of the personalized Social Stories. After that, a peer of a similar age modeled the specific content. Children viewed their Social Story video once a day in their school environment, just before the targeted event. According to the findings of the study, video-based Social Stories were effective at increasing participants' social communication rates. Furthermore, there is also research on the utilization of Social Stories along with music. Pasiali (2004) investigated the effects of social stories set to music on problem behaviors in three children with ASD, ages seven to nine. The tune of the song used was very familiar to the child. As it was found, the musical social stories had an immediate effect on reducing children's problem behaviors. It was also remarkable that in two of the three cases, the

behavior did not return when the intervention was removed. In other words, the targeted behavior continued to decline across all phases of the single-subject design study, indicating that the treatment resulted in a change in learned behavior.

Years of studies have emphasized the need to offer practitioners continual training to support adolescents with ASD more effectively (Dev, 2014). First of all, practitioners wishing to employ Social Stories to adolescents with ASD can work with instructors to identify the social and communication skills they wish to target. These may consist of conversational skills, reciprocal interactions, social communication, self-regulation issues, etc. The one-size-fits-all model is already obsolete. Each student with autism is unique and what works for one student may not work for another (American Psychiatric Association, 2013b; Cummins et al., 2020). Therefore, at the next step, it is important to encourage teachers to observe and collect information about each student's interests, strengths, and improvement areas to create more meaningful and pertinent stories. Social Stories must be adapted to the specific requirements of each adolescent with ASD. After that, it is crucial to train the professionals on how to effectively compose Social Stories. They should be aware of how to a) set the context and explicitly describe the situation with descriptive sentences, b) describe the student's sentiments, thoughts, and emotions c) provide suggestions for acceptable responses or actions, and finally d) reinforce favorable outcomes and proper conduct. It is also important to assist educators in embedding visual aids, such as images or symbols, into the Social Stories. Visual aids improve comprehension and provide additional learning signals for adolescents with ASD (Trembath et al., 2015). Reading the stories with the students regularly, both individually and in groups, is a good practice to reinforce the desired skills. However, professionals should be flexible in implementing Social Stories in the classroom (Irvan & Syafitri, 2023). Thus, if a specific story or approach is not producing the intended results, they should be equipped to make the necessary adjustments. For that, they should be educated on how to observe the students' responses and progress.

In addition, it is of great importance to stress the significance of collaboration between teachers and parents with other professionals, such as speech therapists. This collaboration can result in a holistic approach to fostering the social development of the student (Dev, 2014). It is also vital to provide opportunities for teachers to receive feedback and support on their performance during the employment of Social Stories enhancing practitioners' confidence in utilizing this intervention technique more effectively. Furthermore, professionals should be encouraged to continue their training (Robinson et al., 2016), and keep informed about the most recent research and best practices in the field of autism and Social Stories. This ongoing education will assist them in honing their skills and enhancing their support for students with ASD.

Finally, it is crucial to celebrate the progress and accomplishments of both instructors and students as they grow and develop together. Even minor accomplishments deserve recognition. As it turns out, there is truth to the aphorism "success breeds success" (van de Rijt et al., 2014). As teachers and students realize success in achieving their objectives, it is crucial to celebrate their achievements. In that way, students will be motivated to strive for greater success, and instructors will be encouraged in their efforts to help all students achieve their goals when their efforts are acknowledged.

Script-Fading

Written scripts are another way of guiding the person with autism to develop speech and social interaction (McClannahan & Krantz, 2005). This intervention teaches verbal communication skills by instructing individuals with autism to read aloud lines from a

written script. The term "script-fading" is probably taken from the art of acting. When actors have to memorize lines they read the entire script out loud, which is likely why Krantz and McClannahan (1993) coined the term to characterize it. The scripts used with this method are frequently taught to students in a meaningful context. As students become more adept at reading their script, the written prompt is systematically diminished by removing some of the words from the paper as they become more fluent. Scripts serve as triggers or cues for children with ASD to produce words or phrases that have been specifically taught. Scripts frequently include phrases designed to increase initiations in particular contexts, such as entertainment or lunchtime. The script's length differs depending on the child's skill level (Akers et al., 2015). Because there is a desired or reinforcing response for every spoken word, it is expected that students will replicate the verbal behaviors they have learned in context. An example of a fading script is: "The sky is blue today", "The sky is blue ___", "The sky is ___ ___", "The sky ___ ___ ___", etc. The final word in the script is omitted until the script is completely diminished or eliminated. Alternatively, when a script is not completely faded, a few words remain to help out the person with ASD.

A growing number of studies have demonstrated the efficacy of the script fading procedure. This procedure is an effective method for teaching adolescents with autism to exchange information about objects and pictures with others. It is also effective for teaching conversational skills that can be applied to new objects and images (Tedoff, 2009). According to Kahveci (2022), as the scripts fade, persons with autism get into the process of starting a conversation on their own, and a generalization of this skill is observed. The efficacy of the script fading procedure is established in teaching various skills, such as manding (Betz et al., 2011), developing empathy (Argott et al., 2008), interaction (Akers et al., 2018), and distinguishing between emotions (Elicin & Avcioglu, 2014).

According to Ganz (2007), the script-fading procedure is more effective when professionals follow seven stages. First of all script interventions are more efficient when the intended activity is one that the student enjoys and is motivated to participate in. So in the beginning, it is very helpful for the practitioner to know the student's interests and select a target activity accordingly. In the second step, it may be beneficial to observe the adolescent's typically developing companions on at least three separate occasions. During these occasions, it is important to note in exact detail their comments, how they initiate conversations, the queries they ask, and the topics of their conversations. In the third step, it is crucial to explore the child's individualized education program to determine one or more specific, measurable learning objectives before writing the script. The student's ability level should also be taken into account. According to Ganz (2006), the duration and complexity of a script are dependent on the student's skill level. Consequently, at the fourth step, it is useful to produce a list of sentences or phrases that the student will learn to use during the social activity, based on information garnered from observing typically developing peers participating in the activity of choice. The fifth step refers to the teaching of the script. Depending on the reading ability of the student, the entire script may be taught in one or several days. The student must be able to recite the sentences or phrases of the visual script fluently. The sixth step includes the execution of the script during the objective activity (Ganz, 2006; Krantz & McClannahan, 1993). Scripts may be written on note cards or paper and include a way for the student to keep track of phrases, such as check-off boxes next to each phrase. The seventh and final step is about diminishing the script. Normally, the script should gradually fade. However, if the student primarily relies on visual cues, the script may remain. The script fading procedure can be completed in a

series of stages. Krantz and McClanahan (1993) suggest removing the script piece by piece, first by removing punctuation at the end of sentences, then by removing portions of phrases, beginning at the end, until only bullets and tick boxes remain. Depending on the student's memory abilities, script fading can occur during a lesson or over weeks (Ganz, 2006).

Discussion

Literature underlines the close relationship between language development and social functioning (Davis & Qi, 2020). Negative outcomes in language development may provoke mild deficiencies in communication skills (van der Wilt et al., 2019). On the other hand, poor social skills provide fewer opportunities for social interaction and chances to practice linguistic-communicative skills, which in turn affect language development (Hofmann & Müller, 2021). Children and adolescents with ASD confront a high rate of social and language difficulties which are very closely related to their emotional and behavioral needs (Helland & Helland, 2017). Nonetheless, unresolved social communication issues can harm their career opportunities, overall health, social acceptance, and academic performance (Bellini et al., 2007). Thus, designing intervention programs for adolescents with ASD is of great value.

As the literature indicates there are insufficient foundational elements when designing an intervention for adolescents with ASD (Pervin et al., 2022). However, intervention programs designed to improve their social and language skills could rest on six specific pillars. First of all, it is critical to remember that every adolescent with ASD is unique. Thus, it is very important to encourage teachers to observe and collect information about each student's interests, strengths, and improvement areas to create more meaningful and pertinent interventions. Secondly, detecting a particular instructional strategy for every intervention with higher levels of success is vital. According to a review of the literature on training and strategy, it is evident that developing a training program concurrently with the organization's strategy is essential to achieving the desired objectives (Dean et al., 2020). Training theories can assist professionals in adopting the most effective training approach. It is essential to select the appropriate training delivery method based on the work's nature and the organization's goals. It is also necessary to note that successful organizations typically invest more in training than unsuccessful ones (Kraiger, 2003). Thirdly, it is important to keep in mind that parents can serve as intervention implementers. Parents are the most significant individuals in the lives of children and adolescents with ASD and carry a huge caregiving burden (Picardi et al., 2018). Thus, their social and communication skills development depends a lot on them. Parents can significantly improve their children's communicative responses in everyday situations (Park et al., 2010). If parents are trained to implement an intervention, children may experience more consistent benefits at no additional cost. The fourth pillar refers to the professional development of parents and practitioners. Throughout the intervention's implementation, it is essential to provide opportunities for receiving feedback and support on their performance. This will increase their confidence in employing this intervention technique effectively. In addition, parents and practitioners should be encouraged to continue their training (Robinson et al., 2016) and to stay abreast of the latest research and best practices in the field of autism interventions. This continuing education will assist them in refining their abilities and bolstering their support for students with ASD. The social and ecological validity of the intervention forms the fifth pillar. Social validity is related to the participant's satisfaction with their

favorable experiences and outcomes. It is also associated with the probability that these interventions will be continued (Kennedy, 2002). In this direction, local cultural attitudes and regional context are elements that should be taken into account in intervention training programs since they influence ASD children's communication abilities (Heward et al., 2017). Researchers suggest that future investigations of social skills intervention should ask adolescents with and without ASD to rate the intervention's social validity (Dean et al., 2020). On the other hand, ecological validity has been defined as the extent to which the findings of a research study can be applied in the context of everyday life (Ledford et al., 2015). It is important to assess the ecological validity of function-based interventions and provide future research areas for their implementation and continued usage by teachers and implementers (Chezan et al., 2020). Lastly, the sixth pillar refers to the recognition of the growth and achievements of both instructors and students as they develop together. Even minor achievements merit acknowledgment and celebration. As it turns out, the adage "success breeds success" is accurate (van de Rijt et al., 2014).

Conclusion

In conclusion, this article provides a comparative overview of PECS, Peer-Mediated Interventions, Social Stories, and Script Fading, highlighting their applications, similarities, and differences across various dimensions and criteria. This fills a gap in the literature by specifically focusing on interventions for adolescents with autism, a population that has unique needs and challenges. The common results of these interventions show promising outcomes in improving communication and social skills. Moreover, this article was needed to provide a comprehensive framework for understanding the pillars of effective teaching in special education, specifically for adolescents with ASD. Common results of applying these pillars include increased motivation, engagement, and overall success in the academic and social development. The strengths of this study include its clear framework, its comprehensive review of multiple interventions and practical strategies, and its focus on a specific population, while its weaknesses may lie in the need for further empirical evidence to support the effectiveness of these pillars in practice. Overall, this article contributes valuable insights into effective interventions for adolescents with autism and emphasizes the importance of tailoring interventions to meet the individual needs of this population.

Recommendations for Practice and Future Research

Successful social interactions frequently predict future success in other areas such as work, higher education, and romantic relationships. Therefore, social skill development is one of the most crucial areas for adolescent students (van Loon et al., 2019). Following the proposal of the six pillars model may prove to be a useful guide for those in charge of promoting the education and development of children with ASD. Special consideration should be given to developing precise criteria, contextual knowledge, and new educational pathways. This could serve as a baseline for assessing ASD intervention programs with exact metrics and elements.

Taking into account the proposal of the six pillars educators, therapists, and caregivers can apply in practice the following recommendations to effectively support the communication, social interaction, and independence of adolescents with ASD. To begin with as far as PECS is concerned implementers should conduct a thorough assessment to identify the individual's communication needs and preferences. They could start focusing on teaching the individual to exchange a single picture for a desired item or activity. It is essential to use highly motivating items or activities as incentives for communication exchanges (Müller et al., 2016). Thus, they can gradually expand the individual's

vocabulary by introducing new symbols and teaching more complex communication functions, and foster independence by gradually fading prompts and encouraging self-initiated communication exchanges. On the other hand, when it comes to PMIs it is crucial to identify peers who can serve as communication partners and social models for the individual and provide them with training on how to support and interact with the individual with autism (Bambara et al., 2018). Some structured activities and social situations could be utilized to facilitate positive interactions and communication exchanges between the individual and peers. During the intervention, it is necessary to use positive reinforcement and praise for encouragement (van de Rijt et al., 2014) and provide feedback to peers on their interactions with the individual, reinforcing effective strategies and providing guidance as needed. For the implementation of Social Stories, the creation of personalized stories tailored to the individual's specific social challenges and situations is vital. Besides this, the implementers should use clear and simple language, visual supports, and concrete examples to illustrate social expectations and appropriate behaviors. Incorporating the individual's interests and preferences into the Social Stories is a good practice to increase engagement and relevance. In addition, the individual needs to practice and generalize social skills in real-life situations, with support and feedback as needed (Olcay-Gül & Tekin-Iftar, 2016). Finally, educators, therapists, and caregivers who wish to use Script Fading could start with scripted prompts or cues to support the individual in initiating and maintaining conversations or interactions. They can gradually reduce the level of support over time by fading out the scripted prompts. They can also provide scaffolding and reinforcement to encourage the individual to generate their responses and initiate interactions independently (Matos et al., 2019). It is helpful for the individual to gradually increase the complexity and variability of interactions by breaking down communication skills into manageable steps and using visual supports and reminders for support during the fading process. Monitoring progress and reinforcing successful attempts at independent communication is crucial.

However, the proper educational elements for the effectiveness of each intervention are still unclear. Therefore, more research is needed to raise insufficiency and draw more definitive conclusions about the most effective intervention, or the most effective combination of interventions for adolescents with ASD. It is also crucial to determine how to best choose the type of intervention according to specific participant characteristics (Chambless & Hollon, 1998). In that direction, future research could potentially focus on examining the effectiveness of group and individualized instruction (McCoy & McNaughton, 2018). Additionally, researchers could expand research to focus on several issues such as the effectiveness of a face-to-face approach versus an online training program both for professionals and students, as well as the effectiveness of different training techniques, such as practicing in multiple situations rather than just one. Researchers may also recommend implementing personalized learning plans for students, providing more professional development opportunities for teachers, or investing in resources such as tutoring programs or technology tools. Moreover, ongoing collaboration between researchers, educators, and policymakers is essential to ensure that research findings are translated into actionable strategies that can be effectively implemented in schools and classrooms. This collaborative approach can help bridge the gap between research and practice, ultimately benefiting students and the education system as a whole.

Finally, further research is still required to explore the potential benefits of large-scale research for the investigation of factors such as student attendance, classroom conditions, program duration, and intervention intensity. This research could provide

valuable insights into how these factors impact student outcomes and help educators make informed decisions about how to best support students in their academic endeavors. By analyzing data from a wide range of schools and programs, researchers can identify common trends and best practices that can be implemented to improve student success across different educational settings. As technology continues to advance, researchers may also be able to use innovative tools and methodologies to gather and analyze data more effectively, leading to more accurate and comprehensive findings. Additionally, conducting large-scale research would support the generalizability of the findings. Ultimately, a comprehensive understanding of these factors could lead to evidence-based strategies for improving student success and educational outcomes. The generalization and preservation of adolescents' skills is the final goal.

References

- Adams, L., Gouvousis, A., VanLue, M., & Waldron, C. (2004). Social Story intervention. *Focus on Autism and Other Developmental Disabilities, 19*(2), 87–94. <https://doi.org/10.1177/10883576040190020301>
- Akers, J. S., Higbee, T. S., Pollard, J. S., & Reinert, K. S. (2018). Sibling-implemented script fading to promote play-based Statements of children with autism. *Behavior Analysis in Practice, 11*(4), 395–399. <https://doi.org/10.1007/s40617-018-0257-5>
- Akers, J. S., Pyle, N., Higbee, T. S., Pyle, D., & Gerencser, K. R. (2015). A synthesis of script fading effects with individuals with autism spectrum disorder: A 20-Year Review. *Review Journal of Autism and Developmental Disorders, 3*(1), 1–17. <https://doi.org/10.1007/s40489-015-0062-9>
- Ali, M., & Saad, E. (2016). The effectiveness of Social Stories among children and adolescents with autism spectrum disorders: Meta-analysis. *International Journal of Psycho-Educational Sciences, 5*(2), 51–60. <https://files.eric.ed.gov/fulltext/ED594308.pdf>
- American Psychiatric Association. (2013a). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.
- American Psychiatric Association. (2013b). *Diagnostic and statistical manual of mental disorders: DSM-5-TR*. American Psychiatric Association Publishing.
- Anderson, D. K., Maye, M. P., & Lord, C. (2011). Changes in maladaptive behaviors from mid-childhood to young adulthood in autism spectrum disorder. *American Journal on Intellectual and Developmental Disabilities, 116*(5), 381–397. <https://doi.org/10.1352/1944-7558-116.5.381>
- Argott, P., Townsend, D. B., Sturmey, P., & Poulson, C. L. (2008). Increasing the use of empathic statements in the presence of a non-verbal affective stimulus in adolescents with autism. *Research in Autism Spectrum Disorders, 2*(2), 341–352. <https://doi.org/10.1016/j.rasd.2007.08.004>
- Baker, E., Stavropoulos, K. K. M., Baker, B. L., & Blacher, J. (2021). Daily living skills in adolescents with autism spectrum disorder: Implications for intervention and independence. *Research in Autism Spectrum Disorders, 83*, 101761. <https://doi.org/10.1016/j.rasd.2021.101761>
- Bambara, L. M., Thomas, A., Chovanes, J., & Cole, C. L. (2018). Peer-mediated intervention: Enhancing the social conversational skills of adolescents with autism spectrum disorder. *Teaching Exceptional Children, 51*(1), 7–17. <https://doi.org/10.1177/0040059918775057>

- Barbaro, J., & Dissanayake, C. (2012). Early markers of autism spectrum disorders in infants and toddlers prospectively identified in the social attention and communication study. *Autism*, 17(1), 64–86. <https://doi.org/10.1177/1362361312442597>
- Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A Meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education*, 28(3), 153–162. <https://doi.org/10.1177/07419325070280030401>
- Betz, A. M., Higbee, T. S., Kelley, K. N., Sellers, T. P., & Pollard, J. S. (2011). Increasing response variability of mand frames with script training and extinction. *Journal of Applied Behavior Analysis*, 44(2), 357–362. <https://doi.org/10.1901/jaba.2011.44-357>
- Beukelman, D. R., & Light, J. C. (2020). *Augmentative & alternative communication: Supporting children and adults with complex communication needs* (5th ed.). Paul H. Brookes Publishing Co., Inc.
- Biggs, E. E., Carter, E. W., & Gustafson, J. (2017). Efficacy of peer support arrangements to increase peer interaction and AAC use. *American Journal on Intellectual and Developmental Disabilities*, 122(1), 25–48. <https://doi.org/10.1352/1944-7558-122.1.25>
- Bölte, S., Westerwald, E., Holtmann, M., Freitag, C., & Poustka, F. (2010). Autistic traits and autism spectrum disorders: The clinical validity of two measures presuming a continuum of social communication skills. *Journal of Autism and Developmental Disorders*, 41(1), 66–72. <https://doi.org/10.1007/s10803-010-1024-9>
- Bondy, A., & Frost, L. (2001). The picture exchange communication system. *Behavior Modification*, 25(5), 725–744. <https://doi.org/10.1177/0145445501255004>
- Burger-Caplan, R., Saulnier, C. A., & Sparrow, S. S. (2017). Vineland adaptive behavior scales. *Springer EBooks*, 1–5. https://doi.org/10.1007/978-3-319-56782-2_1602-4
- Camilleri, L. J., Maras, K., & Brosnan, M. (2023). A rule-based theoretical account of social stories to address the double empathy problem. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1085355>
- Camilleri, L. J., Maras, K., & Brosnan, M. (2024). Effective digital support for autism: Digital social stories. *Frontiers in Psychiatry*, 14. <https://doi.org/10.3389/fpsyg.2023.1272157>
- Carter, E. W. (2017). Supporting the social lives of secondary students with severe disabilities: Considerations for effective intervention. *Journal of Emotional and Behavioral Disorders*, 26(1), 52–61. <https://doi.org/10.1177/1063426617739253>
- Carter, E. W., Bottema-Beutel, K., & Brock, M. E. (2014). Social interactions and friendships. In M. Agran, F. Brown, C. Hughes, C. Quirk, & D. Ryndak (Eds.), *Equity and full participation for individuals with severe disabilities: A vision for the future*. (pp. 197–216). Brookes Publishing.
- Carter, E. W., Gustafson, J. R., Sreckovic, M. A., Dykstra Steinbrenner, J. R., Pierce, N. P., Bord, A., Stabel, A., Rogers, S., Czerw, A., & Mullins, T. (2016). Efficacy of peer support interventions in general education classrooms for high school students with autism spectrum disorder. *Remedial and Special Education*, 38(4), 207–221. <https://doi.org/10.1177/0741932516672067>
- Chaabane, D. B.B., Alber-Morgan, S. R., & DeBar, R. M. (2009). The effects of parent-implemented PECS training on improvisation of mands by children with autism.

- Journal of Applied Behavior Analysis*, 42(3), 671–677.
<https://doi.org/10.1901/jaba.2009.42-671>
- Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, 3(4), 876–889.
<https://doi.org/10.1016/j.rasd.2009.04.003>
- Chang, Y.-C., & Locke, J. (2016). A Systematic Review of peer-mediated interventions for children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 27, 1–10. <https://doi.org/10.1016/j.rasd.2016.03.010>
- Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, 66(1), 7-18. <https://doi.org/10.1037//0022-006x.66.1.7>.
- Chezan, L. C., McCammon, M. N., Drasgow, E., & Wolfe, K. (2020). The ecological validity of research studies on function-based interventions in schools for children with autism spectrum disorder. *Behavior Modification*, 46(1), 202-229.
<https://doi.org/10.1177/0145445520964921>
- Choque Olsson, N., Flygare, O., Coco, C., Görling, A., Råde, A., Chen, Q., Lindstedt, K., Berggren, S., Serlachius, E., Jonsson, U., Tammimies, K., Kjellin, L., & Bölte, S. (2017). Social skills training for children and adolescents with autism spectrum disorder: A randomized controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(7), 585–592.
<https://doi.org/10.1016/j.jaac.2017.05.001>
- Cook, L. H., & Boe, E. E. (2007). National trends in the sources of supply of teachers in special and general education. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, 30(4), 217–232. <https://doi.org/10.1177/088840640703000402>
- Copeland, S. R., Hughes, C., Carter, E. W., Guth, C., Presley, J. A., Williams, C. R., & Fowler, S. E. (2004). Increasing access to general education. *Remedial and Special Education*, 25(6), 342–352. <https://doi.org/10.1177/07419325040250060201>
- Crosnoe, R., Cavanagh, S., & Elder, G. H. (2003). Adolescent friendships as academic resources: The intersection of friendship, race, and school disadvantage. *Sociological Perspectives*, 46(3), 331–352.
<https://doi.org/10.1525/sop.2003.46.3.331>
- Cummins, C., Pellicano, E., & Crane, L. (2020). Autistic adults' views of their communication skills and needs. *International Journal of Language & Communication Disorders*, 55(5). <https://doi.org/10.1111/1460-6984.12552>
- Davis, A. N., & Qi, C. H. (2020). A longitudinal examination of language skills, social skills, and behavior problems of preschool children from low-income families. *Topics in Early Childhood Special Education*, 40(3), 172-186.
<https://doi.org/10.1177/0271121420946104>
- Dean, M., Williams, J., Orlich, F., & Kasari, C. (2020). Adolescents with autism spectrum disorder and social skills groups at school: A randomized trial comparing intervention environment and peer composition. *School Psychology Review*, 49(1), 60–73. <https://doi.org/10.1080/2372966x.2020.1716636>
- Dev, P. C. (2014). Using social stories for students on the autism spectrum: teacher perspectives. *Pastoral Care in Education*, 32(4), 284–294.
<https://doi.org/10.1080/02643944.2014.974662>

- Elicin, O., & Avcioglu, H. (2014). Effectiveness of teaching via scripts and script fading methods for children with autism in acquiring the skill of discriminating emotions. *Education and Science, 39*(171), 317–330.
- Emmorey, K. (2013). *Perspectives on classifier constructions in sign languages*. Psychology Press.
- Flippin, M., Reszka, S., & Watson, L. R. (2010). Effectiveness of the Picture Exchange Communication System (PECS) on communication and speech for children with autism spectrum disorders: A meta-analysis. *American Journal of Speech-Language Pathology, 19*(2), 178–195. [https://doi.org/10.1044/1058-0360\(2010/09-0022\)](https://doi.org/10.1044/1058-0360(2010/09-0022))
- Frost, L., & Bondy, A. (2002). *PECS: The Picture Exchange Communication System: Training manual*. Pyramid Educational Consultants.
- Furrer, C. J., & Marchand, G. C. (2020). The adolescent peer system and academic engagement. *Educational Psychology, 1–20*. <https://doi.org/10.1080/01443410.2019.1706722>
- Ganz, J. B. (2006). *How to write and implement social scripts*. Pro-Ed.
- Ganz, J. B. (2007). Using visual script interventions to address communication skills. *Teaching Exceptional Children, 40*(2), 54–58. <https://doi.org/10.1177/004005990704000207>
- Ganz, J. B., Davis, J. L., Lund, E. M., Goodwyn, F. D., & Simpson, R. L. (2012). Meta-analysis of PECS with individuals with ASD: Investigation of targeted versus non-targeted outcomes, participant characteristics, and implementation phase. *Research in Developmental Disabilities, 33*(2), 406–418. <https://doi.org/10.1016/j.ridd.2011.09.023>
- Ganz, J. B., Earles-Vollrath, T. L., Mason, R. A., Rispoli, M. J., Heath, A. K., & Parker, R. I. (2011). An aggregate study of single-case research involving aided AAC: Participant characteristics of individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders, 5*(4), 1500–1509. <https://doi.org/10.1016/j.rasd.2011.02.011>
- Ganz, J. B., Simpson, R. L., & Lund, E. M. (2012). The Picture Exchange Communication System (PECS): A promising method for improving communication skills of learners with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities, 47*(2), 176–186. <http://www.jstor.org/stable/23880098>
- Gray, C. (2004). Social Stories: The new defining criteria and guidelines. *Jenison Autism Journal, 15*(4), 2–21.
- Gray, C. A., & Garand, J. D. (1993). Social Stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior, 8*(1), 1–10. <https://doi.org/10.1177/108835769300800101>
- Gullotta, T. P., Bloom, M., & Child. (2003). *Encyclopedia of primary prevention and health promotion*. Kluwer Academic/Plenum.
- Hart, S. L., & Banda, D. R. (2009). Picture Exchange Communication System with individuals with developmental disabilities: A meta-analysis of single subject studies. *Remedial and Special Education, 31*(6), 476–488. <https://doi.org/10.1177/0741932509338354>
- Heflin, J. (2007). *Students with autism spectrum disorders: Effective instructional practices*. Pearson/Merrill Prentice Hall.
- Helland, W. A., & Helland, T. (2017). Emotional and behavioural needs in children with specific language impairment and children with autism spectrum disorder: The

- importance of pragmatic language impairment. *Research in Developmental Disabilities*, 70, 33–39. <https://doi.org/10.1016/j.ridd.2017.08.009>
- Heward, W. L., Alber-Morgan, S. R., & Al, E. (2017). *Exceptional children: an introduction to special education*. Pearson.
- Hofmann, V., & Müller, C. M. (2021). Language skills and social contact among students with intellectual disabilities in special needs schools. *Learning, Culture and Social Interaction*, 30, 100534. <https://doi.org/10.1016/j.lcsi.2021.100534>
- Homlitas, C., Rosales, R., & Candel, L. (2014). A further evaluation of behavioral skills training for implementation of the picture exchange communication system. *Journal of Applied Behavior Analysis*, 47(1), 198–203. <https://doi.org/10.1002/jaba.99>
- Hong, J. K., Oh, M., Bong, G., Kim, J.-H., Bahn, G., Cho, I.-H., & Yoo, H. J. (2018). Age as a moderator of social skills intervention response among Korean adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 49(4), 1626–1637. <https://doi.org/10.1007/s10803-018-3859-4>
- Howlin, P., & Magiati, I. (2017). Autism spectrum disorder: Outcomes in adulthood. *Current Opinion in Psychiatry*, 30(2), 69–76. <https://doi.org/10.1097/ycp.0000000000000308>
- Hughes, C., Harvey, M., Cosgriff, J., Reilly, C., Heilingoetter, J., Brigham, N., Kaplan, L., & Bernstein, R. (2013). A peer-delivered social interaction intervention for high school students with autism. *Research and Practice for Persons with Severe Disabilities*, 38(1), 1–16. <https://doi.org/10.2511/027494813807046999>
- Hume, K., Steinbrenner, J. R., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2021). Evidence-based practices for children, youth, and young adults with autism: Third generation review. *Journal of Autism and Developmental Disorders*, 51(11). <https://doi.org/10.1007/s10803-020-04844-2>
- Irvan, M., & Syafitri, P. (2023). The flexibility of executive function: implementing Social Story for children with autism spectrum disorder. *Proceedings of the International Conference on Educational Management and Technology (ICEMT 2022)*, 593–599. https://doi.org/10.2991/978-2-494069-95-4_68
- Jimenez, B. A., Browder, D. M., Spooner, F., & Dibiase, W. (2012). Inclusive inquiry science using peer-mediated embedded instruction for students with moderate intellectual disability. *Exceptional Children*, 78(3), 301–317. <https://doi.org/10.1177/001440291207800303>
- Kahveci, G. (2022). Social skills interventions for children with autism spectrum disorder. *International Journal of Su-Ay Development Association (IJOSDA)*, 1(1), 33–40.
- Kennedy, C. H. (2002). The Maintenance of behavior change as an indicator of social validity. *Behavior Modification*, 26(5), 594–604. <https://doi.org/10.1177/014544502236652>
- Koegel, R., Kim, S., Koegel, L., & Schwartzman, B. (2013). Improving socialization for high school students with ASD by using their preferred interests. *Journal of Autism and Developmental Disorders*, 43(9), 2121–2134. <https://doi.org/10.1007/s10803-013-1765-3>
- Kraiger, K. (2003). Perspectives on training and development. *Handbook of Psychology*, 12. <https://doi.org/10.1002/0471264385.wei1208>
- Krantz, P. J., & McClannahan, L. E. (1993). Teaching children with autism to initiate to peers: effects of a script-fading procedure. *Journal of Applied Behavior Analysis*, 26(1), 121–132. <https://doi.org/10.1901/jaba.1993.26-121>

- Krasny, L., Williams, B. J., Provencal, S., & Ozonoff, S. (2003). Social skills interventions for the autism spectrum: essential ingredients and a model curriculum. *Child and Adolescent Psychiatric Clinics of North America*, 12(1), 107–122. [https://doi.org/10.1016/s1056-4993\(02\)00051-2](https://doi.org/10.1016/s1056-4993(02)00051-2)
- Kretzmann, M., Shih, W., & Kasari, C. (2015). Improving peer engagement of children with autism on the school playground: A randomized controlled trial. *Behavior Therapy*, 46(1), 20–28. <https://doi.org/10.1016/j.beth.2014.03.006>
- Ledford, J. R., Hall, E., Conder, E., & Lane, J. D. (2015). Research for young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, 35(4), 223–233. <https://doi.org/10.1177/0271121415585956>
- Ledford, J. R., & Wolery, M. (2013). Peer modeling of academic and social behaviors during small-group direct instruction. *Exceptional Children*, 79(4), 439–458. <https://doi.org/10.1177/001440291307900404>
- Lerna, A., Esposito, D., Conson, M., & Massagli, A. (2014). Long-term effects of PECS on social-communicative skills of children with autism spectrum disorders: a follow-up study. *International Journal of Language & Communication Disorders*, 49(4), 478–485. <https://doi.org/10.1111/1460-6984.12079>
- Litras, S., Moore, D. W., & Anderson, A. (2010). Using video self-modelled Social Stories to teach social skills to a young child with autism. *Autism Research and Treatment*, 2010, 1–9. <https://doi.org/10.1155/2010/834979>
- Maenner, M. J. (2023). Prevalence and characteristics of autism spectrum disorder among children aged 8 years — autism and developmental disabilities monitoring network, 11 Sites, United States, 2020. *MMWR. Surveillance Summaries*, 72(2). <https://doi.org/10.15585/mmwr.ss7202a1>
- Martin, A. J., & Dowson, M. (2009). Interpersonal relationships, motivation, engagement, and achievement: Yields for theory, current issues, and educational practice. *Review of Educational Research*, 79(1), 327–365. <https://doi.org/10.3102/0034654308325583>
- Martocchio, N., & Rosales, R. (2016). An evaluation of pyramidal training to teach implementation of the Picture Exchange Communication System. *Behavioral Interventions*, 31(3), 265–282. <https://doi.org/10.1002/bin.1448>
- Matos, D. C. de, Matos, P. G. S. de, Hora, A. F. L. T. da, Pereira, M. S., & Azevedo, K. S. (2019). Improvement of Conversation Skills through Script Fading in a Child with Autism Spectrum Disorder. *Creative Education*, 10(03), 485–504. <https://doi.org/10.4236/ce.2019.103035>
- Maynard, D. W., & Turowetz, J. (2013). Language use and social interaction. In J. DeLamater & A. Ward (Eds.), *Handbook of Social Psychology* (pp. 251–279). Springer.
- McClannahan, L. E., & Krantz, P. J. (2005). *Teaching conversation to children with autism: scripts and script fading*. Woodbine House.
- McCoy, A., & McNaughton, D. (2018). Training education professionals to use the Picture Exchange Communication System: a Review of the Literature. *Behavior Analysis in Practice*, 12(3), 667–676. <https://doi.org/10.1007/s40617-018-00296-4>
- Mohammed, A. A., & Mostafa, A. A. (2012). The effect of Social Stories intervention technique on self-management of eating behavior of a child with autism. *Psycho-Educational Research Reviews*, 1(1), 32–43.
- Morrier, M. J., Hess, K. L., & Heflin, L. J. (2010). Teacher training for implementation of teaching strategies for students with autism spectrum disorders. *Teacher Education and Special Education: The Journal of the Teacher Education Division of*

- the Council for Exceptional Children*, 34(2), 119–132. <https://doi.org/10.1177/0888406410376660>
- Müller, E., Cannon, L. R., Kornblum, C., Clark, J., & Powers, M. (2016). Description and preliminary evaluation of a curriculum for teaching conversational skills to children with high-functioning autism and other social cognition challenges. *Language, Speech, and Hearing Services in Schools*, 47(3), 191–208. https://doi.org/10.1044/2016_lshss-15-0042
- Murdock, J. (2020a). Autism: A function of neurodiversity? *Journal of Human Services: Training, Research, and Practice*, 5(1). <https://scholarworks.sfasu.edu/cgi/viewcontent.cgi?article=1077&context=jhstrp>
- Ogletree, B. T., Oren, T., & Fischer, M. A. (2007). Examining effective intervention practices for communication impairment in autism spectrum disorder. *Exceptionality*, 15(4), 233–247. <https://doi.org/10.1080/09362830701655782>
- Olçay-Gül, & Elif Tekin-Iftar. (2016). Family generated and delivered Social Story intervention: Acquisition, maintenance, and generalization of social skills in youths with ASD. *Education and Training in Autism and Developmental Disabilities*, 51(1), 67–78.
- Orsmond, G. I., Shattuck, P. T., Cooper, B. P., Sterzing, P. R., & Anderson, K. A. (2013). Social participation among young adults with an autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 43(11), 2710–2719. <https://doi.org/10.1007/s10803-013-1833-8>
- Pahnke, J., Lundgren, T., Hursti, T., & Hirvikoski, T. (2013). Outcomes of an acceptance and commitment therapy-based skills training group for students with high-functioning autism spectrum disorder: A quasi-experimental pilot study. *Autism*, 18(8), 953–964. <https://doi.org/10.1177/1362361313501091>
- Park, J. H., Alber-Morgan, S. R., & Cannella-Malone, H. (2010). Effects of mother-implemented Picture Exchange Communication System (PECS) training on independent communicative behaviors of young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, 31(1), 37–47. <https://doi.org/10.1177/0271121410393750>
- Parsons, M. B., Rollyson, J. H., & Reid, D. H. (2012). Evidence-based staff training: A guide for practitioners. *Behavior Analysis in Practice*, 5(2), 2–11. <https://doi.org/10.1007/bf03391819>
- Pasiali, V. (2004). The use of prescriptive therapeutic songs in a home-based environment to promote social skills acquisition by children with autism: Three case studies. *Music Therapy Perspectives*, 22(1), 11–20. <https://doi.org/10.1093/mtp/22.1.11>
- Paul, R., Orlovski, S. M., Marcinko, H. C., & Volkmar, F. (2008). Conversational behaviors in youth with high-functioning ASD and Asperger syndrome. *Journal of Autism and Developmental Disorders*, 39(1), 115–125. <https://doi.org/10.1007/s10803-008-0607-1>
- Pence, S. T., St. Peter, C. C., & Giles, A. F. (2013). Teacher acquisition of functional analysis methods using pyramidal training. *Journal of Behavioral Education*, 23(1), 132–149. <https://doi.org/10.1007/s10864-013-9182-4>
- Pervin, M., Ahmed, H. U., & Hagmayer, Y. (2022). Effectiveness of interventions for children and adolescents with autism spectrum disorder in high-income vs. lower-middle-income countries: An overview of systematic reviews and research papers from LMIC. *Frontiers in Psychiatry*, 13. <https://doi.org/10.3389/fpsy.2022.834783>

- Picardi, A., Gigantesco, A., Tarolla, E., Stoppioni, V., Cerbo, R., Cremonese, M., Alessandri, G., Lega, I., & Nardocci, F. (2018). Parental burden and its correlates in families of children with autism spectrum disorder: A multicentre study with two comparison groups. *Clinical Practice & Epidemiology in Mental Health*, *14*(1), 143–176. <https://doi.org/10.2174/1745017901814010143>
- Reichow, B., & Sabornie, E. J. (2009). Brief report: Increasing verbal greeting initiations for a student with autism via a Social Story™ intervention. *Journal of Autism and Developmental Disorders*, *39*(12), 1740–1743. <https://doi.org/10.1007/s10803-009-0814-4>
- Reichow, B., & Volkmar, F. R. (2010). Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders*, *40*(2), 149–166. <https://doi.org/10.1007/s10803-009-0842-0>
- Robinson, J., Milroy, G., & Shankland, M. C. (2016). Autism training matters: Optimising outcomes within Scotland. *DCP-S Review*, *1*(14), 40–44. <https://doi.org/10.53841/bpsdcps.2016.1.14.40>
- Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2007). Peer interactions, relationships, and groups. *Handbook of Child Psychology*, *3*, 571–645. <https://doi.org/10.1002/9780470147658.chpsy0310>
- Safi, M., Opoku, M. P., Alshamsi, M., & Abu-shariha, A. H. (2022). Comparative study of the perspectives on the impact of a culturally responsive Picture Exchange Communication System for children with autism spectrum disorder in the United Arab Emirates. *Frontiers in Pediatrics*, *10*. <https://doi.org/10.3389/fped.2022.841064>
- Sansosti, F. J., & Powell-Smith, K. A. (2008). Using computer-presented Social Stories and video models to increase the social communication skills of children with high-functioning autism spectrum disorders. *Journal of Positive Behavior Interventions*, *10*(3), 162–178. <https://doi.org/10.1177/1098300708316259>
- Senouci, M. (2021). Autism spectrum as a communication disorder: A case study. *African Educational Research Journal*, *9*(3), 687–695. <https://doi.org/10.30918/aerj.93.21.104>
- Smith, L. E., Maenner, M. J., & Seltzer, M. M. (2012). Developmental trajectories in adolescents and adults with autism: The case of daily living skills. *Journal of the American Academy of Child & Adolescent Psychiatry*, *51*(6), 622–631. <https://doi.org/10.1016/j.jaac.2012.03.001>
- Sparrow, S. S., & Cicchetti, D. V. (1985). Diagnostic uses of the Vineland adaptive behavior scales. *Journal of Pediatric Psychology*, *10*(2), 215–225. <https://doi.org/10.1093/jpepsy/10.2.215>
- Syriopoulou-Delli, C. K., & Eleni, G. (2021). Effectiveness of different types of augmentative and alternative communication (AAC) in improving communication skills and in enhancing the vocabulary of children with ASD: A review. *Review Journal of Autism and Developmental Disorders*, *9*. <https://doi.org/10.1007/s40489-021-00269-4>
- Tedoff, M. A. (2009). *Effects of script fading on the abilities of children with autism to reciprocate information* (pp. 1–152) [Theses, Dissertations, Professional Papers, and Capstones. 1184.]. <http://dx.doi.org/10.34917/2596914>
- Thiemann, K. S., & Goldstein, H. (2001). Social Stories, written text cues, and video feedback: effects on social communication of children with autism. *Journal of Applied Behavior Analysis*, *34*(4), 425–446. <https://doi.org/10.1901/jaba.2001.34-425>

- Thompson, R. M., & Johnston, S. (2013). Use of Social Stories to improve self-regulation in children with autism spectrum disorders. *Physical & Occupational Therapy in Pediatrics*, 33(3), 271–284. <https://doi.org/10.3109/01942638.2013.768322>
- Tincani, M., & Devis, K. (2010). Quantitative synthesis and component analysis of single-participant studies on the Picture Exchange Communication System. *Remedial and Special Education*, 32(6), 458–470. <https://doi.org/10.1177/0741932510362494>
- Trembath, D., Vivanti, G., Iacono, T., & Dissanayake, C. (2015). Accurate or assumed: Visual learning in children with ASD. *Journal of Autism and Developmental Disorders*, 45(10), 3276–3287. <https://doi.org/10.1007/s10803-015-2488-4>
- van de Rijt, A., Kang, S. M., Restivo, M., & Patil, A. (2014). Field experiments of success-breeds-success dynamics. *Proceedings of the National Academy of Sciences*, 111(19), 6934–6939. <https://doi.org/10.1073/pnas.1316836111>
- van der Wilt, F., van der Veen, C., van Kruistum, C., & van Oers, B. (2019). Why do children become rejected by their peers? A review of studies into the relationship between oral communicative competence and sociometric status in childhood. *Educational Psychology Review*, 31(3), 699–724. <https://doi.org/10.1007/s10648-019-09479-z>
- van Loon, A. W. G., Creemers, H. E., Vogelaar, S., Saab, N., Miers, A. C., Westenberg, P. M., & Asscher, J. J. (2019). The effectiveness of school-based skills-training programs promoting mental health in adolescents: a study protocol for a randomized controlled study. *BMC Public Health*, 19(1). <https://doi.org/10.1186/s12889-019-6999-3>
- Wang, M.-T., & Eccles, J. S. (2012). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development*, 83(3), 877–895. <https://doi.org/10.1111/j.1467-8624.2012.01745.x>
- Watkins, L., O'Reilly, M., Kuhn, M., Gevarter, C., Lancioni, G. E., Sigafoos, J., & Lang, R. (2015). A review of peer-mediated social interaction interventions for students with autism in inclusive settings. *Journal of Autism and Developmental Disorders*, 45(4), 1070–1083. <https://doi.org/10.1007/s10803-014-2264-x>
- Wright, L. A., & McCathren, R. B. (2012). Utilizing Social Stories to increase prosocial behavior and reduce problem behavior in young children with autism. *Child Development Research*, 2012, 1–13. <https://doi.org/10.1155/2012/357291>
- Zink, A. G., Molina, E. C., Diniz, M. B., Santos, M. J., & Guare, R. (2018). Communication application for use during the first dental visit for children and adolescents with autism spectrum disorders. *Pediatric Dentistry*, 40(1), 18–22.

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