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## A systematic review of peer-mediated interventions for children with autism spectrum disorder



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### ABSTRACT

**Background:** Peer mediated intervention (PMI) is a promising practice used to increase social skills in children with autism spectrum disorder (ASD). PMIs engage typically developing peers as social models to improve social initiations, responses, and interactions. **Method:** The current study is a systematic review examining PMIs for children and adolescents with ASD conducted using group designs. Five studies met the pre-specified review inclusion criteria: four randomized controlled trials and one pre- and post-test design.

**Results:** Four of the studies were conducted in school settings, whereas one study was conducted in a camp setting. The studies all reported that participants improved in social skills (e.g., social initiations, social responses, social communication) post intervention. Additionally, sustainment, generalization, and fidelity of implementation were examined. **Conclusion:** PMI is a promising approach to address social skills in children with ASD, and this approach can be conducted in meaningful real-world contexts, such as schools. Limitations of the studies as well as future directions are discussed.

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### Contents

1. Introduction	2
2. Methods	4
2.1. Search strategy	4
2.1.1. Inclusion and Exclusion Criteria	4
2.2. Rating method quality	4
3. Results	4
3.1. Methodological quality	4
3.2. Participants receiving intervention	4
3.3. Peer training	6
3.4. Social outcomes	6
3.5. Implementation fidelity	7
3.6. Generalization and sustainment	7
3.7. Evidence-based practice	7
4. Discussion	7

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5. Conclusion .....	9
Acknowledgments .....	9
References .....	9

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## 1. Introduction

Social impairment is a debilitating core deficit that affects children with autism spectrum disorder (ASD; [American Psychiatric Association \(APA\), 2013](#)). Difficulty reading social cues as well as engaging in interpersonal communication may preclude children with ASD from successfully interacting with their peers, particularly in the school setting ([Bauminger, Solomon, & Rogers, 2010](#)). Many studies of school-aged children with ASD have shown a disrupted pattern of social engagement, where children with ASD have fewer reciprocal friendships ([Bauminger & Kasari, 2000](#); [Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008](#); [Bauminger, Solomon, Aviezer, Heung, Brown et al., 2008](#); [Chamberlain, Kasari, & Rotheram-Fuller, 2007](#)), are unengaged with their peers on the playground ([Frankel, Goropse, Chang, & Sugar, 2011](#); [Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011](#); [Macintosh & Dissanayake, 2006](#); [Schupp, Simon, & Corbett, 2013](#)), and more peripherally included in smaller social networks ([Chamberlain et al., 2007](#); [Locke, Kasari, Rotheram-Fuller, Kretzmann, & Jacobs, 2013](#); [Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010](#)). To address these concerns, many interventions have been developed to promote and facilitate social interactions.

Research evaluating social skills interventions in children and adolescents with ASD has highlighted peer-mediated interventions (PMI) as one of two most promising intervention methodologies to improve social skills ([Bass & Mulick, 2007](#); [Chan et al., 2009](#); [McConnell, 2002](#); [Reichow & Volkmar, 2010](#); [Rogers, 2000](#)). PMIs comprise training typically developing peers (e.g., classmates) on behavioral and social strategies to engage children with ASD ([Bellini, Peters, Benner, & Hopf, 2007](#); [Chan et al., 2009](#); [Kasari, Rotheram-Fuller, Locke & Gulsrud, 2012](#); [Rao, Beidel, & Murray, 2008](#)). PMIs can be beneficial for children and adolescents with ASD for several reasons. First, peers can model appropriate social behaviors. Second, peers often are readily accessible in school settings to act as intervention agents, and third, children with ASD can use peers to practice their newly acquired social skills ([Chan et al., 2009](#)). Broadly, PMIs have shown improvements in social network inclusion (i.e., number of social connections, peer acceptance, and classroom connectedness), non-verbal social skills (e.g., eye contact, joint attention), play skills (e.g., turn-taking), reciprocal social-communication skills (e.g., conversations, initiations, responses) as well as greater social interaction and increased friendships for children and adolescents with ASD ([Bass & Mulick, 2007](#); [Carter & Kennedy, 2006](#); [Jung, Sainato, & Davis, 2008](#); [Kamps, Potucek, Lopez, Kravits, & Kemmerer, 1997](#); [Kasari et al., 2012](#); [Laushey & Heflin, 2000](#); [Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008](#); [Roeyers, 1996](#); [Strain & Kohler, 1995](#)).

There have been a number of reviews of social skills interventions (see [Bellini et al., 2007](#); [Cappadocia & Weiss, 2011](#); [Chan et al., 2009](#); [Ferraioli & Harris, 2011](#); [Kasari & Patterson, 2012](#); [Rao et al., 2008](#); [Reichow, Steiner, & Volkmar, 2012](#); [Rogers, 2000](#); [Wang, Cui, & Parrila, 2011](#); [Watkins et al., 2015](#); [White, Koenig, & Scahill, 2007](#); [Zhang & Wheeler, 2011](#)). Of those, few have focused on PMIs (see [Chan et al., 2009](#); [Ferraioli & Harris, 2011](#); [Wang et al., 2011](#); [Watkins et al., 2015](#); [Zhang & Wheeler, 2011](#)). Single-subject design studies in PMIs have been more extensively studied. Two *meta*-analyses have been conducted examining the efficacy of PMIs ([Wang et al., 2011](#); [Zhang & Wheeler, 2011](#)). Both of these studies exclusively examined single-subject designs and found PMIs to be highly effective for children with ASD. [Chan et al. \(2009\)](#) were more comprehensive in their review and summarized all PMI studies from inception to 2009. In their review, peer training methodology and specific intervention components used in 42 PMI studies were discussed. The authors highlighted the main methods of peer training used in each study, such as reinforcement, verbal explanation, modeling, group discussion, and on-going feedback. The review suggests that PMIs for children with ASD may be quite different from study to study, particularly in the targeted skill sets (i.e., academic skills, disruptive behaviors, social skills). While improving different skill sets are essential for the overall quality of life for individuals with ASD, it is with utmost importance that PMIs specifically targeting social skills be further examined, as social impairment is a core deficit affecting individuals with ASD ([APA, 2013](#)). More recently, [Watkins et al. \(2015\)](#) extended Chan and colleagues' work and summarized 14 additional PMI studies that were published between 2008 through 2014. In their review, [Watkins et al. \(2015\)](#) also focused on the intervention characteristics and strategies. They examined the different strategies used in PMIs and discussed how PMIs may be more appropriate for children with ASD who exhibit different characteristics and deficits. [Watkins et al. \(2015\)](#) highlighted various PMI strategies that included initiations by peers, proximity, prompting and reinforcing initiations.

All of the reviews suggest that PMIs are effective in improving social skills in children with ASD. However, only a small number of group designs were included in these reviews, and these reviews primarily included single-subject designs and studies that targeted ancillary skills (e.g., academic achievement, maladaptive behaviors) associated with ASD rather than core social skills deficits. Since PMIs are one of the most promising interventions for children with ASD, we need to better understand for whom PMIs are most effective by examining studies that have rigorously tested PMIs using group designs. Single subject design studies have provided promising results in the effectiveness of PMIs. However, one of the disadvantages of single subject designs is the generalizability of the results to groups of individuals, particularly one that is as heterogeneous as children with ASD. The current review will expand the literature on PMIs by focusing on studies that used experimental group designs for all school age children (preschool to high school) with ASD that targeted social skills. The current review will use [Reichow, Volkmar, and Cicchetti's \(2008\)](#) evaluation protocol to rate the quality of the PMIs using

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