Peer-Mediated Intervention for Social Communication Difficulties in Adolescents with Autism: Literature Review and Research Recommendations

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Abstract—Adolescents with Autism Spectrum Disorders (ASD) often experience social-communication difficulties that negatively impact their social interactions with typical peers. However, unlike other age and disability groups, there is little intervention research to inform best practice for these students. One evidence-based strategy for younger students with ASD is *peer-mediated intervention (PMI)*. PMI may be particularly promising for use with adolescents, as peers are readily available and are natural experts for encouraging authentic high school conversations. This paper provides a review of previous research that evaluated the use of PMI to improve the social-communication skills of students with ASD. Specific intervention features associated with positive student outcomes are identified and recommendations for future research are provided. Adolescents with ASD are targeted due the critical importance of social conversation at the high school level.

Keywords—Autism, peer-mediation, social communication, adolescents.

I. INTRODUCTION

DIFFICULTIES with communication and social interaction are hallmark characteristics of individuals with Autism Spectrum Disorders (ASD) [1]. Specific challenges may include engaging in social conversations, being aware of and understanding non-verbal cues, and establishing peer friendships. These difficulties may become especially apparent during adolescence when social activity, peer relationships, and the desire to fit in are arguably the most salient [2]. Adolescents with ASD may lack the necessary language skills to communicate effectively with peers, may struggle with initiating conversations, and may experience problems responding appropriately to social interactions [2], [3]. Research indicates that without effective intervention and support during the high school years, students with ASD are at risk for anxiety, loneliness, depression, and other poor post-school outcomes [4].

A variety of intervention strategies have been used to improve the social-communication skills of individuals with ASD. One promising intervention, now considered to be an evidence-based strategy for promoting social-communication in younger children with ASD, is peer-mediated intervention (PMI). PMI involves providing information, training, and/or support to typically-developing peers in an effort to facilitate social interactions with children with ASD [5]. Unlike adult-mediated approaches, with PMI, peers are the primary focus of intervention efforts. However, there is considerable variability in the specific procedures used across PMI studies. For example, while some investigations involve peers as trainers of students with disabilities [6]-[9], in other studies, peers serve solely as interaction partners during the training phase or during generalization sessions [10], [11]. While some researchers provided instruction to peers prior to interacting with the students with ASD [6]-[9], [12], other investigators provided peer instruction prior to, or during, generalization sessions [10], [11]. Adult involvement also varies across studies, with adults often monitoring and/or prompting peers to use their strategies, but typically not intervening directly with the target child [13].

II. PMI FOR YOUNG CHILDREN WITH ASD

A recent meta-analysis [14] investigated the efficacy of PMI for promoting social interactions among young children (birth to 8 years of age) diagnosed with ASD. The overall effect sizes suggested that PMI is highly effective for this age group. In fact, PMI is now considered to be an evidence-based strategy for young children with ASD [15]. Use of PMI with preschool and elementary-aged children with ASD has been shown to increase the frequency and quality of peer interactions, social connections, friendships, and social communication skills [16]-[19]. Despite the wealth of data to support its efficacy with young children, few social-communication studies have evaluated the use of PMI with adolescents with ASD [20]-[22]. However, PMI may be particularly promising with this age group as it involves peers who are readily available, relatively skilled, and are natural experts for encouraging authentic high school conversations [23].

III. PURPOSE AND METHOD

This paper provides a critical review of published research evaluating the use of PMI to improve social-communication skills of adolescents with ASD. The review identifies critical intervention features associated with positive student outcomes and provides specific recommendations for future research with this population. Adolescents with ASD are targeted due the critical importance of social conversation at the high school level [3], [24], [25].

To locate the studies, an electronic search was conducted using *ERIC* and *PsychINFO* search databases. Keywords

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included autism, autistic, social interaction, social behavior, social competence, social skills, socialization, peer relationship, and adolescent. All studies reviewed met the following inclusion criteria: (a) evaluated a PMI strategy; (b) dependent variables included observed social interactions between adolescents with ASD and typical peers; (c) involved adolescents, ages 13-21; (d) involved at least some students with a diagnosis of ASD; (e) employed a single-subject designs with at least three baseline and intervention data points via detailed graphs; and (f) published in peer-reviewed English language journals between 1984 and 2015.

IV. PMI FOR ADOLESCENTS WITH ID AND ASD

A majority of the PMI social-communication literature with adolescents has focused on students with a diagnosis of Intellectual Disabilities (ID), or ID plus other diagnoses such as ASD. The current review identified eight investigations that included one or more participants with ID who also had an ASD diagnosis. For example, in an early study [10], three youths, ages 17-20 years, each with a dual diagnosis of ID and ASD, were taught how to engage in social interactions with typical peer partners during break time using three objects (i.e., hand-held video game, Sony Walkman FM radio, pack of chewing gum). Training scripts were developed for both focus students and typical peers. Both trained and untrained typical peers served as interaction partners. Using a single-subject multiple baseline design across objects, results indicated the focus students' initiations and duration of social interactions with typical peers and other students increased over baseline levels following intervention. It should be noted that the intervention was a multicomponent package that included peer interaction partners, training in use of objects, and social skills training using scripts.

In another early investigation of PMI with adolescents [6], a social network intervention was implemented for two 13-year-old males (one with ASD, one with ID and severe language delay). Researchers and teachers formed networks of four or five typical peers for each focus student. These peer networks were taught specific strategies to increase opportunities for social interaction with the focus students during transition times and lunch. In addition, the peers participated in the design and implementation of the social skills interventions, and used self-monitoring to track the quantity and quality of their social interactions with the focus students. Outcomes were evaluated using a single-subject multiple baseline design across the two students. Results indicated that the PMI plus self-monitoring increased the frequency, opportunities, and appropriateness of social interactions over baseline levels for these focus students. In addition, all students and typical peers reported the development of friendships and high satisfaction ratings following the intervention.

In another example of PMI research focused predominately on adolescents with ID [7], ten peers were taught to use a self-instructional strategy to teach conversational skills to four female students with ID (one with an additional diagnosis of ASD), ages 17-21 years, in social interaction settings (lunchroom, activity area of classroom, and multipurpose small-group room). Outcomes were evaluated using a single-subject multiple baseline design across the four focus students. Findings indicated that peers were able to learn and use the teaching strategy, and that peer training was associated with increases in students' conversational skills/interactions (e.g., initiations, responding, eye gaze, etc.) with both familiar and unfamiliar peers with and without disabilities in a generalization setting. However, unlike [6] in which peer networks and true friendships were developed as a result of PMI, here social involvement was limited to short conversation periods and a structure interaction format. Similar results were obtained in a subsequent systematic replication [8] with eight new students.

Another study [9] evaluated a PMI strategy in which thirteen peer trainers, all juniors or seniors, ages 17-18 years, successfully taught five students with ID (one also had ASD), ages 16-18 years, how to self-prompt to use a communication book. Drawings in the books represented conversational "openers" such as, "What kind of music do you like?" As with other studies, intervention outcomes were evaluated using a single-subject multiple baseline design across the five participants. Results indicated all focus students increased their topics discussed, initiations, responding, and self-prompting across familiar and unfamiliar peers during training and maintenance conditions. A systematic replication [12] with five students with ID (three also had ASD), ages 16-20 years, found that communication book use, combined with providing the opportunity to interact, was associated with increases in conversational initiations and responses of the focus students and their typical peer partners. No adult prompting or instructional feedback was provided during the student interactions.

The next study [26] evaluated the impact of altering the number of peers in a PMI on the academic and social interaction behaviors of three students with ID (two also had ASD), ages 12 to 17 years. In addition to targeting academics, peers were also taught strategies to increase focus student participation and promote communication between the student and other students in the class. Using single-subject counterbalanced reversal designs, overall results indicated that higher levels of social interaction were observed when students with disabilities worked with two peers as compared with one peer.

More recently [21], two typically developing peers were taught to prompt and provide feedback to a 15-year-old middle school female student with diagnoses of ID, ASD, and speech impairment during craft activities. Researchers also taught the focus student how to use visual scripts (words and pictures) to ask questions, give praise, comment, and request help. A single-subject multiple baseline design across responses was used to evaluate the results. All target behaviors increased over baseline levels during PMI plus visual scripts, and these levels were maintained at follow-up; however, behavior gains did not generalize to use with an untrained peer.

Finally, a recent unpublished pilot study [27] (not included in the formal review) taught typical peers strategies to support sustained conversation with three focus students with ASD

and ID, ages 14-15 years, who were low initiators and poor conversationalists. The facilitative strategies, developed based on previous research with young children with ASD [19] and baseline observations of typical peers, included (a) show interest in the student with ASD and follow his/her lead, (b) gain the student's attention before talking, (c) share information and ask open ended questions, (d) repeat, clarify, or explain in another way if the student does not understand, and (e) redirect repetitive conversation. In addition, focus students were taught to use a visual support card that listed possible topics of conversation. Using a single-subject multiple baseline design across participants, findings indicated that the PMI strategies resulted in longer and more sustained conversations between focus students and their peers as compared with baseline levels. In addition, overall responsiveness by the students with ASD improved, but little improvement was noted in the students' specific conversational skills, suggesting a more intensive intervention may be required to have a long-term impact on the conversational abilities of students with ASD and ID.

V. PMI FOR ADOLESCENTS WITH ASD

Only two social-communication PMI investigations were found that targeted adolescents with a sole diagnosis of ASD. The first study [11] taught four middle school students with ASD, ages 10-13 years, and a group of similar-age typical peers to use and monitor social skills while playing games. The intervention involved direct instruction of specific social skills (i.e., requesting, commenting, and sharing) and self- and peer-monitoring of each of the skills taught. A single-subject counterbalanced reversal design was used to evaluate peer mediation of skill use during game play, and to compare the effects of self- and peer-monitoring conditions for enhancing skill use. Results indicated that teaching social skills using PMI plus self-monitoring and reinforcement effectively increased the initiations of students with ASD to their peers during game play. Little difference was noted between self- and peer-monitoring conditions, and there was a lack of generalization to the lunchroom setting for two of the four students.

The other study [22] used a single-subject multiple treatments design (ABCDCD) to compare the generalization effects of two PMIs on skills acquired by focus students in a school-based social competence intervention. In this study, three males, ages 12 and 13 years, with ASD and social skills concerns sat at the same lunch table with a typical peer. During peer training, researchers provided peers with background information on specific social competence deficits of individuals with ASD, and strategies and supports to successfully implement the PMI. The focus students with ASD participated in the social competence training program that used a cognitive behavioral framework and was created specifically for high-functioning adolescents. Results indicated that the addition of PMI enhanced generalized gains in social interaction beyond those of the school-based social competence intervention.

VI. SUMMARY AND CONCLUSION

Relatively few studies have evaluated PMI strategies to promote social-communication for middle and high school students with ASD. Only ten studies involving adolescents were found and eight of these primarily involved students with ID, with only two studies focused on students with a sole diagnosis of ASD. Given the heightened social-communication challenges associated with adolescents with ASD, it is imperative that effective interventions be identified for these students. Since utilizing typical peers as interventionists automatically increases the availability of effective partners for social interaction [20], PMI would appear to be a logical intervention of choice. Results of the ten studies reviewed provide a preliminary indication that PMI can effectively encourage social-communication skills and interactions of these students. Several critical intervention features were associated with positive student outcomes. First, most researchers included a component that provided accurate and relevant information about the strengths and needs of individuals with ASD. This may be particularly important for peers who have had limited prior contact with students with ASD, to avoid misinterpretations of focus student behavior. Second, several of the studies taught the peers specific conversational strategies to initiate and sustain conversation, and facilitate focus students' social participation. This may help to strengthen the ability of peers to be effective conversational partners. Finally, many studies emphasized the need for ongoing support for peers in their efforts to facilitate social interactions with students with ASD, to help reinforce and maintain these peer efforts.

While encouraging, there are several recommendations for future PMI research with adolescents with ASD. First, in many previous studies, social involvement was limited to short interaction periods and a structured interaction format. To encourage more naturalistic social interactions and even long-lasting friendships, future studies should evaluate the use of PMI strategies that involve a looser format and are delivered in more authentic social environments, to promote more naturalistic social interactions. This is admittedly challenging at the secondary level where the primary emphasis is on academics and free time for students is limited, but may require creating new informal social opportunities such as creation of social clubs, new lunchtime arrangements, or after school activities. Second, future studies should systematically evaluate both generalization and social validity outcomes. While it appears that PMI may produce some generalized effects and positive participant perceptions, results of the current studies were limited and somewhat mixed, so should be explored further. Third, future research should evaluate more thoroughly variations in PMI and the effects of adding other intervention components such as visual supports or self-monitoring. Since the PMI literature for adolescents is in its infancy, more information is needed regarding the optimal combination of intervention strategies for advancing this important area of intervention research. Finally, all studies reviewed involved small sample sizes and single-subject research designs. As information is accumulated regarding

optimal PMI strategies, effectiveness should be demonstrated in larger-scale randomized control trials.

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