

Critical Review:
For children and adolescents with Complex Communication Needs (CCN), does Peer-Mediated Intervention (PMI) positively impact social relationships and friendship?

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Communication is essential for the creation and maintenance of friendships and social participation. One of the central goals for children and adolescents with Complex Communication Needs (CCN) is to develop these friendships and social relationships. Interventions that promote peer interaction are integral for children with CCN. This critical review examines the evidence regarding Peer-Mediated Intervention (PMI) and its impact on the formation of friendships and social interaction. The evidence gathered herein supports the use of PMI to facilitate increased, positive peer interactions for children and adolescents with CCN. Further research is needed regarding the specific impact of PMI on the formation of friendships for children with CCN. Recommendations for future research and clinical implications are provided.

Introduction

Social participation and peer interactions are vital throughout both children's and adolescents' development, gaining importance in preschool and remaining significant throughout life (Batorowicz, Campbell, Von Tetzchner, King, & Missiuna, 2014; Therrien & Light, 2018). This social participation is a prerequisite for the formation of friendships (Batorowicz et al., 2014). The interactions and relationships children and adolescents have with their peers are the primary means through which they learn academic, vocational and social skills (Carter et al., 2014). Relatedly, the formation of satisfying relationships has implications for a student's sense of belonging, school satisfaction, acceptance among peers, and overall well-being (Carter et al., 2014). The International Classification of Functioning, Disability and Health (ICF) has identified that social participation is a vulnerable area for people affected by a disability (World Health Organization [WHO], 2001). Students with disabilities are at a large risk for reduced participation due the barriers and limitations they encounter (Thirumanickam, Raghavendra, & Olsson, 2011). The social bonds and connections that children and adolescents form have been found to have both psychosocial and academic impacts (Batorowicz et al., 2014).

Students with CCN are unable to meet their communicative needs through verbal output due to developmental or acquired disabilities, and may benefit from the use of augmentative and alternative communication (AAC) (Therrien & Light, 2016; Therrien & Light, 2018). Biggs, Carter, and Gustafson (2017) suggested that young people with CCN may

experience particular difficulties connecting with their peers even relative to others with disabilities, due to the additional obstacle that is their ability to communicate (Therrien, Light, & Pope, 2016). Communication is the mechanism through which young people share, internalize and reflect on their experiences (Smith, 2015). Thus, children and adolescents with communication difficulties are at an increased risk for decreased social participation and opportunities (Thirumanickam et al., 2011; Batorowicz et al., 2014). In addition to the intrinsic barriers associated with communication challenges, young people with CCN also encounter peer barriers (Therrien, Light, & Pope, 2016). In particular, peer attitudes and behaviours are often an obstacle to the formation of friendships (Biggs et al., 2017).

Due to these reduced social opportunities and limited interactions with peers (Asmus et al., 2017; Batorowicz et al., 2014), students with CCN have fewer same-aged peers, friends, and acquaintances compared to those without disabilities, as well as small social networks and a limited number of communication partners (Thirumanickam et al., 2011; Raghavendra, Olsson, Sampson, McInerney, & Connell, 2012). Such findings confirm the need for interventions that support friendship development across contexts to extend the social networks of students with CCN (Raghavendra et al., 2012). Providing more opportunities for students with CCN to have positive interactions and experiences with peers may foster this friendship development (Batorowicz et al., 2014).

One intervention approach with the aim of increasing interactions between children and adolescents with disabilities and their peers is Peer-Mediated Intervention

(PMI; Biggs et al., 2017). In PMI, a peer without disabilities provides academic and/or social support to a classmate with a disability with guidance from a qualified adult (Biggs et al., 2017; Carter et al., 2014). PMI capitalizes on peers becoming the primary focus of intervention, in which they model, scaffold, and naturally reinforce appropriate socio-communicative behaviours (Simpson & Bui, 2016). By strengthening the peer's capacity to become an effective social partner, interactions between children with and without disabilities may be more likely to be initiated, reinforced and maintained. PMIs have been associated with improvements in the quality of peer interactions, increases in the frequency of peer interactions, enhanced social connections, social and communication skill development, and the development of new friendships with a broader group of peers (Chung, Carter, & Sisco, 2012a; Carter et al., 2014). Moreover, these peer interactions provide ongoing, authentic and relevant opportunities for students with CCN to acquire skills that support learning, inclusion and independence (Chung et al., 2012a).

Various studies have noted a passive communication role of children or adolescents with CCN in their interactions with their communication partners (Raghavendra et al., 2012). In these interactions, they indicate that communication partners typically dominate the interaction (Batorowicz et al., 2014). Consequently, Batorowicz et al. (2014) suggest that friendships that exist between students with CCN and those without disabilities may be more asymmetric in nature than those between typically-developing students. They attribute this postulation to the idea that friendships between students with CCN and those that are typically-developing are more likely to be 'helping relationships', where the peer becomes the helper and the student with CCN becomes the recipient of help (Therrien & Light, 2016). Equality is one of the main relationship properties that distinguishes a relationship of acquaintance from a friendship (Therrien & Light, 2016). Though the positive impact of PMI on increased interactions is noted in the literature, prior studies have suggested that PMIs may be more likely to establish inequality in the relationship between children with and without disabilities, which can negatively impact friendship development (Therrien & Light, 2016; Therrien & Light, 2018).

Communication is essential for the creation and maintenance of friendships. Few studies have examined how to promote social communication skills that foster friendships for students with CCN. Therefore, research is needed regarding interventions that encourage the development of close and durable peer relationships and friendships between students with and without CCN.

Objective

The objective of this critical review is to examine the evidence related to the impact of Peer-Mediated Intervention (PMI) on friendship development and social outcomes for children with CCN.

Methods

Search Strategy

Articles related to the topic of interest were found using the following computerized databases: ProQuest, PubMed, SAGE Journals, Google Scholar, and the Western Library. Keywords used for the database search were as follows: (peer-mediated instruction) OR (peer support arrangement*) AND (complex communication needs) OR (complex communication challenges) AND (peer interaction) OR (social interaction) OR (friendship*) OR (social relationship*). The search was limited to articles written in English. Reference lists of previously searched articles were also used to obtain other relevant studies.

Selection Criteria

Studies selected for inclusion in this critical review were required to investigate the impact of PMI on friendship development, social relationship formation, or social interaction for students with CCN. All subjects were required to be between the ages of 3 and 18 and described as speech, language, or communication impaired by either parent report, teacher report, or diagnostic evaluation. There were no limits set on the demographics of the research participants.

Data Collection

This literature search yielded six articles congruent with the aforementioned selection criteria, including two randomized control trials (Asmus et al., 2017 and Carter et al., 2016) and four multiple baseline across participants, single subject designs (Biggs et al., 2017; Therrien & Light, 2016; Therrien & Light, 2018; and Thiemann-Bourque, McGuff, and Goldstein, 2017).

Results

In their multi-site, longitudinal, randomized control trial (RCT), *Asmus et al. (2017)* examined the long-term efficacy of peer network interventions to improve the social connections of 95 high school students with severe disabilities compared to 48 'business-as-usual' controls. A total of 192 peers without severe disabilities participated in the peer network groups after receiving training from 41 school staff that served as facilitators

and provided guidance throughout the intervention. The facilitators were trained by the research team. Peers were trained regarding facilitative, student-specific strategies and how to be a positive model. The peer network intervention involved social groups of 3-6 peers and a focus student meeting once per week throughout one semester, outside of classroom time. Outcome measures included study-specific measures and student report to evaluate social contacts, friendship gains, and maintenance and generalization information, a questionnaire for social validity, and a psychometrically-sound rating scale to evaluate social skills. These measures were completed at four different time points – pre-intervention, post-intervention, one semester follow up, and two semesters follow up. Results revealed substantial improvements in the reported social relationships of students with disabilities, including increases in social contacts and number of friends without disabilities. As well, social contacts between peer partners and focus students were reported at follow up in the next semester and one year post. Teacher-reported data showed parallel results.

Strengths of this study include a strong design, an adequate sample size, detailed inclusion criteria and intervention procedures, high treatment fidelity and social validity, and the use of appropriate scales, assessments, and data analysis techniques to evaluate various outcome variables. Limitations of this study include the absence of direct observations of the quality and quantity of interactions between focus students and their peers, and the fact that peers were not necessarily age-matched to the focus students.

Overall, this study provides compelling evidence that strengthening social connections between students with and without CCN is possible and effective via regular, supported opportunities to interact during non-instructional contexts, and that these peer-mediated interventions facilitate increased social contacts and friendship development.

Using a multiple-probe across participants design, *Biggs et al. (2017)* investigated the efficacy and social validity of peer support arrangements for 4 middle school students (ages 10-16) with CCN who used an AAC device. Each student was grouped with 2 classmates without disabilities that served as peer partners ($n = 8$). Peers received training from members of the research team regarding how to provide academic, social, and communication support to focus students using four general AAC interaction strategies – provision of communication opportunities, expectant delay, prompting, and responding appropriately, as well as individualized, focus-student specific strategies outlined during a collaborative planning meeting between the

research team and the special education team. Trained paraprofessionals facilitated interactions and provided support. The intervention involved peers sitting in close proximity to the focus students on a daily basis in the classroom over the course of a semester, providing support via the use of the strategies taught. Outcome measures included a checklist for treatment implementation, a social validity questionnaire completed at the end of the semester, and observational measures conducted two to four times per week across the baseline, intervention, and generalization conditions. Results demonstrated increased engagement in a variety of social and academic interactions, more frequent initiations, and increased communication to and from peers. Regarding social validity, focus students and peers considered each other friends. School staff felt positively about collaborative planning and peer support arrangements, and paraprofessionals facilitated peer support with fidelity.

Strengths of this study include the specification of inclusion criteria for students with CCN, the use of age-matched participants, high intervention fidelity and social validity, and the use of appropriate assessments and data analysis techniques to evaluate the intervention. Limitations of this study include the absence of a measure of the quality or appropriateness of focus student communication, a small sample size, variability in the diagnoses of the focus students, and generalization data that is limited to one participant.

Overall, this study provides suggestive evidence that collaborative planning, the use of AAC interaction strategies, and peer support arrangements can increase peer interaction and friendship development for students with CCN, and that a peer-mediated approach is feasible to implement and positively-viewed by educational staff.

In their randomized, controlled experimental study, *Carter et al. (2016)* examined the efficacy and acceptability of peer support arrangements to improve social and academic outcomes for 51 students with severe disabilities in high school general education classrooms compared to 48 students receiving adult-delivered support only. Peers ($n = 106$) received training from facilitators (paraprofessionals and special educators assigned to specific focus students) regarding the use of individualized, focus student-specific peer support strategies outlined during a collaborative planning meeting between the research team and the special education team. Classroom observations of social interactions between students with CCN and their peers took place during three, full-length class periods at the beginning and end of the semester, collected over a two- to three-week period. Additional outcome

measures completed at the beginning and end of the semester included a study-specific measure to evaluate friendship gains and a psychometrically-sound rating scale and goal attainment scaling for the evaluation of social goals and skills. Additionally, a social validity survey was completed at the end of the semester. Normative peer comparison data was collected using the same observational measures. The intervention involved one or more peers sitting in close proximity to the focus students in the classroom, providing social and academic support via the use of the strategies taught as they worked together on a daily basis throughout the semester on activities organized by the classroom teacher. Results revealed increased interactions between high school students with severe disabilities and their peers, increased academic engagement, increased social participation, progress on individualized social goals, and an increased number of friendships. Moreover, more than 90% of peers and focus students reported considering each other friends. Persistence of these relationships dropped to approximately 40% in the following semester and about 15% at one year post.

Strengths of the study include a strong design that includes a control group and normative peer comparisons, high fidelity for facilitator implementation, the inclusion of follow up measures, the specification of participant inclusion criteria, the availability of generalization and durability information, the use of appropriate scales, assessments, and data analysis techniques, high social validity, an adequate sample size, the inclusion of a diverse set of classrooms and schools, and high inter-observer agreement. Limitations of the study include the fact that friendship data was reported by adults rather than students, that generalization data was not explored in other general education classes, and that data was informed by observation and teacher-report, which are both subject to bias.

Overall, this study provides compelling evidence that peer support arrangements are effective in improving social outcomes and fostering friendship development for students with CCN.

In their single subject, multiple-probe across partners design with one replication, *Therrien and Light (2016)* evaluated the effectiveness of peer-mediated strategies and iPad use to facilitate interaction between 2 preschool children (ages 4:2 and 4:10) who used AAC and 6 of their peers (ages 3- to 6-years-old) without disabilities. Peer groups consisted of 1 student with CCN and 3 students without disabilities, where the students worked in dyads. Both the children with CCN and their peers received turn-taking training using an iPad with the AAC application GoTalk NOW, pre-

programmed with visual scene displays. During the intervention, the children with CCN and a peer engaged in storybook reading outside of the classroom for 10 minutes using the iPad, occurring 1 to 3 times per week over the course of 3 months. Outcome measures included observations conducted for every session across the baseline, intervention, and generalization conditions, as well as student report and questionnaires completed by parents, Speech-Language Pathologists (SLPs) and teachers during and after intervention to evaluate social validity. Results demonstrated maintained gains in the frequency of communicative turns for one of the children with CCN across all three peer partners post-intervention. Conversely, initial gains were not maintained over time for the second child. Overall, neither the children with CCN nor their typically-developing peers were considered the helper or the receiver of help, alluding to an equal balance in the relationships formed.

Strengths of this study include the specification of inclusion criteria for both children with CCN and the typically-developing peers, stringent selection criteria for the books used in the intervention, high social validity, high inter-observer reliability, and the use of appropriate data analysis techniques. Limitations of the study include a small sample size, mixed results and a lack of maintenance data for one of the children with CCN, and the fact that the relative importance of each component of the intervention package cannot be established.

Overall, this study provides suggestive evidence that a packaged intervention including dyadic social interaction training paired with the provision of AAC in peer support arrangements encourages more social interaction between children with CCN and their peers without instilling an unequal status relationship.

Using a multiple-probe across dyads design, *Therrien and Light (2018)* expanded on their previous study and investigated the impact of a multicomponent intervention on the social communication and joint engagement of 5 preschool children (ages 3:9 to 5:10) with CCN and ASD and 5 peers (ages 3:11 to 4:11) without disabilities. Peer dyads consisted of 1 student with CCN and a typically-developing peer, where 3 dyads comprised Cohort 1 and the remaining 2 dyads comprised Cohort 2. During the intervention, the children with CCN and a peer engaged in storybook reading outside of the classroom for 10 minutes using the iPad, occurring 1 to 3 times per week over the course of 3 months. Following the 10-minute intervention probe, both the children with CCN and their peers received turn-taking training. Outcome measures included observations conducted for every

session across the baseline, intervention, and generalization conditions, as well as student report and questionnaires completed by parents, SLPs and teachers during and after intervention to evaluate social validity. Results indicated that all three children with CCN took significantly more turns during the intervention than during baseline in Cohort 1. Moreover, the average frequency of turn-taking during generalization probes increased from baseline. In Cohort 2, results were less conclusive. Joint engagement increased for all five dyads from baseline to intervention. Notably, all peers took more turns during the intervention phase as compared to baseline, with no subsequent negative impact on turn balance. Most of the peers, parents, SLPs and teachers felt positively about the intervention and its impact on the dyad's communication.

Strengths of this study include the specification of inclusion criteria for both peers and children with CCN, procedural integrity, the use of appropriate data analysis techniques, high social validity, and high inter-observer reliability. Limitations of the study include a small sample size and a heterogeneous population of children with CCN (both of which limit external validity), inconclusive results in Cohort 2, the absence of maintenance data and limited generalization data due to the timing of the study, and the fact that the relative importance of each component of the intervention package cannot be established.

Overall, this study provides suggestive evidence that a social intervention paradigm including peer support arrangements, evidence-based strategies, and AAC is effective in promoting peer interaction between children with CCN and their typical peers without instilling an unequal status relationship.

In their multiple-probe across participants design, *Thiemann-Bourque, McGuff, and Goldstein (2017)* examined the effects of PMI and speech-generating device (SGD) instruction for 3 preschoolers (ages 4:5 to 4:7) with severe ASD and 3 of their peer partners (ages 4:5 to 4:6). The 3 peers without disabilities were trained use a GoTalk 4+ speech generating device (SGD) and to be responsive communicators and play partners using a social intervention called Stay-Play-Talk. During the intervention, peers were paired with a classmate with ASD in 6-minute social activities in the classroom twice per week. The intervention spanned 15-18 sessions over the course of 10 weeks. Observational measures were conducted for every session across the baseline, intervention, and generalization conditions. Results indicated that all three children with ASD demonstrated improved communication reciprocity and peer engagement, as well as increased initiations and responses, indicating improved ability to participate in

socio-communicative exchanges. Moreover, all three peers demonstrated increased communication acts toward their classmates with ASD. These improvements appeared to generalize to other classroom contexts.

Strengths of this study include the specification of inclusion criteria for children with ASD and their peers, SLP consultation regarding the programming of SGD displays, the use of appropriate data analysis techniques, high inter-observer reliability, and high implementation fidelity. Limitations of the study include a small sample size, a lack of maintenance information regarding gains post-intervention, a lack of information regarding generalizability to new communication partners or settings outside of the classroom, and a narrow focus on basic communication skills for children with ASD.

Overall, this study provides suggestive evidence that peer-mediated SGD intervention facilitates increased communicative acts and positive changes in reciprocal communication exchanges, providing opportunities for both children with CCN and their peers to engage in positive social interactions.

Discussion

This critical review provides suggestive-to-compelling evidence across six studies that students who receive PMI experience positive social gains, including increased social participation and friendship development (Asmus et al., 2017; Carter et al., 2017). Further, many of the friendships that are formed are maintained over time, some of which generalize to other settings (Asmus et al., 2017; Carter et al., 2016; Thiemann-Bourque, McGuff, & Goldstein, 2017). Fidelity and social validity data reveal that special educators and paraprofessionals feel effective in their role as facilitators, demonstrating that peer support arrangements are feasible to implement (Asmus et al., 2017; Biggs et al., 2017). Moreover, both students with CCN and peer partners view peer support arrangements positively, considering each other as friends (Asmus et al., 2017; Biggs et al., 2017; Carter et al., 2017).

The six studies reviewed above varied across several dimensions. The first way in which these studies varied was regarding whether the intervention was implemented within the classroom or within another school context. Half of the studies implemented the intervention within the classroom, whereas the remaining three studies implemented the intervention outside of the classroom during lunch, recess, extracurricular activities, or in other rooms within the school. This demonstrates that regardless of whether the intervention takes place within or outside of the classroom, the use of peer support arrangements can

increase social contacts and strengthen social connections between students with CCN and their peers.

A second way in which the studies varied was regarding whether the intervention was single- or multi-component in nature. Half of the studies trained peers using both interaction strategies and AAC, whereas the remaining three studies trained peers using interaction strategies alone. Though all studies alluded to the positive impact that PMI has on social outcomes, multi-component interventions may facilitate a more equal balance in the social relationship. Pairing AAC with interaction strategies, like in Therrien and Light (2016; 2018) and Thiemann-Bourque, McGuff and Goldstein (2017), provides dyads with a shared means of communication, aiding both students as a general support as opposed to being a dedicated technology for a single student.

A third way in which the studies varied was regarding whether both the peer and the student with CCN were trained or just the peer only. Both the peers and the students with CCN were trained in Therrien and Light (2016; 2018), whereas the remaining four studies trained the peers only. Regardless of training specifications, all studies demonstrated that the use of PMI can result in improved social outcomes for students with CCN. Although, training both the peers and the students with CCN may result in a more equal status relationship. In these cases, the peer is not trained to be a ‘helper’. Rather, both the student with CCN and the peer are trained to be effective communication partners.

The final way in which the studies varied was in terms of the frequency in which the PMI took place, wherein intervention occurred once per week in Asmus et al. (2017), twice per week in Thiemann-Bourque, McGuff, and Goldstein (2017), one to three times per week in Therrien and Light (2016; 2018), and daily in Biggs et al. (2017) and Carter et al. (2016). This demonstrates that implementing PMI as infrequently as once per week can strengthen social connections and facilitate friendship development for students with CCN.

Previous studies have labelled students with CCN as ‘passive communicators’ or ‘responders’, rarely initiating and regulating socio-communicative exchanges (Batorowicz et al., 2014). As such, many have held the belief PMI can establish a relationship hierarchy, promoting inequality in the relationship between children and adolescents with CCN and their peers. Batorowicz et al. (2014) combats this, suggesting that the extent to which a child or adolescent is a passive or active communicator may be dependent upon that student’s relationship with each individual communication partner. Thus, the ‘helping’ relationship

may stem from the mere lack of social relationships between students with CCN and their peers in general, wherein students with CCN fall into a passive role because of the quality of the social relationship itself.

Positive social interactions between children and adolescents with CCN and their peers offer rich opportunities for students with CCN to learn and practice various social and communicative skills in meaningful and motivating contexts (Biggs et al., 2017). Engaging peers in intervention creates naturalistic, sustainable transfer opportunities for communication skills during authentic interactions between students with CCN and their peers (Smith, 2015). Thus, the use of PMI can both increase and expand opportunities for children with CCN to participate socially with their peers, positively impacting their progress on socio-communicative goals and facilitating friendship formation (Carter et al., 2017).

Future studies should investigate PMI and its impact on the extension of social contacts beyond the school setting in a wider variety of social contexts (Asmus et al., 2017; Therrien, Light, & Pope, 2016; Thiemann-Bourque, McGuff, & Goldstein, 2017). Additionally, research that includes follow-up data is needed to evaluate the durability of peer relationships following PMI (Carter et al., 2016). Further, information is needed regarding how peer intervention specifically impacts friendship formation, with an explicit focus on the variables that impact friendship development and how those variables can be targeted using peer support arrangements (Therrien, Light, & Pope).

Clinical Implications

The evidence aforementioned is sufficient to guide practice in that Speech-Language Pathologists (SLPs) can confidently use PMI to target socio-communicative goals for children with CCN. The research above demonstrates that PMI for students with CCN can bridge the gap between special and general education, wherein peer support arrangements can lead to positive social outcomes (Biggs et al., 2017). Clinically, it is vital for SLPs to create opportunities for students with CCN to engage with their typically-developing, same-aged peers, interacting throughout meaningful, functional activities (Thirumanickam et al., 2011). These opportunities for interaction facilitate the development of age-appropriate competencies. Involving peers as communication partners reduces barriers to the formation of social relationships between those peers and the students with CCN, encouraging friendship development and age-appropriate social engagement (Thirumanickam et al., 2011).

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