Social Skills Interventions for Children and Adolescents with Autism Spectrum Disorder: An Analysis of Strengths and Weaknesses

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Children and adolescents with Autism Spectrum Disorder (ASD) frequently experience significant social skills deficits. These deficits are often related to communication, resulting in frustration and lack of ability to express distinct thoughts and needs. Past research has found that children with ASD who do not receive effective intervention treatment for these deficits often maintain poor social outcomes as young adults and display an increased number of maladaptive behaviors throughout development. In fact, several maladaptive behaviors associated with ASD, such as aggression, hyperactivity, non-compliance, and self-injurious behavior may emerge because of inadequate communication skills (DSM-5; American Psychiatric Association, 2013).

Along with the forementioned problems, social deficits in children and adolescents with ASD have been shown to increase the likelihood of depression and anxiety, two conditions already highly comorbid with ASD (Kirsch et al., 2020). For children and adolescents with ASD, depression and anxiety can exacerbate maladaptive behaviors and worsen life satisfaction outcomes (Kirsch et al., 2020). Behavioral interventions targeting social skills have been found to be an effective agent in improving social outcomes and decreasing the consequences associated with social deficits. There is a wide range of social skill interventions available for clinicians and families to utilize.

The aim of the current review is to observe the strengths and weaknesses of different social interventions represented in previous research. The information deducted from the current analysis will serve to assist families in choosing the best intervention for their situation. In addition, any procedural weaknesses observed in the previous research will allow future researchers to improve and expand the field. A variety of clinician, peer, and parent-mediated

interventions utilizing various social interventions were observed, allowing for a thorough analysis with consideration of the mediating variable.

Clinician Mediated Interventions

The current research observed four instances of previous research regarding social interventions for children and adolescents with ASD delivered by a professional clinician. The researchers tested different interventions such as positive stimulus pairing (PSP), the FRIEND playground program, and PEERS.

PSP aims to increase social approach, an important variable in social outcomes for children with ASD. The intervention does this by pairing an educator with a preferred activity (National Autism Center, 2009). For example, an educator may plan periodic dance breaks where they listen to a student's favorite song. This favorite song then becomes associated with the educator, theoretically resulting in increased social approach and reduced frequency of escape behaviors.

Shillingsburg et al. (2014) observed whether pairing educators with children's preferred activities would result in increased approaches to the learning environment and less frequent escape behaviors among young children with ASD. The PSP intervention drastically increased the participants' social approach frequency with educators during DTT. Social avoidance behaviors were also affected, with elopement dropping to a 0% occurrence rate for both participants after only three pairing sessions. These results suggest that incorporating the pairing intervention into clinician delivered programs will predict better social outcomes.

The FRIEND intervention aims to improve and increase social interactions of children with ASD. The intervention was designed with flexibility in mind, allowing the mediator to utilize intervention techniques from different areas of ABA, such as positive behavior supports,

PRT, priming, and reinforcement procedures. This way, the mediator may tailor the intervention directly to the child's choices and pull upon different techniques when needed. Due to the spectrum nature of autism disorders, this flexibility may be more beneficial than interventions with less broad methods of implementation (Dollin & Ober-Reynolds, 2004).

Vincent et al. (2017) aimed to observe whether the FRIEND playground program could serve as an effective support in increasing social engagement and social initiations of students with ASD and TD peers. A significant increase in participants' with ASD time spent engaged with typically developing (TD) peers was observed. The participants also showed a slight increase in rate of initiations.

Adolescence is a developmental period that revolves around social aspects, such as peer relationships and other social affiliations (Mitchell et al. 2010). Because of this, social deficits can make this a very challenging time for adolescents with ASD, leading to increased feelings of loneliness and social anxiety (Bauminger & Kasari, 2000). The PEERS program is commonly used to teach adolescents with ASD how to handle different social situations. The intervention method involves teaching social skills in a group setting**,** allowing for a more interactive experience. The PEERS program commonly consists of didactic lessons followed by roleplay opportunities, behavioral rehearsals, and homework tasks to ensure generalization. (Laugeson et al. 2009).

Schohl et al. (2013) observed whether the PEERS intervention would significantly reduce social anxiety, significantly decrease ASD symptom reports, and significantly decrease problem behaviors associated with social skill deficits in adolescents with ASD. The PEERS intervention significantly increased social skill knowledge and frequency of participant social interactions. A significant decrease in social anxiety reports was also observed.

Interestingly, past research has suggested that girls with ASD have more social impairments than boys (Bargiela et al., 2016). This may be attributed to the implication that girls may present ASD symptoms differently than boys (Kreiser & White, 2014). Specifically, girls with ASD may internalize symptoms more often, while boys tend to externalize symptoms.

McVey et al. (2017) aimed to expand upon the findings of Schohl et al. (2013) by observing potential differences in social behavior outcomes based on gender in a group of adolescents with ASD participating in the PEERS intervention. The researchers found no significant difference regarding social improvements based on gender for adolescents with ASD. These null findings do not discredit past research, which points to females with ASD differing from males with ASD in symptom expression (Dean, 2014). Instead, these findings speak to the efficacy of the PEERS social intervention, suggesting that it is equally beneficial for all adolescents with ASD, regardless of gender.

Strengths and Weaknesses

A number of strengths and weaknesses were present in each of the observed studies. Three out of the four observed studies displayed severe flaws pertaining to their participant samples. Vincent et al. (2017) only included seven participants, while Shillingsburg et al. (2014) utilized a miniscule sample of only two participants. Further worsening this lack of representation, both participants were male, and one participant was nonverbal. Half of the sample was nonverbal, yet this was not mentioned as a potential limitation that could have affected results. Due to the social communication disadvantages associated with being nonverbal, this factor may have significantly influenced the generalizability of the results. (DSM-5; American Psychiatric Association, 2013).

Although McVey et al. (2017) utilized a respectable sample of 177 participants, only twenty-seven were female. For research specifically observing the outcomes of female adolescents with ASD, the sample only included 27 participants. Lastly, while Schohl et al. (2013) utilized a relatively acceptable sample size of 58 adolescents, there was a severe lack of diversity. The sample was 81% male and 90% Caucasian, eliminating any significant representation of racial and gender minorities. This underrepresentation makes it difficult to generalize the results to a larger, more diverse population.

Additionally, Vincent et al. (2017), Shillingsburg et al. (2014), McVey et al. (2017), and Schohl et al. (2013) all failed to test for generalization of skills. This is a critical weakness as generalization represents the longevity of the improved social outcomes. A temporary solution is not acceptable as these social deficits continue to affect individuals with ASD throughout their entire lives if left unattended. For this reason, testing for generalization of skills should be a mandatory component of any intervention research.

Although these studies garnered multiple weaknesses, they also held significant strengths. Schohl et al. (2013) found that the PEERS intervention not only improved social skills in adolescents with ASD, but also significantly improved social interaction frequency; specifically, the number of social invitations the adolescent received from TD peers. This is a highly relevant finding due to the importance of social acceptance to adolescents. McVey et al.'s (2017) findings strengthened the value of the PEERS intervention by revealing no difference in effectiveness based on gender, suggesting that the PEERS intervention is equally effective for both boys and girls with ASD. That is what makes these findings relevant and crucial to ensuring effective care is being given to adolescent clients, regardless of gender.

Shillingsburg et al. (2014) presented a useful tool, the positive stimulus pairing procedure, which pairs an educator with a preferred activity in order to improve social approach. Clinicians can utilize this technique alongside any intervention to improve the effectiveness of said intervention. An easily implemented strategy that improves social approach and reduces escape behaviors will likely be a valuable tool that clinicians could use to improve their clients' social outcomes.

Vincent et al. (2017) performed the most methodologically rigorous research, enacting their intervention over the course of an entire year. This increased time frame allowed for a more realistic representation of the intervention's effectiveness. Additionally, expanding our knowledge of the under-researched FRIEND playground program was a strength of their study. Because the FRIEND program was exceptionally flexible, encouraging the mediator to tailor the intervention directly to the child's choices and utilize different ABA techniques when needed. Autism disorders exist on a spectrum; therefore, this flexibility may be more effective than interventions with more rigid methods of implementation. Future research could compare the FRIEND program to more mainstream interventions, such as PRT or PEERS.

Peer Mediated Interventions

Although there are clear benefits of clinician-implemented interventions, one of the main limitations is a lack of generalization support, which can be addressed by the use of peer-mediated interventions (PMI). A PMI is a treatment method for individuals with ASD in which a similarly aged peer is trained in elements of behavioral intervention to address a particular outcome. Past research has suggested that PMIs can lead to increased generalization of skills. This is important as the ability to generalize skills across different contexts is crucial for long-term outcomes. The following studies tested the efficacy of different PMIs, such as Pivotal

Response Training (PRT), Peer Network Recess Intervention (PNRI), and social practice through roleplay.

PRT is a naturalistic intervention used to support and improve social outcomes in individuals with ASD. PRT focuses on four pivotal areas of development: motivation, response to multiple cues, self-management, and social initiations (Pierce et al., 1997). PRT is predictable by design, presenting structured social encounters for children who would otherwise practice avoidance in typically less structured environments, such as the playground (Harrower & Dunlap, 2001).

Brock et al. (2017) observed the effects of peer implemented PRT on peer interactions and quality of play during recess. The researchers observed a significant increase in the number of social interactions initiated by both TD students and students with ASD. However, results did not reveal a significant effect on quality of play.

Harper et al. (2017) observed what effects peer implemented PRT would have on social play initiations, appropriate turn taking, and social communication in children with ASD during recess. The researchers observed a significant increase in social interactions and successful turn taking behaviors. Generalization of skills was also observed, with both social interactions and successful turn taking behaviors maintaining significant improvements.

Similarly, McFadden et al. (2014) observed the effects of a PNRI on reciprocal communication outcomes during recess. A PNRI is a variation of PRT in which a network of peer-mediators is utilized to prompt social communicative opportunities between children with ASD and their TD peers during recess. However, unlike PRT, PNRI places a specific emphasis on durations of interactions, communicative responsiveness, and frequency of communicative

behaviors (Morrison et al., 2001). The researchers found PNRI to significantly increase social communication behaviors, such as initiations and responses.

While these results clearly speak to the structural benefits of PRT and PRT adapted interventions, sometimes a more flexible intervention is necessary. Corbett et al. (2013) observed the effects of social practice, or roleplaying positive social interactions, by utilizing theatre arts on social perception skills and social anxiety reduction. The researchers found a significant increase in social involvement and improvement in social perception, specifically facial expression identification. Social responsiveness also showed a significant improvement, as well as social awareness and cognition scores. Participant cortisol levels were also significantly reduced, suggesting participant stress reduction occurred over course of the theatre arts intervention.

Strengths and Weaknesses

A number of weaknesses were present in each of the observed studies, such as small sample sizes that lacked diversity. Both Brock et al. (2017) and Corbett et al. (2013) only included 11 participants, and both samples were primarily boys. Harper et al. (2007) utilized a miniscule sample of only two participants, both of which were boys. McFadden et al. (2014) only included four participants, all of whom were Caucasian boys. This severe lack of diversity across each unit of research makes their results difficult to be generalized to a larger population of children and adolescents with ASD. Additionally, generalization of the learned social skills across multiple environments and individuals was not observed, further reducing result validity.

Among these weaknesses, a number of strengths were also present in each of the observed studies. Brock et al. (2017) included a student interview section inquiring upon their experience participating in the intervention. As their sample size and lack of diversity severely

harmed the generalizability of their results, the most valuable product of the study was the interview portion. Individual interviews with participants included remarks about their personal experiences, providing potentially valuable perspectives that hold strong reliability and validity that the researchers can learn from. The majority of both TD students, and students with ASD, reported positive outcomes from the PRT implementation and advocated for doing it again. This interview portion provided a rare insight into how the participants felt about an intervention, speaking not only to its effectiveness, but to its enjoyability. Enjoyability could be an important factor as it may reduce avoidance behaviors and allow for more effective learning as the student will be more willing to participate.

Corbett et al. (2013) provided excellent training for their peer-mediators. Therefore, the study's greatest strength was the care they placed in fidelity and effective training. In an experiment, fidelity describes the accuracy of a delivered intervention in regard to the intended procedure (Carroll et al., 2007). In other words, fidelity refers to whether an intervention was implemented as intended, or if the mediator did not follow the written procedures. This is crucial as an intervention cannot be fairly observed if it is not implemented as intended.

Corbett et al. (2013) did not merely mention what applied to their intervention, but instead covered the broad fundamentals of intervention techniques, as well as general knowledge of ASD. Additionally, the creative intervention medium used during the research was a strength of this study. The creative and enjoyable implementation of the intervention is what sets it apart and makes it such a great option; not only does the intervention effectively teach social skills, but the intervention itself acted as a reinforcing agent due to it being a fun activity.

McFadden et al.'s (2014) unique implementation of PMI involving an adult facilitator and frequent intervention coaching breaks was their strongest contribution. One of the main

weaknesses associated with PMI is intervention fidelity. It is difficult for children to successfully implement an intervention exactly how it is intended to be implemented. However, this approach bolsters that weakness by introducing the variable of the professional facilitator and frequency coaching breaks. This is important as it supports fidelity and allows a professional to actively control the intervention procedure. Since PMI have been suggested to be arguably the most effective form of social intervention for generalizability, a method such as this that solves crucial weaknesses is incredibly valuable.

Harper et al. (2007) did not harbor many strengths, although it is worth noting that at the very least the training provided to the TD peer mediators may have provided beneficial awareness regarding interacting with their fellow peers with ASD. This is important as children with ASD are often ignored by their TD peers. This could be due to TD children not understanding how to effectively interact with children with ASD.

Parent Mediated Interventions

The current research progressed to explore four instances of previous research regarding social interventions for children and adolescents with ASD delivered by parent mediators. Parent-implemented interventions is an area of research that has gained considerable interest in recent years, as the prospect of parents being able to deliver effective interventions holds multiple benefits, such as increased intervention opportunities across multiple settings. The following studies observe the effectiveness of parent mediated interventions such as the Improving Parents as Communication Teachers (ImPACT) program, stimulus-stimulus pairing (SSP), and the complementary communication intervention (CCI).

Project ImPACT aims to provide parents with a variety of techniques to improve their childrens' social language, engagement, play, and imitation. The intervention, developed by

Brooke Ingersoll, follows on a training manual written by Ingersoll, *Teaching Social Communication to Children with Autism* (Ingersoll & Wainer, 2013).

Ingersoll et al. (2013) observed the effects of the ImPACT program on child language outcomes. The ability for a child to verbally communicate their feelings may contribute to positive social outcomes, making this an important variable to observe. Results revealed an increasing trend in intervention fidelity the longer parents were exposed to ImPACT training, with fidelity peaking around week 8. The children with ASD showed mixed improvements in language outcomes, with most participants showing a significant increase from baseline scores. A significant relationship between the intervention fidelity and degree of language improvement was observed, such that the greater the intervention fidelity was, the more language improvements occurred.

To further expand our understanding of ImPACT, Ingersoll et al. (2016) compared the effectiveness of therapist-assisted versus self-directed delivery of ImPACT Online (an online version of the ImPACT training program). The results revealed that parents in both the therapist-assisted and self-directed groups showed a significant improvement in intervention fidelity, although parents in the therapist-assisted version reached significantly higher fidelity than parents in the self-directed group. Also, the children in the self-directed group failed to generalize their skills during the 3-month post-treatment observation while those in the therapist-assisted group did generalize their skills.

Flexibility is an important variable for parents living busy lives, so an intervention that supports that variable may be highly valuable. SSP aims to improve social outcomes in children with ASD by utilizing the fundamentals of Pavlov's classical conditioning (Sundberg et al., 1996). The intervention is run by providing positive reinforcement for successful communication

attempts. The verbalizations that mediators reinforce depend entirely upon the goals for the child, allowing for great flexibility and the option to customize the intervention to each child's goals.

Barry et al. (2018) aimed to observe the effectiveness of the SSP intervention on improving social communication outcomes when mediated by a parent. The results revealed significant increases in the participants' social communication frequency. These results confirm that a parent mediated version of SSP can be effective in improving social communication outcomes in children with ASD.

Sometimes training may be completely unavailable to parents. In that case, an intervention such as the CCI is an excellent option as it is simply a naturalistic intervention that relies on strategic responses from the mediator (Yoder & Warren, 2001). An example of this intervention would be a child saying, "mommy shoe?", and a mother responding, "Yes. That is mommy's shoe. It is too big for you". The mother interprets the question being asked and answers it naturally while providing additional information.

Aldred et al. (2004) aimed to observe whether a parent mediated CCI would improve social communication skills in children with ASD and increase the duration of positive interactions between the parent and child. The findings revealed a significant increase in social communication and duration of interactions between the parent and child.

Strengths and Weaknesses

A number of familiar weaknesses were present in each of the observed studies, such as small sample sizes and a lack of diversity. Ingersoll et al. (2013) only utilized a sample of eight participants. Ingersoll et al. (2016) harbored a decent sample of 28 participants, but their sample lacked diversity. The therapist-assisted group had a larger number of minority child participants

(36%) than the self-directed group (8%). The results blatantly favored the therapist-assisted group in terms of effectiveness; thus, it is worthwhile to consider the effects that racial/ethnic backgrounds could have on the measurements.

Barry et al. (2018) hosted an extremely limited sample of only two participants, both of whom were boys. As noted in previous weakness examinations, this severe of a lack of diversity makes result validity highly compromised. Additionally, the researchers claimed this study to be a parent mediated intervention, yet they included a researcher in each session as a resource available to assist the parents. The amount of assistance provided is not described, further weakening result validity and generalizability of the findings as this is effectively a confounding variable. Lastly, generalization of skills was not observed.

Aldred et al. (2004) included an acceptable sample of 28 children with ASD, however a lack of diversity was still present in the sample. The treatment group consisted of 13 boys and only 1 girl. The control group respectively consisted of 12 boys and only 2 girls. This lack of gender diversity may have influenced results as past research suggests that children may externalize ASD symptoms, and symptoms of other common comorbidities, differently based on their gender (Kreiser & White, 2014). Lastly, generalization of skills was not observed once again.

Despite these weaknesses, a number of strengths were also present in each of the observed studies that provide valuable implications. Ingersoll et al. (2013) provided valuable insight into ImPACT, which their research suggests is an effective form of parent mediator training for social interventions. Their study's strengths included the training materials' effectiveness in helping parents improve their children's social outcomes, and the testing for fidelity and generalization of skills. These two aspects provide a very strong foundation of

research that families with ASD can rely on when sorting through intervention options. Ingersoll et al. (2016) replicated these strengths by testing them in relation to an online delivery of the ImPACT training. Again, fidelity and generalization were two of the primary focuses, strengthening the validity of their results. The insight provided by this study into the telehealth avenue of care will surely save many families time and guesswork concerning which intervention format to invest in.

Barry et al. (2018) was diligent in reducing potential confounding variables through the use of a control group and by monitoring additional interventions the participants were exposed to. Unfortunately, this strength does not fix their damaged result validity due to their miniscule sample of two participants. These results are the weakest of the four observed studies as it is difficult to deduce any generalizability from the findings.

Aldred et al. (2004) also included a control group, strengthening the validity of their results. The main strength of their study, however, was the simplicity of the intervention being observed. The naturalistic and conversational nature of the CCI makes it highly viable for any parent to casually implement into their family's everyday routine. Due to the importance of consistency in effective interventions, this makes CCI a powerful parent mediated intervention. This intervention serves as an encouraging option for parents who wish to assist in their children's care, but do not have time for intensive training, as the intervention workshop for CCI only took one day.

Conclusion

The social deficits associated with ASD may obstruct the development and maintenance of essential social skills. These deficits often lead to consistent rejection and may result in eventual social withdrawal, further hindering social initiation and any potential for quality

friendships (Bauminger et al., 2010). It has been suggested that this social withdrawal can also lead to the development of depression and anxiety in children and adolescents with ASD (Mazurek and Kanne, 2010; Whitehouse et al., 2009). For these reasons, access to effective social interventions is an important factor that may serve to prevent a plethora of various maladaptive outcomes for children and adolescents with ASD, including the emergence of comorbidities such as depression and anxiety.

Schiltz et al. (2017) examined the effectiveness of the PEERS intervention on reducing depressive symptoms in adolescents with ASD. Their results revealed a significant reduction in depressive symptoms after an effective implementation of the social intervention. Lei et al. (2017) examined the effectiveness of the PRT intervention on reducing anxiety symptoms in children with ASD. Their findings revealed a significant reduction in anxiety symptoms after the implementation of PRT. These results suggest the importance of a successful intervention and its potential impacts on an individual with ASD's life. These interventions do not just predict improved social outcomes, but may predict improvements in anxiety and depression, two debilitating comorbidities that are common among children and adolescents with ASD (Mazurek and Kanne, 2010; Whitehouse et al., 2009).

The overarching question is this: what is the most effective method of intervention, and who can best mediate said intervention? The vexatious answer is this: as deducted from the observed research, no method of intervention is significantly better than another, and no mediator is ultimately superior. Like ASD, the effectiveness of interventions can be described as a spectrum. One intervention may appeal more to a particular child than another. For example, the highly structured procedure of PRT will likely appeal to a child that practices severe social withdrawal. Alternatively, the highly naturalistic procedure of CMI will appeal to a child that

practices escape due to the unstructured implementation. The same is true, for the most part, when accounting for superiority in mediators. However, some mediators do have clear advantages.

As deducted from the examined research, children and adolescents who participate in parent mediated interventions or peer mediated interventions seem to generalize and retain their newly learned skills more consistently. Past research suggests that this is likely due to the fact that the children have increased exposure to their parents and peers, allowing for more maintenance opportunities than the child would find with a clinician (Luiselli et al., 2000). This is a highly relevant and important detail for families to consider when choosing a mediator for their child or adolescent's care.

The importance of generalization of skills cannot be understated as it speaks to the longevity of the learned behaviors. However, one of the most common limitations present across every observed study was a lack of testing for generalization of skills. This in conjunction with the other most common limitation, a very small and non-diverse sample, made nearly half of the observed studies' results weak in validity. Future research should aim to include generalization testing and should also focus on gathering larger and more diverse samples. The presence of a small and non-diverse sample seems to be a significantly common weakness across the vast majority of ASD intervention research. I could not find a single instance of research that met all of the following criteria: more than 30 participants, gender diversity, and racial diversity. Clinicians, families, and the empirical basis of research would collectively benefit from improvements in these areas. It is worth noting that these weaknesses are not by chance. As of 2012, around the time that most of these studies were conducted, ASD was found to be 20%

more prevalent in white children than Hispanic and black children; and today, ASD is four times more prevalent in boys than girls (Baio et al., 2014).

As stated earlier, at the moment there is not a single intervention or mediating force that is universally superior to another. Interventions will benefit individuals differently, but most interventions seem to provide significant improvements in the short-term. However, once we have more research on generalization of skills, we can truly begin to understand the long-term differences between interventions and the mediating element. We can then begin to compare the mediating agents more clearly and move towards perfecting intervention procedures to produce lasting improvements in social outcomes for children and adolescents with ASD.

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