

**Strategies for Encouraging Positive Social Engagements in Physical Education for Children
with High-Functioning Autism and Asperger's Syndrome**

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Abstract

This synthesis reviews the literature on strategies for encouraging positive social engagement in physical education for children with high-functioning autism and Asperger's syndrome. The types of interventions looked at in this synthesis included the use of task analysis, social stories, video modeling and other interventions that have been used to help with the development of the social skills necessary to be successful in their environment. The results showed that these interventions have a positive effect on increasing positive social engagement among children with high-functioning Autism and Asperger's syndrome. It is concluded that the interventions examined implemented in a physical education setting to help increase positive social engagement.

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Chapter 1: Introduction

Autism is a group of different developmental brain disorders that together are referred to as autism spectrum disorder (ASD), and includes a wide range of symptoms, skills, and levels of impairment (National Institute for Mental Health, 2017). According to the Center for Disease Control (CDC), the different developmental disabilities a child with autism can portray include significant social, communication, and behavioral challenges. People with ASD share similar symptoms, such as difficulty with social interactions, however the severity and exact nature of the symptoms ranges from very mild to severe (CDC, 2018). In addition, many individuals with ASD are believed to process information to their brain differently which causes them to develop different ways of learning, paying attention, or reactions to different stimuli (CDC, 2018).

Asperger's Syndrome (AS) is the mildest form of ASD that falls along the spectrum, while being synonymous with the most highly functioning individuals within this group (National Institute of Health, 2018). Children with ASD display qualitative impairment in both communication and social interaction (Rodger, Pham & Mitchell, 2008). Difficulties include restricted, repetitive and stereotyped patterns of behavior, interests, and activities; impairment in social, occupational, or other important areas of functioning; as well as experience difficulties using higher-level social pragmatic language skills such as social relatedness and the use of language or communicative purposes (American Psychiatric Association, 2018).

Autism and Asperger's Syndrome share some common characteristics. These include deficits in verbal and nonverbal communication, a preference for interacting with objects over peers, deep immersion in one field of interest, strict adherences to routines, and repetitive motions (American Psychiatric Association, 2004). While the prevalence of ASD is unclear, experts estimate that as many as 1 in 88 children will have an autism spectrum disorder (Center

for Disease Control and Prevention). This statistic has increased 23% since 2009, and 78% since 2007.

Rodger, Pham and Mitchell (2009) state that there is no specific treatment for Asperger's Syndrome and interventions vary depending on the child. Multiple psychological interventions are used today including individual psychotherapy to assist with the emotional impact of social interaction challenges, parent education to assist parents in meeting the needs of their children, behavioral modification training also known as Applied Behavioral Analysis (ABA), social skill training and educational interventions (Rodger Pham, and Mitchell, 2006; Sofronoff, Leslie & Brown, 2004). Positive Behavioral Supports (PBS) are a set of research-based strategies used to increase quality of life and decrease problem behavior by teaching new skills and making changes in a person's environment. (Association of Positive Behavior Support, 2014). PBS interventions are designed both to reduce problem behaviors and increase socially appropriate behaviors. These outcomes are achieved through teaching new skills and changing environments that might trigger problem behavior. A goal of positive behavioral supports is to help ensure that children that are at risk for being looked at as below average are helped to achieve valued roles of society, which in turn will increase their likelihood that they will be respected. Research shows that interventions are an essential part to building social competence in school-aged children and teens with high functioning autism and Asperger's Syndrome. Developing the necessary skills to engage in social situations will increase quality of life.

Statement of the Problem

Many children and adults with high-functioning autism or Asperger's Syndrome struggle with social acceptance and need help in learning how to act in different types of social situations. They often have the desire to interact with others but may not know how to engage friends or may be overwhelmed by the idea of new experiences. By applying effective instructional

strategies to promote social engagements for individuals with high-functioning autism and Asperger's Syndrome the necessary skills needed to develop social competency are being taught and practiced. Developing social competency prepares for a lifetime of healthier interactions in all aspects of life. A review of the research provides valuable information on this topic and will promote effective instructional strategies that can be used to improve social engagements for individuals with high functioning autism and Asperger's Syndrome.

Purpose of the Synthesis

The purpose of this synthesis is to review strategies for encouraging positive social engagement in physical education for children with high-functioning autism and Asperger's Syndrome. The focus will be on what positive behavioral supports can best be used within a physical education setting. Ultimately, the results from this research paper will better inform teachers as to what interventions they can incorporate into their classroom in order to create a positive learning environment for all students.

Research Questions

The following presents research questions that will be addressed in this synthesis:

1. What are the positive behavioral supports found in the current literature to improve social communication of school-aged children with high-functioning autism and Asperger's Syndrome?
2. What experimental evidence exists to support the use of different positive behavioral supports to improve the social communication of school-aged children with high-functioning autism and Asperger's Syndrome?
3. What are the unique factors that mediate successful physical education participation for children with high-functioning autism and Asperger's Syndrome?

Delimitations:

1. Population being studied are individuals with high-functioning autism and Asperger's Syndrome.
 - Participants are both male and female between ages 9-14.
 - Articles used in the literature review were peer reviewed.
 - Articles used in the literature review were delimited to types of positive behavioral supports and interventions strategies targeted to improve social interactions in children with high-functioning autism and Asperger's syndrome.

Operational Definitions

High-Functioning Autism: Individuals with autism spectrum disorder who read, write, speak, and manage life skills without much assistance.

Asperger's Syndrome: A developmental disorder related to autism and characterized by higher than average intellectual ability paired with impaired social skills and restrictive, repetitive patterns of interest and activities. (The National Autistic Society, 2016).

Challenging Behaviors: Behaviors such as emotional sensitivity, self-injury, fixation on subjects or ideas, social difficulties, problems processing physical sensations and the eating of inappropriate objects (Applied Behavior Analysis, 2017).

Positive Behavioral Supports: A set of research-based strategies used to increase quality of life and decrease problem *behavior* by teaching new skills and making changes in a person's environment (Association of Positive Behavior Support, 2014).

Social Stories: Written short stories that provide the child accurate social information about an activity of event, a description of the possible reactions of others, and direction as to the responses he or she is expected to provide in a specific type of social situation (Gray, 2000; Scattone, 2007).

Chapter 2: Methods

The purpose of this chapter is to provide details of the literary search, a process used to gather all relevant data on positive behavior interventions in relation to children with high-functioning autism and Asperger's Syndrome. This section will include information on what databases were searched, keywords that were used, and articles that were chosen.

Studies that utilized positive behavior supports interventions that generalized physical education were targeted. Initial criteria for the selection and rejection of articles included how relevant they were to the topic, as well as the timeframe in which they were published. Since information on high-functioning autism and Asperger's Syndrome continues to develop articles were chosen that had been published in the year 2000 or later.

All research was conducted using an online database available at the library at the College at Brockport. The main database was Academic Search Complete. This database has over 8,750 full-text periodicals in which more than 7,800 of them were peer-reviewed. SPORTDiscus was also used through the EBSCO Host.

When searching in Academic Search Complete, the first key words searched were *autism, and behavior*. These key words received 6,337 hits and one article was chosen: *Differences in challenging behaviors between children with high functioning autism and Asperger's disorder*. The next set of key words were *Autism and positive behavior support*, which received 113 hits and zero articles were chosen. Next, key words searched were *social engagement and autism* with 16 results and zero articles were chosen. The next key words chosen were *Asperger's syndrome, and autism*. This got 2,109 hits with 4 articles being chosen: *Asperger's syndrome and high-functioning autism: Language, motor and cognitive profile; Differentiation of high-functioning autism and Asperger's disorder based on neuromotor behavior; Using problem-solving frameworks to address challenging behavior of students with high-functioning autism*

and/or Asperger's Syndrome; and Social skills interventions for children with Asperger's Syndrome or high-functioning autism: A review and recommendations.

The next keywords used while still searching within Academic Search Complete were *Asperger's AND Syndrome, Autism, and Social Interaction*. This resulted in 171 hits, with 6 articles being chosen: *Predicting friendship quality in autism spectrum disorders and typical development; A comparison of video feedback and in vivo self-monitoring on the social interactions of an adolescent with Asperger's syndrome; Brief Report: Individual social-multimodal intervention for HFASD; Brief Report: Group social-multimodal intervention for HFASD; The impact of social-behavioral learning strategy training on the interaction skills of four students with Asperger's Syndrome; Enhancing the conversation of skills of a boy with Asperger's disorder through social stories and video modeling.*

The ancestry method was used throughout this process after reviewing articles that were connected to the topic in order to determine unusable resources and find new articles. In all, twelve articles were chosen to build the critical mass of this synthesis project. Main topics of positive behavior interventions include task analysis, social stories, and video modeling, while using questionnaire interventions to see what triggers specific behaviors. The peer reviewed articles used were found in the following journals: *The Journal of Positive Behavior Interventions, Australian Occupational Therapy Journal, School Psychology Review, Focus on Autism and Other Developmental Disabilities, The Journal of Autism Developmental Disorder, and The Journal of Behavioral Education.*

Chapter 3: Review of Literature

The purpose of this chapter is to review the literature on strategies for encouraging positive social engagement in physical education for children with high-functioning autism and Asperger's Syndrome. Specifically, physical education instructional strategies such as task analysis, social stories and video modeling will be reviewed.

Instructional Strategies

There are a variety of instructional strategies that can be used to assist students with ASD access and engage in motor skills. Each of these will be fully explained below.

Task Analysis

One instructional strategy, task analysis, has been used extensively with teaching students with disabilities in physical education. Task analysis is the systematic break down of skills into their component parts (Alberto & Troutman, 2003). Cameron, Shapiro, and Ainsleigh (2005) investigated how positive behavioral supports can be used to teach an educational activity. The task of interest was bicycle riding and included a case study of a 9-year old fourth grader with Asperger's Syndrome. After a baseline assessment was conducted, an eight-step task analysis was designed to teach him how to ride a bike, as well as show how it could be effectively implemented and evaluated against social values. For every minute spent that the subject was riding his bicycle, his parents would match a minute of access to his Game Cube as a positive reinforcer. Results demonstrated that the program was successfully completed within 64 sessions across a 105-day span, with the participant needing to be only corrected five time (Cameron, Shapiro, & Ainsleigh, 2005). At the end of the intervention, the participant was able to ride his bicycle for .4 km on three occasions without falling. Following the participant's ability to demonstrate successful bicycle riding, the use of the Game Cube as a positive reinforcer was removed, and natural reinforcers such as being able to ride to friend's house were incorporated

because they are more likely to be maintained and generalized (Cameron, Shapiro, & Ainsleigh, 2005)

Another type of task analysis which explored the global and domain-specific strategies and types of guidance utilized to improve task performance was conducted by Rodger, Pham and Mitchell (2009). This cognitive approach created through a structured problem-solving process is known as Cognitive Orientation for Occupational Performance (CO-OP). CO-OP's problem-solving framework is used for the basis of the intervention, involving four phases: stating a goal, developing a plan, executing the plan, and judging its success. For this study, two children with Asperger's Syndrome participated, the individuals were 9 and 11. Both participants were involved in 10 weekly individual one-hour sessions that involved enhancing skill acquisition for each of the three child-chosen goals. Goals for participant one was to use a knife and fork effectively, brush and style their hair, and tie her shoelaces. Goals for participant two was to remember his gymnastic routine, write neater and faster, and use a knife and fork efficiently.

Each session was videotaped, two five-minute sessions were randomly chosen, digitized and coded onscreen using the Observer Software Package. The Observer Software Package is a professional manual event recorder for the collection, management, analysis and presentation of observational data (Rodger, Pham, and Mitchell, 2009). The mean percentage across all sessions and reliability analysis were 94.06% for participant one, and 89.30% for participant two, which are excellent (Rodger, Phan, and Mitchell, 2009). This study showed that both participants were able to use the CO-OP strategy to enhance their skill performance and goals.

Social Stories

Social stories were developed by Gray (1994) to help individuals with autism spectrum disorder interpret and act on specific social situations. They consist of an introduction, body, and conclusion, while including descriptive, perspective, affirmative and directive sentence types to

increase the understanding of social situations, while enabling one to demonstrate appropriate behaviors, reactions, and responses (Hanley-Hochdorfer, Bray, Kehle, & Elinoff, 2010).

Hanley-Hochdorfer, et al., (2010) investigated the effect that social stories have on increasing verbal initiation in children with ASD. The study included four students; three males that were 6, 11, and 12-years old that have been diagnosed with Asperger's Syndrome, and a 9-year old female with Autism. Research was conducted within a school setting to determine the effect of social stories on verbal initiation and contingent responses to peers. Social stories were developed for the participants in accord with Gray's (2000) and Gray and Garand's (1993) guidelines, using Gray's Social Story Checklist to assist with the development process.

Structured behavioral observations were conducted during lunch by trained observers. A frequency count procedure was used to record the number of times specific target behaviors occurred during a 15-minute period. The first target behavior was a verbal initiation, which looked at the initiation of comments and requests and were coded if after a 3-second interval the target child requests information, objects, or actions and were coded if after a 3-second interval the target child makes a comment about an ongoing topic or activity (Delano & Snell, 2006). The second behavior that was observed was contingent responses that were coded when the target child responds (verbally or nonverbally) to a peer's utterance within a 3-second interval (Delano & Snell, 2006). For consumer satisfaction, the 20 item Intervention Rating Profile was administered upon completion of treatment to special education teachers and readers.

Results of the study revealed that the percentage of nonoverlapping data for verbal initiations ranged from 1-38%, and from 11-36% for contingent responses (Hanley-Hochdorfer, et al., 2010). This suggests that the intervention may be unreliable. However, results from the consumer satisfaction Intervention Rating Profile had an average rating of 5.18, showing that the

intervention was acceptable and socially valid according to the teachers (Hanley-Hochdorfer, et al., 2010).

Sansosti and Powell-Smith (2006) looked at the effectiveness of social stories designed to increase target behaviors. This study looked at three elementary-aged males, ages 9-11, who were diagnosed with Asperger's Syndrome, displayed above average cognitive functioning, had the ability to communicate orally, and demonstrated basic reading skills necessary to read the social story. The study took place in a setting that was related to the identified behaviors targeted, where participants were observed for 15-minute periods three times a week. Individual social stories were created for each participant and made into a print book that the student could carry to and from school to use in multiple settings. Caregivers of the participants were instructed to have their children read and review their social story two times a day (before and after school). Along with the story, a social story was assessed by measuring the percentage of social engagement during observations. Sportsmanship, maintaining a conversation, and joining in were some of the measures that were being studied. According to the baseline design, results show that increases in social engagement developed for two out of the three participants. Participant one's mean percentage of sportsmanship increased by 32%, participant two's mean score for maintaining a conversation increased by 29%, and participant three's percentage score for joining in was 9%. Following the intervention all three participants continued to increase their percentage of understanding to 25%, 23%, and 67% (Sansosti & Powell-Smith, 2006). In this study, social story interventions were shown to be effective in increasing specific social engagement detail for two out of the three children.

In a study examining the effect of a social-behavioral learning strategy intervention, Bock (2007) looked at how the intervention affected the social interaction skills of four male elementary-aged children with Asperger's Syndrome. The intervention focused on implementing

a social-behavioral learning strategy known as SODA which provided rules for acknowledging social cues, how to process these cues, and how to select specific social skills they will use within a specific activity. The phrase SODA stands for “stop” (S), “observe” (O), “deliberate” (D), and “act” (A). SODA stories were individually written for each participant in the study. They were written in the first person and described the specific social-behavior difficulties the participants presented. The intervention took place immediately before the specific activity the story was written for which were social studies, recess or lunch.

Bock (2007) demonstrated that during baseline testing, the mean score of all four subjects participating in cooperative learning activities, organized sports, and visiting with peer was at or below 23%. Subject one showed a gain of 58% for cooperative play from baseline to SODA intervention, 67% for recess games and 44% during lunch conditions. Subject two's score for maintaining a conversation increased 29% after the SODA intervention and participant three's percentage score for joining in activities increased by 9%.

Bock (2007) revealed that SODA had positive benefits on time spent participating in cooperative learning activities, playing organized sports during recess, and visiting with peers during lunch compared to before the intervention was implemented. After the training was discontinued, performance levels were still maintained while demonstrating long-term memory of the skills they had learning (Bock, 2007).

Video Modeling

In order to enhance conversation skills for children with autism, video modeling has been found to be an effective tool (Scattone, 2007). It involves viewing videos in which a peer or adult models desirable behaviors, making sure that inappropriate and undesirable behaviors are omitted (Clare et al., 2000).

Researchers have examined the effect of combining social stories and video modeling (Scattone, 2007). A nine-year old boy with Asperger's Syndrome was observed to determine the impact of social stories combined with video modeling on the conversation skills of the participant. The study took place at a medical center for 24 sessions over a 15-week period. After the social story was narrated, the target skill was modeling during a 5-minute video taped conversation. Upon completion of the video, the participant's comprehension was assessed by completing predetermined questions (qualitative). Prior to the intervention, baseline data was recorded by observing the participant's occurrence of eye contact, smiling and initiations.

Scattone (2007) found that the mean level of eye contact increased from 6% to 97%, smiling increased from a mean of .6% to 7%, and initiations increased from a mean of .8% to 33% from the baseline to after the intervention (Scattone, 2007). Intervention effectiveness was assessed through computing nonoverlapping data (PND) for appropriate social interactions. The participants PND for eye contact was 100%, smiling was 32%, and interactions was 100%. These results suggest that PND for eye contact and interactions were highly effective, however smiling was ineffective. Social stories combined with video modeling were effective in increasing the conversation skills of a boy for two out of three target behaviors.

State and Kern (2011) investigated the effectiveness of video feedback and in vivo self-monitoring on inappropriate and appropriate social interactions. The participant was a 14-year old male that was diagnosed with Asperger's Syndrome and had social difficulties. Direct observations of the participant were videotaped and collected on his inappropriate social interactions, inappropriate noises, and appropriate social exchanges. The videotapes were later coded for 15-second intervals to determine whether or not they engaged in the target behaviors.

After a 15-minute initial instructional session, the participant was shown the videotape and determined if his interactions prior to the tape were appropriate or not. During the video

feedback phase, behaviors were reviewed from the activity session on the previous day, and the participant would label whether his interactions were appropriate or inappropriate.

Results show that during the baseline phase of the study, the participant was at a mean of 24% for inappropriate interaction, and then decreased to 20%, before decreasing more to 10% with the introduction of in vivo self-monitoring. Inappropriate noises began at 37%, lowered slightly to 36%, and dropped even greater to 10% with self-monitoring (State & Kern, 2011). The video feedback intervention resulted in a minor reduction in inappropriate interactions and noises (State & Kern, 2011).

Combined Approach

Locomotor movements are gross motor skills in which the goal of the movement is body transport, including skills such as walking, running, jumping and galloping. These skills are taught beginning at a young age in physical education and are worked on and incorporated to many activities throughout their education. Nayate et al. (2011) looked at the differentiation of high-functioning students with Autism and Asperger's Syndrome based on their neuromotor behavior. Eleven children with high-functioning autism and eleven children with Asperger's Syndrome, ages 7-18, were recruited through specialized assessment. The purpose of the study was to investigate gait control by manipulating walking speed, the effects of curing strategies on gait improvement, and to investigate high-level information processing by utilizing a dual-task gait paradigm. Gait was measured using the GAITRite system which consists of an electronic walkway that produces step-to-step values for all measures of gait in each walk; speed, cadence, stride length, heel base of support, and y-axis range. For each walking condition, participants completed three trials.

The first aim of the study was to look at the relationship between spatiotemporal measures under conditions of a self-determined walking speed; preferred, faster than preferred,

and slower than preferred. Results showed that significant differences were found for in all three conditions for base of support; preferred ($p=.009$), fast ($p=.014$), and slow ($p=.038$) walking. Children with Asperger's Syndrome were found to be significantly more variable than the control group ($p=.018$) as well as the high-function autism group ($p=.034$) (Nayate, Tonge, Bradshaw, McGinley, Ianse, & Rinehart, 2011).

The second aim of the study was to examine the effects of adding visual cueing on improving gait. Participants were asked to walk around two conditions; with markers placed at equal intervals along the gait mat, and with them removed. Significant differences were found for stride length variability ($p=.026$) and base of support variability ($p=.008$) under non-cued conditions. Post hoc tests showed that the autism groups showed a variable stride length compared to the control group ($p=.021$) and the Asperger's group had a more variable base of support when compared to the control group ($p=.024$), revealing no significant differences between the autism and Asperger's group (Nayate, Tonge, Bradshaw, McGinley, Ianse, & Rinehart, 2011).

The last part of the study focused on examining gait under dual-task conditions by walking under two conditions; preferred walking while counting and preferred walking while completing a serial counting task (tapping). Results show that both the counting group ($p=.024$) and the tapping group ($p=.001$) revealed statistical significance. Children with Asperger's did display increased variable direction of progression when compared with the other groups during dual-task conditions.

Engagement/Data Collection Assessments

Assessment is an important part of determining if interventions are affective in impacting social engagement. Cognitive-behavioral-ecological (CB-E) social skills training for children with high functioning autism, Bauminger (2006) looked at the efficacy of an individual CB-E

intervention in facilitating children's social interactions and cognitive capabilities. Participates included 19 children ranging from 7-11 years old. Different tests were used to measure three different areas; social behavior, social cognition and emotional/self-perception.

For social behavior, the Social Interaction Observational Scale (Bauminger, 2002) looked at changes in an individual's social interaction capability through observation. The observation categories are broken up into positive, low-level, and negative social interaction behaviors. For positive, children were more likely to initiate and respond positively to peers at the post-test interval than during the pre-test. For low-level social interactions children were less likely to initiate and respond to peers after treatment. Lastly, for the negative category, there was no significant statistics for there were very few interactions before and after treatment. A 30-item Social Skills Rating Scale (Gresh & Elliot, 1990) is a teacher-rated scale that measures children's change in overall social skill capabilities. After running a follow-up ANOVA, significant improvement was demonstrated from pre-test to post-test on all three areas of social skills.

For social cognition, the Problem-Solving Measure (Lochman & Lampron, 1986) was used to assess a child's skills through nine hypothetical social problems. When being compared to pre-test scores, children during post-test provided fewer non-social solutions, more social solutions, and a tendency to also provide more help-seeking solutions. Another way social and emotional understanding was looked at was through the Emotion Inventory (Seidner, Stipek, & Feshbach, 1988) which measured a child's ability to provide examples of emotions; basic, complex, and overall. Follow-up ANOVA's determined an improvement in the ability to explain emotions after treatment, while showing significant progress in the ability to display examples of complex emotions.

Overall, results showed that children improved their positive social behaviors immediately after treatment low-level behaviors decreased significantly suggesting that social

skill training that incorporates CBT may potentially lessen social cognition deficits, and that changes in perceived self-concept did not emerge.

When it comes to understanding positive behavioral supports that influence social engagement, one needs to look at a person's intellectual functioning and language abilities. In a study conducted by Bauminger, Solomon, and Rogers (2009), the role played by social relationship variables was examined in both observed friendship behaviors and in children's descriptions of friendships in children with high-functioning autism and typically developing peers. One hundred and sixty-four children from the United States and Israel participated in this study, including 44 children with high-functioning autism, 38 age-matched typically developing peers, and 82 friends' children nominated.

Two scales were used to measure attachment and mother-child relationships, two scales to measure friendship, and one scale to assess theory of mind. The Kerns Security Scale (Kerns et al., 1996) measures a child's perception of security in mother-child relationships through a 15-item, self-reported 4-point scale. The inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) was developed to measure a child's perception of the positive and negative cognitive/affective dimensions of relationships with their parents through a 25-item, 5-point Likert scale. Children's perception of friendship quality was assessed through a 23-item Friendship Qualities Scale (Bukowski et al., 1994). The 55-item Dyadic Relationships Q-Set (Park & Waters, 1989) was utilized to evaluate dyadic behavioral dimensions as coded in videotapes of two observed experimental friendship scenarios; drawing and a construction game. The last assessment used that determined theory of mind was the Perner and Wimmer (1985) "ice-cream van story" that was implemented to assess second-order false-belief attribution, which required a child to predict the thoughts of one person based on the thoughts of another.

Results show that the high-functioning autism group did not differ from their typically developing peers when looking at attachment security. Also, typically developing children perceived their relationships with their mothers to be more open to communication and more trustful when being compared to individuals with high-functioning autism. Findings show that 54.5% of children with high-functioning autism perceived themselves as securely attached to their mother. Higher verbal capabilities appeared most important when looking at observed friendship qualities associated with coordinated play and responsiveness. The study measured support that developmental and relationship characteristics had stronger effects on observed behavior between friends. When looking at coordinated play, a higher theory of mind skill set and a higher sense of attachment security enhances a child's ability to coordinate play with friends as well as enhance children's sense of closeness with friends.

Summary

As a result of this synthesis, positive behavioral interventions show to have a positive effect on increasing social interaction and engagement for children with high-functioning autism and Asperger's Syndrome. Physical education is a great place to teach individuals the social skills necessary to be a productive member of society. The interventions that were looked at can easily be implemented within a physical education setting to help increase and ensure positive social interactions among all students. Learning to interact and work with peers and other individuals is something that is needed to ensure success throughout a person's life and should be infused starting at a young age.

Chapter 4: Discussions and Future Research Recommendations

The effect of strategies for encouraging positive social engagement in physical education for children with High-Functioning Autism and Asperger's was reviewed in this synthesis. Specifically, physical education instructional strategies such as task analysis, social stories and video modeling and combined interventions were present. Based on the review various conclusions were discovered.

SHAPE America standards for physical education are to develop physically educated individuals who have the knowledge, skills and confidence to enjoy a lifetime of healthful physical activity (SHAPE America, 2017). One element necessary to help meet this goal is for children to show the ability to interact in a positive manner with peers and teachers. Findings from studies such as Sansosti and Powell-Smith (2006) and Scattone (2007) show that positive behavior interventions such as social stories and video modeling increase preferred behaviors in children with high-functioning autism and Asperger's syndrome. This in turn can help ensure that students, as well as as their peers have a successful physical education experience.

Positive behavioral supports have been used as teaching tools in education settings, while emphasizing the implementation of practical strategies to minimize errors during instruction and maximize positive outcomes (Cameron, Shapiro, & Ainsleigh, 2005).

Task analysis is the first type of intervention that was shown to be effective. In the study conducted by Cameron, Shapiro, and Ainsleigh (2005), the task analysis used was based on six key elements: involve individual in design, consider all values, consider the skills of the implementers, secure approval, consider the resources and support necessary and provide the support needed to sustain the use of effective strategies (Cameron, Shapiro, & Ainsleigh, 2005). Many of these elements are used to create different task analysis daily within a physical education setting.

Social Story interventions were shown to be effective because they demonstrated the potential benefits with teaching new social behaviors, in comparison with their peers; while contributing to the development of evidence-based approaches for student support personnel (Sansosti & Powell-Smith, 2006). Not only are the skills and game play taught within a physical education setting, but also life skills such as cooperation, team building, and sportsmanship. Utilizing social stories is an easy way to help teach individuals how to appropriately behave within their environment.

Video modeling has been found to also be effective in enhancing conversational abilities for children with autism by utilizing visual cues to teach appropriate social skills (Scattone, 2007). The use of video modeling is already used within physical education. While the type of video modeling focuses more on the physical skill sets like in a game-like activity, appropriate social interactions can also be easily implemented and displayed within the same context. This is an easy way to teach all students how to successfully conduct multiple skill sets while teaching all three domains.

In physical education, skills are broken down into two-different categories: manipulative which involves object control skills, and locomotor which involves body movement skills. Locomotor movements are necessary skills and serve as building blocks to all other movements. Students with high-functioning autism and Asperger's have a clear distinct gait pattern, whereby they may appear awkward. In addition, gait performance declines with the inclusion of added cognitive demands. This information shows that individuals with high-functioning autism and Asperger's syndrome may have a more difficult time within physical education setting if their locomotor skills aren't fully developed. Incorporating strategies to improve these skills into more activities, especially at a young age, can help to improve both their performance within the class,

as well as their confidence. This can be done easily by adding them to warm-up games and lead-up activities and can even be demonstrated through video modeling.

The last type of positive behavior supports that were found to be effective was the use of engagement and data collection resources. The resources discussed can be used within the classroom to determine cooperation, social engagement, and the self-perception of any student. Providing students with high functioning autism and Asperger's Syndrome opportunities to participate in cooperation activities while providing positive feedback during physical education will increase their overall success.

Recommendations

Recommendations for future research related to strategies for encouraging positive social engagement in physical education for children with high-functioning autism and Asperger's syndrome are advised. There are few limitations to this synthesis project. Some of the studies only include a few sample subjects, sometimes involving only a single case study on one individual (Rodger, Pham, & Mitchell, 2009). This makes it difficult to generalize the results produced. When conducting future research, it is crucial to develop a larger sample size when collecting data to ensure external validity of the results. Another limitation involves the consistency of where/when the stories were read. For example, in the study conducted by Sansosti and Powell-Smith (2006), social stories were read at home with a parent. This made it difficult to identify the manner in which the story was read, or if the context of the reading had any impact on the effectiveness of the intervention.

After looking at the findings, there are some recommendations that can come from this research. Creating more opportunities for children with high-functioning autism and Asperger's Syndrome to positively engage with their peers would be the main recommendation. This can be done a few different ways. First, provide a positive atmosphere where students feel comfortable

to be an individual, while learning the skills of how to work together as a team. Also, providing structure within the classroom can help reduce negative behavior and emotions, which in turn will help to ensure a positive environment. For example, having the schedule posted as the students enter the gymnasium, including pictures of the sports and activities that they will be participating in. Also, keeping classroom procedures consistent is another example.

Another way to increase positive social engagement is to infuse task analysis methods into daily use. This can be used to increase locomotor skills as well as positive behavior by breaking down the steps necessary to be successful. Not only should these be created, but also the students should be actively involved in the learning process. Also, an intervention that can easily be implemented daily would be to start off each class with a social story, especially at the elementary level. Children love to hear and learn from storytelling, so this is a great way to teach all children how to act appropriately without singling anyone out.

The last recommendations would be to increase positive social engagement through providing successful learning and engagement experiences for students with high-functioning autism and Asperger's syndrome. In physical education, providing students a variety of ways to learn can help do this. Avoid teaching by always using a command style approach that singles out students. Set up stations and infuse exploratory learning, which can help provide those students that need extra practice the chance to learn on their own. While keeping in mind that we are preparing our students to be successful not only in the classroom but throughout their lifetime, providing students with opportunities to learn and demonstrate how to properly behave in turn will help prepare them to display positive social interactions on command. First impressions mean a great deal to people, and for individuals with high-functioning autism and Asperger's, this can be a difficult situation. By teaching these children how to positively engage with other individuals and providing them with many opportunities to do so, the goal is to have

that child be prepared to act in the manner they have practiced at any one given moment successfully. This is displayed in Figure 1.

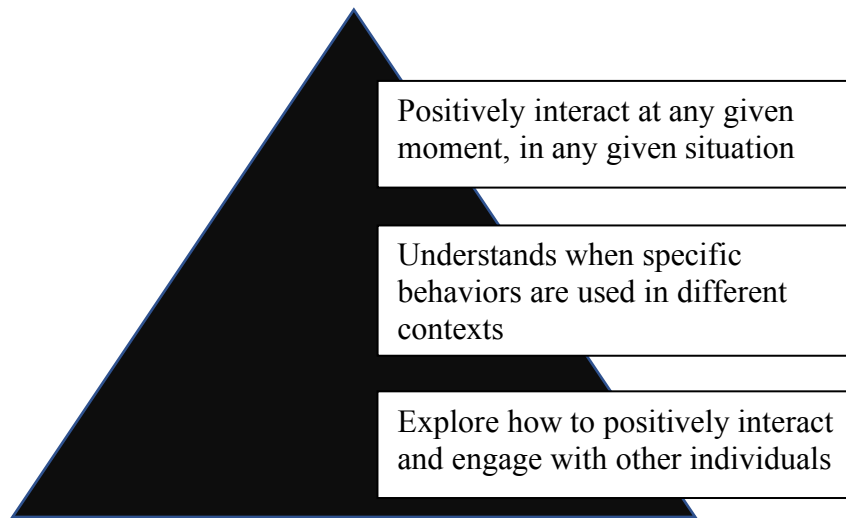


Figure 1: Hierarchy of Social Engagement.

Appendix A

Article Grid

Author	Title	Source	Purpose	Methods & Procedures	Analysis	Findings	Discussions/Recommendations
Baumer (2007)	Individual social-multi-modal intervention for HFASD	<i>Journal of Autism & Developmental Disorders</i>	Examined efficacy of an individual cognitive-behavioral-ecological (CB-E) intervention in facilitating children's interactions and their social cognitive capabilities	Intervention conducted in schools by main teacher, including a typically developing peer and parents IEP included work on SST curriculum. Curriculum included instruction in prerequisite social concepts, affective education, and social interpersonal problem solving.	Overt social behavior= social interaction measure, social skills rating scale. Social cognition= problem solving measure, emotional inventory. Emotional recognition= affective matching measure. Self-reports = self-perception profile	Demonstrated significant improvement from pre-test to post-test on all three areas of social skills.	HFASD were less likely to initiate and respond positively to peers at the post-test and using low-level behaviors to peers after treatment. HFASD initiate more than they responded. Children improve their positive social behaviors and decreased low-level behaviors. SST that incorporates CBT may potentially lessen social cognition deficits in HFASD.

					for children, loneliness rating scale		
Baumer, Solomon, & Rodgers (2010)	Predicting friendship quality in Autism spectrum disorders and typical development	<i>Journal of Autism & Developmental Disorders</i>	Investigate how attachment security theory of mind, and development affect the friendship of children with ASD	Used two scales to measure attachment and mother-child relationships, two scales to measure friendship, and one to measure theory of mind.	Kerns Security Scale (KSS)-child's perception of security Inventory of Parent and Peer Attachment (IPPA) - child's perception of positive and negative relationships with parents. Friendship Qualities Scale (FQS)-child's perception of	KSS-54.4% HFASD vs. 71% TD=secure classification 57% HFASD group passes the belief question vs 97.3% TD.	HFASD group did not differ on the measurement of attachment security. TD perceived their relationships with their mothers as more to communication and more trustful compared to HFASD. Children with theory of mind false-belief understanding perceived their relationships with their mothers as more trustful, open to communication and less detached. Developmental and relationship characteristics had the strongest effects on observed behavior between friends.

					<p>friendship quality</p> <p>Dyadic Relationship Q-Set (DRQ) - evaluated dyadic behavioral dimensions</p> <p>“Ice cream Van Story-Child predicts thoughts of one person based on another</p>		
Bock (2007)	The impact of social-behavioral learning strategy training on the social interaction skills of four students	Focus on Autism & Other Developmental Disabilities	The purpose of this study was to replicate and extend learning strategy research investigating the effects of social-	SODA story created for each student for social studies, recess and lunch. Stories were read before each activity and discussed with special education	Students were asked a series of questions to evaluate the social validity or overall usefulness of the	First: SS=58% improvement Recess=67.46% improvement Lunch=44.18% improvement Second: SS=52.58%	Increases in the percentages of time spent participating in cooperative learning activities during social studies, playing organized sport games, during noon recess, and visiting with peers during lunch after SODA training: maintained the

	with Asperger's syndrome		behavioral learning strategy training on the social interaction skills of adolescents with AS.	teacher. Data was recorded across all settings once a day. S=stop O=observe D=deliberate A=act	program.	improvement Recess=71.27% improvement Lunch=41.48% improvement Third: SS=47.67% improvement Recess=74.43% improvement Lunch=41.93% improvement Fourth: SS=55% improvement Recess=65.63% improvement Lunch=51.66% improvement	performance levels they attained during training, after. All participants demonstrated long-term memory of SODA program 1 month after maintenance.
Cameron, Shapiro, & Ainslie (2005)	Bike riding: Pedaling made possible through positive behavior	<i>Journal of Positive Behavior Interventions</i>	To demonstrate how a task analysis can be designed based	8-step task analysis program was individually developed after baseline.	85% reliability between the observers	Bike riding program was successfully completed	Encourage positive behavior support ideas to help children with AS develop an educational program.

	ral interventions		on knowledge of relevant variables of positive behavioral support and to show how a task analysis, designed to teach bike riding, could be effectively implemented and evaluated against social values.	Every minute on the bike equals 1 minute to play with the Game Cube which is a positive reinforcer Task Analysis Checklist for mastery Data collected on amount of time spent peddling		within 64 sessions conducted across 105 days, making only 5 errors with the use of an individualized task analysis.	
Henley-Hochdorfer, Bray, Kehle & Elinoff (2010)	Social stories to increase verbal initiation in children with Autism and Asperger's disorder	School Psychology Review	The purpose of this study was to investigate the use of social stories to increase the prosocial behaviors of verbal	Two different areas measured: target behaviors and consumer satisfaction.	Measured through observation and 20-item Intervention Rating Profile.	Percentage of nonoverlapping data ranged from 1.38%, and from 11.36% for contingent responses.	Results suggested that the efficaciousness of this intervention is questionable and in need of further research

			initiations and contingent responses.				
Nayate, Tonge, Bradshaw, McGinley, Iansek & Rinehart (2012)	Differentiation of high-functioning Autism and Asperger's disorder based on neuromotor behavior.	<i>Journal of Autism & Developmental Disorders</i>	To explore the neural mechanisms that underlie gait disturbances in children with autism and AD, specifically whether the movement disturbances are qualitatively distinct or appear to be of similar pathogenesis, and the implications of this in light of the neurobiological distinction between	Participants completed three trials of each walking condition. (1) self-determined walking speed; preferred fast, and slow (2) cueing; visually and non, & (3) concurrent task; preferred walk and counting & preferred walk and tapping	GAIT Rite-produced step-to-step values for all measures of gait in each walk; speed, cadence, stride length, heel to heel base of support, and y-axis range	(1) Significant group differences were found for base of support in all three conditions; wider base in autism than controls. Children with AD were significantly more variable than control & HFASD (2) significant main effects found for stride length & base of support variability. (3) significant	Findings have shown a clear distinction in gait patterning associated with autism and AD, children with AD generally responded differently to the range of gait conditions than the control group, decline in gait performance under conditions involving high level cognitive demands was found in both AD and autism, implicating complex information dysfunction as originally suggested.

			the disorder s.			nt interactions for y-axis range.	
Rodger, Pham, & Mitchell (2009)	Cognitive strategy use by children with Asperger's syndrome during intervention for motor-based goals.	<i>Australian Occupational Therapy Journal</i>	Two case studies demonstrating the use of COOP, while exploring global and domain-specific strategies and types of guidance utilized to improve their task performance.	Case study; 10 weekly individual sessions. Each session used to enhance skill acquisition for each three children chosen goals Each session was videotaped; 2X5 minute sessions were randomly chosen. 4 types of interrater agreement were calculated (duration, duration-sequence, frequency, frequency-sequence)	Agreement ranged from 81-100% for subject 1, and 75-98% for subject 2. Mean percentages were 94% and 89% which are considered excellent	Both utilized cognitive strategies to effectively solve their motor performance problems; COOP appears to have potential as an effective intervention for children with AS. Both children utilized global strategies, used at least three domain-specific strategies in each session, and used limited verbal self-guidance	Perform more studies where children with AS can utilize cognitive strategies to solve motor performance problems.

Sansosti & Powell-Smith	Using social stories to improve the social behavior of children with Asperger's syndrome	<i>Journal of Positive Behavior Interventions</i>	To examine the effectiveness of social stories designed to increase identified target behavior; illustrate how a treatment approach for individuals with AS that incorporates the use of social stories can be applied and evaluated in a naturalistic context.	Individualized social stories created for students to carry on them. Journals used to record where/when and reaction to story	Direct observation was used to code the occurrence of target behaviors using a 15 second partial interval recording system. Each participant was observed for 15 minutes, 3 times a week.	Subject 1 increased sportsmanship by 32%; at baseline, difference between peers was 31%; ended at 4%	According to the multiple-baseline design, data shows increases in social engagement for two of the three participants following the initiation of social story intervention.
Scatone (2007)	Enhancing the conversation skills of a boy with Asperger's disease through Social	<i>Journal of Autism & Developmental Disabilities</i>	To examine the impact of Social Stories combined with video modeling on the	24 Sessions over 15 weeks at a medical center. Social stories were developed to describe target skills; after adults	Effectiveness was assessed by measuring the occurrence of intervals of eye	Eye contact increased 91% Smiling increased 6.4% (not an acceptable amount)	Social stories combined with video modeling were effective in increasing the conversation skills of a boy with Asperger's for two of the three target behaviors.

	Stories and video modeling		conversation skills of a boy with Asperger's Disorder	modeled target skill during a 5-minute taped conversation	contact, smiling, and initiations during 5-minute observations; results graphed as a percentage of intervals	Initiations increased 32.2%	
State & Kern (2011)	A comparison of video feedback and in vivo self-monitoring on social interactions of an adolescent with Asperger's syndrome	<i>Journal of Behavioral Education</i>	To compare the effectiveness of video interactions during activities with a teacher	Video Feedback=Interactive game with teacher, peer, or mother, all sessions videotaped. After, student would watch the video and determine if actions were appropriate than student would self-monitor in Vivo=facilitator modeled appropriate and inappropriate interactions	School intervention rating form (SIRF), adapted from the treatment acceptability rating form: 3-point Likert scale	Video Feedback: Inappropriate actions= mean of 24.8%. Inappropriate noises= mean 37.95%, video feedback= mean 20.59% In Vivo: Inappropriate actions= mean 10.07%, inappropriate noises= mean 10.42%, video	Video feedback resulted in slight reductions in inappropriate interactions and noises; greater reductions were observed during the in vivo self-monitoring intervention.

				; wears a watch that vibrates every minute to self-monitor.		feedback = mean 24.83%	
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References

- American Psychiatric Association. (2018). Summary of text changes from DSM-IV to DSM-IV-TR. Retrieved from <http://www.psychiatry.org/practice/dms/summary-of-text-changes-from-dsm-iv-to-dms-iv-tr>.
- Bock, M.A. (2007). The impact of social-behavioral learning strategy training on the social interaction skills of four students with Asperger syndrome. *Focus on Autism & Other Developmental Disabilities*, 22(2), 88-95. Retrieved from EBSCO Host.
- Cameron, M. J., Shapiro, R. L., & Ainsleigh, S. A. (2005). Bicycle Riding: Pedaling Made Possible Through Positive Behavioral Interventions. *Journal of Positive Behavior Interventions*, 7(3), 153-158. doi:10.1177/10983007050070030401
- Centers for Disease Control and Prevention (2018). Autism, Retrieved from <http://www.cdc.gov/autism/index.html>.
- Emerson, E. (2001). *Challenging behaviour: Analysis and intervention in people with severe intellectual disabilities*. Cambridge, UK: Cambridge University Press.
- Hanley-Hochdorfer, K., Bray, M.A., Kehle, T.J., & Elinoff, M.J. (2010). Social stories to increase verbal initiation in children with Autism and Asperger's disorder. *School Psychology Review*, 39(3), 484-492. Retrieved from EBSCO Host.
- National Institute of Health. (2018). Asperger's syndrome information page. Retrieved from <http://www.nih.gov/disorders/asperger/asperger.html>.
- National Institute of Mental Health. (2018). Autism spectrum disorders (Pervasive developmental disorders). Retrieved from <http://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-pervasive-developmental-disorders/index.shtml>.
- Nayate, A., Tonge, B., Bradshaw, J., McGinley, J., Iansek, R., & Rinehart, N. (2012). Differentiation of high-functioning Autism and Asperger's disorder based on neuromotor

- behavior. *Journal of Autism & Developmental Disorders*, 42(5). 707-717.
doi:10.1007/s10803-011-1299-5.
- Rodger, S., Pham, C., & Mitchell, S. (2009). Cognitive strategy use by children with Asperger syndrome during intervention for motor-based goals. *Australian Occupational Therapy Journal*, 56(2), 103-111. doi:10.1111/j.1440-1630.2007.00719.x
- Sansosti, F. J., & Powell-Smith, K. A. (2006). Using social stories to improve the social behavior of children with Asperger syndrome. *Journal of Positive Behavior Interventions*, 8(1), 43-57. Retrieved from EBSCO Host.
- Scattone, D. (2007). Enhancing the conversation skills of a boy with Asperger's disorder through social stories™ and video modeling. *Journal of Autism and Developmental Disorders*, 38(2), 395–400. <https://doi.org/10.1007/s10803-007-0392-2>
- State, T. M., & Kern, L. (2011). A comparison of video feedback and in vivo self-monitoring on the social interactions of an adolescent with asperger syndrome. *Journal of Behavioral Education*, 21(1), 18–33. <https://doi.org/10.1007/s10864-011-9133-x>