

**Critical Review:
Effectiveness of a peer-mediated social communication intervention in school settings**

Lindsay House
M.Cl.Sc SLP Candidate
University of Western Ontario: School of Communication Sciences and Disorders

This study reports a critical review examining the effectiveness of a peer-mediated social communication intervention in school settings for students with social communication impairments. Study designs include six single-case studies and one randomized control trial. The results of this paper suggest that peer-mediated social communication intervention is an effective treatment for students with social communication impairment.

Introduction

Social communication skills are the words and nonverbal behaviours used in social situations with peers (Timler, Vogler-Elias, and McGill, 2007). These behaviours can include commenting, responding, initiating, or turn-taking. They may be conveyed through the use of a speech-generating device (SGD).

Social communication impairments often co-occur with a number of conditions such as ADHD or Down Syndrome. Autism spectrum disorder (ASD) is a fast-growing developmental disability (Cardon, Wangsgard, and Dobson, 2019) which includes social communication impairments as a defining feature. Individuals with ASD display persistent deficits in social communication and restricted, repetitive patterns of behaviors or interests (American Psychiatric Association, 2013). Although ASD is not the only disorder which may involve social communication deficits, it is one that has been more frequently researched in the literature with respect to social communication difficulties.

As schools are moving toward more inclusive education models, there are more students with ASD and other social communication impairments in general classrooms. Two common intervention approaches for students with social communication difficulties are teacher- and clinician-mediated interventions. However, peer interaction is a more natural occurrence as students spend more time interacting with peers than adults. Peer-mediated intervention (PMI) involves the training of typically-developing peers to model specific skills to encourage interaction between typical peers and peers with social communication problems. The goal of these interventions is to improve the target students' social communication skills (Cardon et al., 2019).

Strong social communication skills are necessary for sustained interaction with peers (Timler et al., 2007). It is important to assess and evaluate possible interventions

that could facilitate the peer engagement of students with social communication impairments.

Objectives

The primary objective of this paper is to critically evaluate existing literature regarding the effectiveness of a peer-mediated social communication intervention in school settings for students with social communication impairments.

Methods

Search Strategy

Computerized databases including Scopus and PubMed were searched using the following search strategy: (social communication) AND (classroom) AND ((peer-mediated*) OR (peer-based)).

Selection Criteria

Studies selected for inclusion in this critical review were required to use a peer-mediated intervention for school-aged children with social communication impairments, measure effectiveness of the intervention, and involve a peer training phase pre-intervention.

Data Collection

The results of the literature search yielded seven studies which met the search criteria. Six of the studies employed a single-case design and the seventh was a randomized control trial.

Results

Single Subject Studies

Single subject studies examine the effects of an intervention within a single participant, who acts as his or her own control. These studies may have one participant or a series of individuals. Individuals participate in a baseline phase followed by an intervention phase. The treatment being studied is considered effective if there is a significant change in

participant response between baseline and intervention phases. Single subject designs provide a high level of evidence; however, sample sizes are often small and results may not generalize to the wider population.

Brain and Mirenda (2019) investigated whether a low-intensity PMI could increase engagement and communicative acts (CAs) of middle-school aged youth with ASD. Three male students (grades 6-8) with ASD were matched based on mutual interests with 2-4 peer coaches from their classroom with strong social skills.

Following 3-4 baseline sessions, peer coaches received two 20-25 minute training sessions in how to use strategies to promote social interaction (e.g., initiating activities, providing help, prompting communication). During intervention, the peer coaches used the strategies they had learned with their classmate with ASD in 10-minute sessions during the lunch break. Outcome measures of this study were engagement (i.e., participating in activities with peers, sharing, or taking turns), CAs (i.e., verbal or nonverbal initiations or responses), mutual enjoyment (i.e., smiling, eye contact, or laughing exhibited by both participant and peer coach), and social validity (i.e., rated by teacher and peers). Experimenters coded occurrence or non-occurrence of peer engagement, initiations, responses, and behaviours indicating mutual enjoyment.

Appropriate statistical analysis was performed. Results of the study showed an increase in engagement and CAs among the students with ASD following peer training. These results were maintained at either one or three follow-up sessions 1-4 weeks post-intervention. A strength of this study was the matching of participants with peers based on mutual interests. Additionally, participants were matched with multiple peers rather than just one. A weakness of this study was the number of follow-up sessions due to the end of the school year.

Overall, this paper provides suggestive evidence that peer-mediated intervention is effective in increasing social communication behaviours of students with ASD.

Cardon et al. (2019) examined whether video modeling (VM) using peers could teach social communication skills to children with ASD in an integrated classroom. Participants included five boys and one girl (ages 39 to 52 months) with ASD in the treatment group, two boys with ASD in the comparison group and two neurotypical peers.

Peers were taught three target social communication skills (sharing puzzle pieces, cooperative block building, and transitions between activities). After practicing the target skills with coaching, the peers were recorded

interacting with each other using the target skills in three short video clips. Baseline and treatment sessions occurred once per day, five days per week. Each session lasted as long as it took for all three target behaviours to be addressed (on average, less than 10 minutes). During two treatment phases, six of the students with ASD were shown the short video clips of their peers, then given a stimulus which would allow them to respond with one of the target skills (e.g., a research assistant saying, "Let's play" while stacking blocks). Researchers recorded whether target children responded appropriately to the stimulus by engaging in one of the three target social communication skills within 10 seconds. The students in the comparison group received treatment-as-usual. A third treatment phase was delivered using a pull-out model during which the participants interacted with a clinician one-on-one in a more individualized setting with less distractions.

Appropriate statistical analysis was performed. Results of this study showed that students receiving VM treatment had higher response rates during the treatment sessions compared to baseline sessions. The two students receiving treatment-as-usual did not show higher response rates; however, they were introduced to VM treatment once the other group had finished all treatment sessions and showed immediate positive gains. Maintenance of target skills and generalization to novel skills were evident in all six of the children receiving VM treatment. A strength of this study was the inclusion of a comparison group. A weakness of this study was that, although peers were used as models in the video clips, participants were interacting with adults rather than peers during both baseline and treatment sessions.

Overall, this paper provides highly suggestive evidence that a peer-mediated intervention using video modeling is effective in increasing the social communication behaviours of preschool students with ASD.

Goldstein et al. (1997) studied the extent to which peer-mediated intervention implemented across the school day resulted in improved social interaction of preschoolers with moderate developmental disabilities. Participants included eight target children with disabilities and eight trained peers across two cohorts of preschoolers (ages 40 to 61 months).

Typical peers were trained in using social communication strategies over three direct instruction lessons and up to two practice sessions. The three strategies taught were maintaining proximity with their buddy, playing with their buddy, and talking with their buddy (stay-play-talk). Baseline and treatment sessions occurred throughout the day during three activities: free play, snack time, and structured activity time.

Information was collected using a video camera. Five social communication acts which were coded by researchers were requests for attention, other requests, comments, responses, and other communicative behaviours.

Appropriate statistical analysis was performed. Results showed consistent improvements in social communication interaction following peer training. When generalization to new trained peers was assessed, seven out of eight target children showed high rates of interaction. A strength of this study was that researchers had typical peers choose target children based on who they would most like to play with. Additionally, researchers compared interactions between target children and typical peers to average interactions between typical peers and children they considered their best friends. Another strength was the use of multiple contexts rather than just one.

Overall, this paper provides highly suggestive evidence that peer intervention can have positive effects on the social communication skills of students with moderate developmental disabilities.

Hansen et. al (2019) studied the effects of a joint attention intervention using trained peers on the response to joint attention behaviours of preschoolers with ASD. Participants included seven target children with ASD and seven trained peers (ages 3-5 years).

Target children participated in separate baseline sessions with an adult interventionist and with their matched peer. During the treatment phase, sessions were 30 minutes in length and consisted of 10 minutes of the adult and target child, 5-10 minutes of the adult and peer interventionist, and 10 minutes of the target child and peer. The adult used a least-to-most prompting hierarchy and edible reinforcement to teach joint attention skills to target children. Peer training involved a social narrative and simple comprehension questions using modeling, feedback, social praise, and tangible reinforcers. During sessions with peers, the children played together at learning stations in the classroom. The adult interventionist was present to support play and regularly reminded the trained peer to make a bid for joint attention if needed. Joint attention responses which were coded were gaze shifts, head turns, and body reorients toward an object following a joint attention initiation.

Appropriate statistical analysis was performed. Results of this study showed that all seven target children demonstrated an increase in response to joint attention bids made by peers during the intervention phase. A weakness of this study was the lack of follow-up sessions

after termination of treatment. Additionally, intervention sessions were highly controlled with respect to setting and activities.

Overall, this paper provides suggestive evidence that a peer-mediated joint attention intervention is an effective way to increase response to joint attention of students with ASD.

Thiemann-Bourque et al. (2017) conducted a study to investigate the effects of a peer-mediated intervention using SGDs on the social communication of nonverbal or minimally verbal preschool children. Participants included three children (ages 4;5 to 4;7) with ASD who were beginning SGD users and three typically-developing peers with age-appropriate social skills.

During baseline sessions, target children and their peer played together at centers in their classroom. A SGD (GoTalk4+) was placed on the table between them. This device was a board with four slots where pictures could be inserted. During baseline, pictures that related to the activity were displayed on the device, but no prompts were provided for how to use the SGD. Peer-mediated training followed the baseline phase and consisted of three 30-minute sessions. During training, peers were taught how to *stay* with their friend, *play* with their friend, *talk* with their friend, *get attention*, and *hold and wait*. Training included role play, feedback, and reinforcement. Following training, target children and peers participated in 6-minute social activities twice per week over ten weeks (15-18 sessions). The implementer observed sessions and prompted the children to initiate communication when needed using a least-to-most hierarchy. Dependent variables recorded during this study were total rates of initiations and responses, mode of communication (speech, SGD, or gesture) and function of communication act within each social activity (gain attention, comment, request, or share). After six weeks of intervention, two additional contexts were introduced. First, authors investigated the effect of introducing cause-and-effect toys with lights and sounds. Subsequently, the authors explored the effects of a snack context.

Appropriate statistical analysis was performed. Results of this study showed moderate effects on rates of communication for all three children with ASD. All three children also showed a large increase in communication acts when the new contexts were introduced. A strength of this study was the inclusion of multiple contexts. A weakness of this study was the lack of follow-up sessions after the termination of treatment.

Overall, this paper provides suggestive evidence that a peer-mediated intervention can increase the social communication of students with ASD who use SGDs.

Trottier et al. (2011) studied whether a peer-mediated intervention while playing a social game could lead to an increase in spontaneous appropriate CAs by students with ASD who use SGDs. Target children in this study were two 11-year-old boys from different schools with ASD. Each target child was matched with three typically-developing peers from the same class.

Baseline sessions took place in rooms located in the target children's schools. During baseline sessions, they played a preselected game (either Bingo or a matching game) with the SGD on the table. The trainer remained nearby to observe and provide support to the child with ASD if needed for the game. Sessions in intervention phase I occurred 2-4 times per week and lasted as long as it took for one of the boys to win the game. During this phase, the adult trainer provided the peers with prompts. Adult trainer prompts were faded gradually until trained peers could provide support to the target child on their own (either seven or nine sessions). During intervention phase II, the adult trainer provided minimal or no prompts to trained peers. These sessions occurred 2-4 times per week and lasted until one of the children won the game. Information coded by the primary observer were the number of CAs produced by target children per session (gesture, verbal utterance, vocalization, or SGD activation) and whether each CA was prompted or spontaneous.

Appropriate statistical analysis was performed. Results of this study showed an increase in spontaneous appropriate CAs for both target children after intervention phase I was initiated. For both target children it was noted that as prompted appropriate CAs decreased, spontaneous appropriate CAs increased. However, the rate of spontaneous CAs for one of the target children was highly variable due to cheating behaviour that began in intervention phase II. This target child began cheating during his turn, and activating the "you're cheating" button on his SGD. This behaviour was reinforced by the peers' laughter and continued for several sessions.

This study was well-designed and implemented. However, because there were only two target children and one of the boys displayed variable behaviours during intervention phase II, this paper provides somewhat suggestive evidence that a peer-mediated intervention involving social games is effective in increasing social communication in children with ASD who use a SGD.

Randomized Control Trials (RCTs)

Randomized control trials are experimental studies that evaluate the effects of a specific intervention through randomly assigning participants to either an experimental group or a control group. Those in the experimental group receive the treatment being studied and those in the control group receive either a standard intervention (e.g., treatment-as-usual) or no intervention at all. RCTs with large sample sizes provide a high level of evidence.

Thiemann-Bourque et. al (2018) conducted an RCT over four years with 45 children with ASD (ages 2;11 to 5;0) and 95 peers without disabilities (ages 3;4 to 5;1). The authors studied whether a peer-mediated approach would lead to better communication outcomes of children with ASD using SGDs compared to a business-as-usual approach with peers who were not trained.

Children were matched based on key variables, then randomly selected for either the treatment or comparison group. During baseline sessions, the target children interacted with peers and were simply instructed to stay together and play nicely. Training of peers in the treatment group occurred after baseline sessions and took approximately 80 minutes over two to three days. Peers learned the following strategies: *stay* with your friend, *play* with your friend, *talk* with your friend, *get attention*, and *hold and wait*. The training protocol involved practice, feedback, and reinforcement. Pairs in the treatment group met for 15 minutes, two to three times per week during the treatment phase (range of 17-31 sessions). The implementer was present during these sessions and provided prompts if communication was not observed between the children. Pairs in the comparison group participated in one weekly 15-minute session (range of 9-14 sessions). Total communication acts within 10-minute intervals of target children toward peers were coded by trained assistants.

Appropriate statistical analysis was performed. Results of this study showed that target children in the treatment group responded at similar rates to children in the comparison group during baseline, but significantly outperformed the comparison group in subsequent phases. Children's response rates in the comparison group remained stable across phases, whereas target children's response rates in the treatment group improved significantly during treatment and the generalization phase with a trained peer, remained stable during maintenance sessions four to eight weeks post-intervention, and declined during generalization with unfamiliar peers. Strengths of this study were the number of participants, the use of equivalent groups through matching and randomization, and the use of two generalization settings.

Overall, this paper provides compelling evidence that a peer-mediated intervention has positive effects on the social communication of children with ASD who use SGDs.

Discussion

Overall, the findings of all seven studies presented in this paper indicate that peer-mediated intervention is an effective way to increase the social communication behaviours of students with ASD or other social communication impairments. However, six of the seven studies employed a single-case design with small numbers of participants. This decreased the level of evidence presented in the studies. Additionally, as the majority of research in this area focuses on students with ASD, the evidence from the current critical review may not necessarily be generalized to students with social communication impairments which co-occur with other disorders. Variation in whether or not studies included a follow-up phase makes it more difficult to determine whether this type of intervention has long-term effects on students' social communication behaviours.

Some conditions may have affected study results. Studies which included comparison groups (Cardon et al., 2019; Thiemann-Bourque et al., 2018) demonstrated that results were due to treatment conditions and not simply target children becoming more familiar with their peer partners. Studies which paired target children with more than one peer (Brain and Mirenda, 2019; Thiemann-Bourque et al., 2018; Trottier et al., 2011) placed less responsibility on each trained peer and facilitated a more natural play context as children often play with more than one other child. Studies which matched children based on mutual interests or preferences (Brain and Mirenda, 2019; Goldstein et al., 1997; Hansen et al., 2019) facilitated a more natural interaction for both children. Those which included multiple contexts (Goldstein et al., 1997; Thiemann-Bourque et al., 2018; Thiemann-Bourque et al. 2017) demonstrated whether skills could be generalized to different settings and showed how motivation may affect results. Although many authors did not explicitly note when in the school year the study took place, Goldstein et al., (1997) purposefully began their study 10 or more weeks into the school year to allow participants to get to know one another. This likely prevented the results from being greatly affected by participants becoming more familiar with each other as the study progressed.

In summary, each of the studies had varying methods and outcome measures, provided differing levels of evidence, and had different strengths and weaknesses. However, all seven studies provided complementary evidence in support of using peer-mediated social communication

interventions. When implemented in way that is consistent with the current evidence, this intervention approach appears to be effective in increasing social communication behaviours and encouraging the formation of friendships among peers.

Future Research

Future studies should examine the effects of peer-mediated social communication interventions on children with social communication impairments which co-occur with conditions other than ASD so results can be better generalized to the wider population. Additionally, there should be more randomized control trials with larger sample sizes which implement conditions such as the use of a comparison group, the inclusion of multiple trained peers rather than just one, matching trained peers to target children based on mutual interests or preferences, the use of multiple contexts, and which occur at a later time within the school year.

Clinical Implications

The studies presented in this paper provide evidence ranging from suggestive to compelling that peer-mediated intervention is effective in improving social communication behaviours of children with social communication impairments. Due to the variable yet still promising evidence, speech-language pathologists (SLPs) may cautiously conduct this kind of intervention with children who have social communication impairments, especially those with ASD.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
- Brain, T., & Mirenda, P. (2019). Effectiveness of a low-intensity peer-mediated intervention for middle school students with autism spectrum disorder. *Research in Autism Spectrum Disorders*, 62, 26-38.
- Cardon, T., Wangsgard, N., & Dobson, N. (2019). Video modeling using classroom peers as models to increase social communication skills in children with ASD in an integrated preschool. *Education and Treatment of Children*, 42(4), 515-536.
- Goldstein, H., English, K., Shafer, K., & Kaczmarek, L.

- (1997). Interaction among preschoolers with and without disabilities: Effects of across-the-day peer intervention. *Journal of Speech, Language, and Hearing Research*, 40(1), 33-48.
- Hansen, S. G., Raulston, T. J., Machalicek, W., Frantz, R., Drew, C., Erturk, B., & Squires, J. (2019). Peer-mediated joint attention intervention in the preschool classroom. *The Journal of Special Education*, 53(2), 96-107.
- Thiemann-Bourque, K., Feldmiller, S., Hoffman, L., & Johner, S. (2018). Incorporating a peer-mediated approach into speech-generating device intervention: Effects on communication of preschoolers with autism spectrum disorder. *Journal of Speech, Language, and Hearing Research*, 61(8), 2045-2061.
- Thiemann-Bourque, K. S., McGuff, S., & Goldstein, H. (2017). Training peer partners to use a speech-generating device with classmates with autism spectrum disorder: Exploring communication outcomes across preschool contexts. *Journal of Speech, Language, and Hearing Research*, 60(9), 2648-2662.
- Timler, R., Vogler-Elias, F., & McGill, F. (2007). Strategies for Promoting Generalization of Social Communication Skills in Preschoolers and School-aged Children. *Topics in Language Disorders*, 27(2), 167-181.
- Trottier, N., Kamp, L., & Miranda, P. (2011). Effects of peer-mediated instruction to teach use of speech-generating devices to students with autism in social game routines. *Augmentative and Alternative Communication*, 27(1), 26-39.