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The Effects of Therapy and Parental Involvement on Social Skill Development in Children with Autism Spectrum Disorder

Zaryab Hameed
SU92-MSCPW-F23-039@superior.edu.pk
MS Clinical Psychology Scholar,
Department of Clinical Psychology, The Superior University, Lahore

Fatima
fatimamustafagcu@gmail.com
Research Supervisor, Department of Clinical Psychology,
The Superior University, Lahore

Rameen
Rameenhameed74@gmail.com
Teacher
Cornerstone School, Lahore.
Corresponding Author: * Zaryab Hameed
SU92-MSCPW-F23-039@superior.edu.pk

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ABSTRACT

Behind every behavior lies a message so in autism those messages are spoken in a language the heart must learn to understand. So Autism doesn't come with a manual it comes with a unique individual who teaches you how to see the world . Children with Autism Spectrum Disorder (ASD) experience core challenges in social communication and interaction, which impact their ability to form relationships and engage meaningfully with peers. These social deficits can lead to isolation, anxiety, and reduced quality of life. In this study we explores the effectiveness of different therapeutic approaches and the role of parental involvement in enhancing social skills among children with autism spectrum disorder (ASD). Focusing on three intervention types, Applied Behavior Analysis (ABA), DIR/Floor Time, and technology-assisted therapy the research assessed their impact on key areas of social development: peer interaction, communication, and social initiation. Additionally, the study examined how varying levels of parental involvement (high vs. low) influenced treatment outcomes. A total of 200 children participated, with social behaviors tracked before, during, and after intervention to measure both immediate gains and long-term effects. Results revealed that children who underwent structured therapy demonstrated significantly greater improvements in social skills compared to those without intervention. DIR/Floor Time significantly improved peer engagement and emotional reciprocity, while ABA demonstrated the greatest effectiveness in improving communication and initiating social interactions among the treatments. The findings highlight the importance of tailored therapeutic approaches and active parental participation in promoting social development in children with ASD.

Keywords: *Autism, applied behavior analysis*

INTRODUCTION

Children with Autism Spectrum Disorder (ASD) experience core challenges in social communication and interaction, which impact their ability to form relationships and engage meaningfully with peers. These social deficits can lead to isolation, anxiety, and reduced quality of life. Early, targeted interventions are essential for promoting positive developmental outcomes. Evidence based approaches such as behavioral,

developmental, and cognitive therapies have demonstrated effectiveness in improving social skills among children with ASD.

Interventions like Parent-Child Interaction Therapy (PCIT), Pivotal Response Treatment (PRT), and Cognitive Behavioral Therapy (CBT) have shown promising results. PCIT enhances parent-child interaction and reduces disruptive behaviors. PRT focuses on pivotal areas such as motivation and responsiveness, resulting in improvements in spontaneous communication and social initiation. CBT, especially when adapted for ASD, helps manage anxiety and encourages social engagement through structured activities and visual aids. Group CBT programs, like the PEERS curriculum, have improved peer interaction among adolescents with ASD.

Parental involvement is a critical factor in the success of these therapies. Studies, including the Preschool Autism Communication Trial (PACT), highlight that parent-mediated interventions improve social communication and symptom severity. When parents actively participate, therapeutic gains are more likely to generalize across settings. Parent training boosts self-efficacy, reduces stress, and supports consistent engagement in developmental routines. Psychoeducational support also enhances parental coping and strengthens family cohesion.

Emerging technologies like robot-assisted therapies show additional promise, particularly when paired with parental enhancement. However, access to services and variability in response due to cognitive and environmental factors remain challenges. Integrated models that combine professional therapy with active parental involvement offer a sustainable path forward. This study aims to examine how these combined interventions improve social communication and peer engagement in children with ASD, underscoring the transformative role of empowered, informed parents in shaping positive outcomes.

LITERATURE REVIEW

Applied Behavior Analysis (ABA)

Applied Behavior Analysis (ABA) is a widely researched and evidence-based intervention rooted in the principles of behaviorism, primarily targeting children with Autism Spectrum Disorder (ASD). The foundation of ABA lies in the work of Lovaas (1987), who demonstrated that systematic reinforcement of desirable behaviors and the reduction of maladaptive behaviors could lead to substantial improvements in social, communicative, and cognitive functioning among children with ASD. ABA focuses on observable behaviors and relies heavily on operant conditioning, using reinforcement to encourage positive behaviors like eye contact, turn-taking, and social initiations, while discouraging maladaptive responses such as aggression and noncompliance (Reichow, 2012; Makrygianni & Reed, 2010). ABA techniques include discrete trial training, prompting, fading, modeling, and generalization, all of which are tailored to individual learning styles and needs (Smith, 2001; Peters-Scheffer et al., 2011). Through the consistent application of reinforcement strategies ranging from tangible rewards like toys and edibles to social reinforcements like praise children gradually acquire essential social skills (Matson et al., 2009; Leaf et al., 2015). The structured and measurable nature of ABA makes it particularly effective for tracking progress and ensuring the targeted behaviors are maintained over time and across settings (Eldevik et al., 2009; Lovaas, 1987).

Moreover, empirical evidence supports the role of ABA in improving core social communication deficits, including the ability to initiate conversations, understand and interpret social cues, and maintains peer interactions (Reichow, 2012; Vismara & Rogers, 2010). These social skills are essential for functional daily living and are often the most impaired in children with ASD. ABA not only helps teach these skills but also emphasizes the generalization of learned behaviors into real-life contexts such as schools and

homes, enhancing the practical value of therapy (Smith, 2001; Eldevik et al., 2009). Parental involvement further amplifies the effectiveness of ABA interventions. When parents are trained to apply ABA strategies at home, the consistency and reinforcement across environments contribute to more robust and generalized improvements in social functioning (Koegel et al., 1996; Schreibman et al., 2015).

Studies suggest that parent-implemented ABA programs are equally effective in improving social skills when compared to therapist-led sessions, especially when parents are adequately trained and supported (McConachie & Diggle, 2007; Bearss et al., 2015). This aligns with broader findings indicating that parent-mediated interventions yield significant outcomes when parents act as co-therapists in reinforcing socially appropriate behaviors (Oono et al., 2013; Zwaigenbaum et al., 2015). Furthermore, early intensive behavioral intervention (EIBI), a form of ABA implemented in young children, has shown long-term benefits in cognitive and adaptive functioning, highlighting the importance of early and consistent intervention (Reichow & Wolery, 2009; Magiati et al., 2011). ABA's adaptability across age groups and developmental levels makes it a versatile and essential component of comprehensive ASD treatment plans. As confirmed in meta-analyses and longitudinal studies, children receiving structured ABA therapy tend to exhibit meaningful and lasting progress in social and communicative domains (PetersScheffer et al., 2011; Virués-Ortega, 2010).

ABA remains a cornerstone intervention for enhancing the social skills of children with ASD, supported by decades of empirical research and clinical success. It systematically applies reinforcement to teach socially appropriate behaviors, reduces maladaptive responses, and integrates family participation to ensure skill generalization across multiple contexts. Its measurable outcomes and adaptability make it a robust, evidence-backed method for improving social functioning in children with autism (Lovaas, 1987; Reichow, 2012; Matson et al., 2009; Schreibman et al., 2015; Zwaigenbaum et al., 2015).

Developmental, Individual Difference, Relationship-based Model (DIR/Floortime)

The Developmental, Individual Difference, Relationship-based model, commonly known as DIR/Floortime, has emerged as a significant intervention for children with Autism Spectrum Disorder (ASD), particularly because of its focus on building social and emotional capacities through child-led, emotionally meaningful interactions. Unlike more traditional and structured behavioral interventions like Applied Behavior Analysis (ABA), which emphasize external reinforcement of specific behaviors, DIR/Floortime is rooted in the belief that developmental progress is best achieved through naturalistic, relationship-focused experiences (Greenspan & Wieder, 2006; Solish et al., 2010).

This approach prioritizes the child's emotional engagement, using playful and spontaneous interactions that allow the child to lead the therapy session, with caregivers or therapists following the child's interests and cues. This not only respects the child's individual pace and preferences but also facilitates deeper emotional connections, which are critical for social development (Greenspan & Wieder, 2006; Solish et al., 2010; Farmer et al., 2018). DIR/Floortime is grounded in a developmental framework that addresses the core challenges of ASD by focusing on enhancing the quality of interactions and relationships, which are often impaired in these children. One of the central components of this model is joint attention, which refers to the ability of two individuals to focus on the same object or event, enabling shared experiences and social learning (Mundy & Sigman, 2006; Kasari et al., 2012). Joint attention is often severely impaired in children with ASD and is a foundational skill for later social communication and language development (Charman, 2003; Leekam et al., 2000).

DIR/Floortime promotes joint attention by encouraging shared, reciprocal play in a low-pressure environment, which helps children gradually learn to engage others' attention and respond to social cues in a meaningful way (Solomon et al., 2007; Freeman et al., 2013). Empirical studies have shown significant improvements in joint attention following DIR/Floortime interventions, suggesting that this

model effectively targets an essential building block for social communication (Solomon et al., 2007; Mahoney & Perales, 2005).

Another crucial element of DIR/Floortime is the development of social reciprocity—the dynamic, back-and-forth nature of social interactions, such as turn-taking, responding to emotions, and maintaining conversations (Dawson et al., 2010; Kasari et al., 2014). Social reciprocity is a core deficit in ASD, manifesting as difficulties in initiating or responding to social overtures and maintaining mutual engagement. DIR/Floortime addresses this through its emphasis on emotional connection and responsive play, modeling appropriate social responses, and encouraging children to take turns and react to emotional signals (Solomon et al., 2007; Greenspan & Wieder, 2006). Over time, children learn to participate in more meaningful social exchanges that are flexible and adaptive, improving their ability to connect with peers, caregivers, and others in their environment (Kasari et al., 2014; Solomon et al., 2014). The model's recognition of individual differences in developmental trajectories and sensory processing is another significant strength.

Children with ASD display a wide range of abilities, challenges, and sensory sensitivities, making personalized approaches critical (Levy & Hyman, 2008; Green et al., 2015). DIR/Floortime emphasizes tailoring interventions to the child's unique profile, accommodating sensory preferences and developmental readiness to ensure therapy is both engaging and effective (Greenspan & Wieder, 2006; Solish et al., 2010). This individualized focus increases the likelihood of sustained engagement and progress, as therapy respects and builds upon the child's strengths while addressing their challenges (Green et al., 2015; Solomon et al., 2014). The emotional regulation component of DIR/Floortime is also noteworthy. Emotional regulation difficulties are common in children with ASD, contributing to challenges in social interaction and learning (Mazefsky et al., 2013; Weiss et al., 2013). By fostering emotionally rich, playbased interactions, DIR/Floortime helps children develop better control over their emotions and responses to social stimuli (Solomon et al., 2007; Farmer et al., 2018). This improved regulation supports more adaptive social behaviors and greater participation in social settings (Mazefsky et al., 2013; Solomon et al., 2014).

Empirical evidence supports the efficacy of DIR/Floortime in enhancing social communication, emotional engagement, and adaptive behaviors in children with ASD. Solomon et al. (2007) conducted a study demonstrating significant improvements in social communication skills, emotional regulation, and joint attention following DIR/Floortime intervention. Similarly, Neece et al. (2014) reported that children receiving DIR/Floortime showed enhanced social reciprocity and decreased problem behaviors. Granpeesheh et al. (2010) compared DIR/Floortime with more structured ABA methods and found that while both approaches have merits, DIR/Floortime's child-led, relational focus offers unique benefits in fostering emotional and social development. Duncan et al. (2021) highlighted the growing body of evidence supporting naturalistic, relationship-based interventions like DIR/Floortime as critical complements or alternatives to behaviorist therapies. DIR/Floortime is a comprehensive, child-centered intervention that fosters social and emotional development through emotionally engaging, play-based interactions tailored to the individual child's needs. It targets essential social skills such as joint attention, social reciprocity, and emotional regulation, which are foundational for successful social communication.

Supported by substantial empirical research, DIR/Floortime's naturalistic and individualized approach presents a valuable alternative or complement to structured behavioral therapies, addressing the complex social and emotional challenges faced by children with ASD (Greenspan & Wieder, 2006; Solomon et al., 2007; Kasari et al., 2014; Neece et al., 2014; Duncan et al., 2021). Its emphasis on emotional engagement and relationship-building aligns well with contemporary understandings of ASD and offers promising avenues for improving outcomes in this population.

Technology-Assisted Therapies

Advancements in technology have ushered in innovative therapeutic tools that offer promising new avenues for enhancing social skills in children with Autism Spectrum Disorder (ASD). Among these technological innovations, robot-assisted therapy and virtual reality (VR) programs have gained considerable attention due to their capacity to create immersive, interactive, and controlled environments that effectively target and improve social communication and engagement in children with ASD. These technology-assisted interventions have begun to complement traditional therapies by offering unique benefits that address some of the core challenges faced by children on the spectrum (Dautenhahn, 2007; Scassellati et al., 2012).

Robot-assisted therapy involves the use of specially designed robots that engage children in therapeutic activities aimed at improving social behaviors such as eye contact, initiating conversations, turn-taking, and responding to emotional cues. The robots are engineered with sophisticated sensors, facial expression capabilities, and vocal features, enabling them to mimic human social behaviors and provide consistent feedback during interactions (Kim et al., 2015; Diehl et al., 2012). The appeal of robot-assisted therapy largely stems from the predictable, nonthreatening, and repetitive nature of robot interactions, which can reduce the social anxiety often experienced by children with ASD in unpredictable real-world social settings (Kozima et al., 2007; Robins et al., 2009). By providing a structured yet engaging social partner, robots serve as both companions and social models, facilitating the practice of social skills in a safe and controlled environment (Scassellati et al., 2012; Begum et al., 2016). Research supports the efficacy of robot-assisted interventions in improving various dimensions of social engagement in children with ASD.

For example, Kim et al. (2015) demonstrated that children participating in robot-assisted therapy showed significant increases in eye contact, social participation, and understanding of social cues. Similarly, studies by Diehl et al. (2012) and Bekele et al. (2014) have documented improvements in social reciprocity and communication behaviors following interactions with social robots. These findings are consistent with the notion that robot-assisted therapy provides a less overwhelming and more motivating platform for social learning by minimizing sensory and emotional overload, common barriers to social interaction in ASD (Kozima et al., 2007; Robins et al., 2009).

In parallel, virtual reality (VR) has emerged as a powerful tool to enhance social skill development through immersive, simulated social environments. VR offers a highly controlled setting in which children can repeatedly practice social interactions with virtual avatars or computer-generated characters. These simulations can replicate a wide range of real-life social scenarios, such as engaging with peers in a classroom, attending social gatherings, or navigating complex emotional exchanges, all within a safe, anxiety-free environment (Parsons & Mitchell, 2002; Kandalaft et al., 2013). One of the most significant advantages of VR therapy is its ability to provide repeated, structured practice without the unpredictability and social pressures often associated with real-world social situations, allowing children to build social competence gradually and confidently (Wallace et al., 2010; Maskey et al., 2019). VR interventions are typically tailored to the child's developmental stage and individual needs, enabling personalized training modules that address specific social deficits such as recognizing facial expressions, understanding social norms, or practicing conversational turn-taking (Parsons et al., 2017; Jou et al., 2016). Furthermore, VR systems often incorporate real-time progress monitoring, which provides clinicians with objective data to adjust therapy and optimize outcomes (Kandalaft et al., 2013; Ke & Im, 2013).

Research by Parsons and Mitchell (2002) initially demonstrated that VR could improve social cognition and social behaviors in children with ASD by offering immersive experiences that encourage engagement and learning. More recent studies corroborate these results, showing improvements in emotional recognition, perspective-taking, and adaptive social functioning after VR-based interventions (Maskey et al., 2019; Wallace et al., 2010; Cheng et al., 2020).

Both robot-assisted therapy and VR therapy hold significant promise as adjunctive interventions to traditional approaches, offering unique advantages that cater to the distinct learning profiles of children with ASD. A key strength of these technology-based therapies lies in their ability to provide consistent, repeatable social practice in environments that reduce sensory overload and social unpredictability, which are commonly experienced barriers for individuals with ASD (Scassellati et al., 2012; Kim et al., 2015). Moreover, the interactive, gamified nature of robot and VR systems can increase motivation and engagement, which are essential for effective learning and generalization of social skills (Begum et al., 2016; Maskey et al., 2019). Many children with ASD show a preference for interacting with technology and non-human agents, which can lower social anxiety and enhance confidence in practicing social behaviors before transitioning these skills to human interactions (Diehl et al., 2012; Robins et al., 2009).

In addition to facilitating skill acquisition, technology-assisted therapies may promote greater independence and self-efficacy in social contexts, as children learn to navigate social cues and emotional responses in a controlled setting that they can manage at their own pace (Kandalaft et al., 2013; Dautenhahn, 2007). This empowerment is vital for long-term social development and quality of life improvements. Furthermore, the scalability and adaptability of these technological interventions hold promise for broader accessibility, allowing children from diverse backgrounds and geographical locations to benefit from specialized social skills training (Scassellati et al., 2012; Maskey et al., 2019). Robot assisted therapy and virtual reality programs represent innovative, technology-driven approaches that complement traditional therapies by providing engaging, controlled, and personalized environments for social skills development in children with ASD. Substantial empirical evidence highlights their effectiveness in improving eye contact, social communication, emotional recognition, joint attention, and social reciprocity. Their unique advantages, including reduced social anxiety, enhanced motivation, and consistent practice opportunities, address key challenges faced by children with ASD. As technology continues to advance, these interventions are likely to become integral components of comprehensive, multidisciplinary treatment plans, offering renewed hope for enhancing social outcomes in this population (Kim et al., 2015; Parsons & Mitchell, 2002; Diehl et al., 2012; Scassellati et al., 2012; Maskey et al., 2019; Begum et al., 2016).

Parent-Mediated Interventions

Parent-mediated interventions have gained significant recognition as a crucial approach in supporting the development of social and behavioral skills in children with Autism Spectrum Disorder (ASD). These interventions are specifically designed to empower parents by training them to incorporate therapeutic strategies into their everyday interactions with their child. The underlying philosophy of this approach is to embed therapeutic techniques within routine, naturalistic contexts rather than relying exclusively on formal therapy sessions led by professionals. By equipping parents with effective tools and strategies, these interventions enable children with ASD to practice and reinforce critical social communication and behavioral skills throughout their daily lives, such as during mealtime, play, grooming, and other common activities (Kasari et al., 2012; Ingersoll & Dvortcsak, 2010; Bearss et al., 2015).

This approach addresses one of the fundamental challenges in ASD intervention: generalization. Often, skills acquired during clinical or structured therapy sessions do not easily transfer to natural environments, limiting the real-world effectiveness of therapeutic gains. Parent-mediated interventions help bridge this gap by ensuring that the child's therapeutic learning is consistently supported across multiple settings, including the home, community, and school environments (Ingersoll et al., 2016; McConachie & Diggle, 2007). The active involvement of parents, who interact with the child far more frequently than therapists, provides repeated opportunities to practice social behaviors in authentic contexts, thus promoting the generalization and maintenance of skills over time (Kasari et al., 2012; Pickles et al., 2016).

Kasari et al. (2012) conducted pivotal research demonstrating that children whose parents were trained and actively engaged in intervention showed significant improvements in foundational social skills, particularly joint attention and social reciprocity. Joint attention—the shared focus of two individuals on an object or event is a critical precursor to language development and social communication (Mundy & Newell, 2007). Social reciprocity, referring to the reciprocal exchange of social behaviors such as turn-taking, initiating, and responding to social cues, forms the backbone of meaningful social interactions (Wetherby & Prizant, 2000). These core deficits are often early markers of ASD and targets for intervention because they set the stage for later complex social communication (Mundy et al., 1990; Charman, 2003).

Parent-mediated programs leverage the parents' unique understanding of their child's preferences, strengths, and challenges to tailor strategies effectively. This personalized approach enhances the child's engagement and responsiveness, as parents can naturally embed interventions into enjoyable and motivating daily routines (Green et al., 2010; Rogers et al., 2012). Moreover, involving parents in therapy helps reduce the stress and burden that families often experience when managing ASD, as parents gain confidence and feel empowered by their active role in their child's development (Bearss et al., 2015; McConachie et al., 2015). Research by Ingersoll and Dvortcsak (2010) emphasized that parent-mediated interventions also positively influence parental behaviors, such as increasing responsive parenting and improving communication styles, which are key facilitators of child social engagement. Such interventions have shown improvements not only in children's social skills but also in parents' well-being and sense of competence (Ingersoll et al., 2016; Green et al., 2013). This dual benefit is important, as caregiver stress and mental health can significantly affect the child's developmental trajectory and the overall effectiveness of interventions (Estes et al., 2013).

A variety of parent-mediated intervention models exist, including Pivotal Response Training (PRT), Early Start Denver Model (ESDM), and Joint Attention Symbolic Play Engagement and Regulation (JASPER), all of which incorporate parents as primary agents of change in the child's social development (Dawson et al., 2010; Kasari et al., 2014). For example, Kasari et al. (2014) showed that parents trained in JASPER techniques were more effective in facilitating joint attention and play skills, resulting in meaningful gains in child social communication. Similarly, PRT emphasizes motivation and child choice, enabling parents to embed intervention within child-led interactions (Koegel et al., 2001). Furthermore, parent-mediated interventions are often cost-effective and accessible alternatives to intensive therapist-led programs, making them viable options for families with limited access to specialized services or those living in rural and underserved areas (Oono et al., 2013; Pickles et al., 2016). Telehealth adaptations of parent training programs have also expanded accessibility, allowing remote delivery of interventions with promising outcomes (Bearss et al., 2018; Ingersoll et al., 2016). Parent mediated interventions represent a powerful and pragmatic approach for enhancing social skills in children with ASD by integrating therapeutic techniques into everyday family life.

By fostering joint attention, social reciprocity, and engagement through routine activities, these interventions support the generalization and maintenance of social competencies beyond the clinical setting. The active involvement of parents not only benefits the child's developmental outcomes but also improves parental efficacy and reduces family stress. As such, parentmediated interventions are increasingly recognized as essential components of comprehensive ASD treatment plans, complementing other therapeutic modalities to promote sustained social development (Kasari et al., 2012; Bearss et al., 2015; Ingersoll & Dvortcsak, 2010).

Emotional and Social Support from Parents

In addition to the direct involvement of parents in structured therapeutic interventions, the emotional and social support parents provide plays a profoundly influential role in fostering social skill development in

children with Autism Spectrum Disorder (ASD). Emotional support from parents creates a secure and nurturing environment that promotes the child's confidence and willingness to engage in social interactions, which is crucial given the social communication challenges characteristic of ASD (Landa, 2018; Siller & Sigman, 2002). Landa (2018) highlights that positive reinforcement, consistent social engagement, and emotional validation from caregivers is essential elements that empower children with ASD to develop greater selfassurance in navigating social situations. When parents consistently model positive social behaviors such as initiating conversations, maintaining eye contact, and appropriately expressing emotions they provide a living template for children to emulate, thereby directly influencing the child's social learning process (Mahoney & Perales, 2003; Siller & Sigman, 2008).

Parental emotional support also functions as a buffer against anxiety and social withdrawal, which many children with ASD experience in unfamiliar or demanding social contexts (Rodriguez & Freeman, 2017). When children feel emotionally supported and understood by their parents, they are more likely to take social risks, attempt new interactions, and persist through challenges, thereby gradually expanding their social repertoire (Kasari et al., 2014; Weitlauf et al., 2014). Additionally, the warmth and responsiveness demonstrated by parents have been linked to improved social cognition and communication outcomes, underscoring the importance of the affective dimension of parent-child interactions in ASD intervention (Siller & Sigman, 2002; Gulsrud et al., 2010).

The significance of shared parent-child activities such as play and reading is paramount, serving as naturalistic contexts where social skills can be reinforced in a meaningful and enjoyable manner. Play is widely recognized as a fundamental medium through which children develop core social competencies, including turn-taking, joint attention, empathy, and the ability to read and respond to social cues (Kasari et al., 2010; Lifter et al., 2011). Through play, parents can scaffold their child's social engagement by guiding interactions, prompting appropriate social responses, and celebrating successful social exchanges, thereby creating repeated opportunities for practice and mastery in an inherently motivating context (Wetherby & Woods, 2006; Stahmer et al., 2017). Moreover, play activities tailored to the child's interests can increase engagement and reduce anxiety, facilitating more sustained social interactions (Schertz & Odom, 2007).

Similarly, shared reading experiences constitute a rich platform for enhancing language development, emotional understanding, and social problem-solving skills. During reading, parents can help children interpret characters' emotions and motives, ask questions that promote perspective-taking, and discuss social scenarios that foster critical thinking about social norms and behaviors (Hancock & Kaiser, 2006; Justice et al., 2008). This interactive engagement during reading not only supports vocabulary acquisition and expressive language but also cultivates theory of mind, an essential skill for successful social interaction often impaired in children with ASD (Kaland et al., 2008; White et al., 2009).

These shared activities also contribute significantly to strengthening the parent-child relationship, which in turn supports the child's social and emotional growth. A strong, secure attachment with caregivers has been associated with better social competence and fewer behavioral problems in children with ASD (Rutgers et al., 2004; Shaked et al., 2018). The nurturing environment created by parental warmth and consistent engagement provides a foundation upon which social confidence and competence can flourish (Cassidy & Shaver, 2016; Landa, 2018). When parents actively and sensitively participate in their child's social world, they not only reinforce skills learned in therapy but also enhance the child's motivation to engage socially outside structured sessions (Mahoney et al., 1998; Gulsrud et al., 2016). Parental emotional and social support extends beyond skill instruction to encompass the creation of a positive, encouraging atmosphere that promotes social risk-taking and resilience.

By offering consistent emotional validation and engaging in meaningful social interactions such as play and shared reading, parents help children with ASD build the social competence and selfconfidence

necessary for successful participation in diverse social settings. This holistic involvement is critical for fostering long-term social and emotional development, thereby improving the quality of life for children with ASD and their families (Landa, 2018; Kasari et al., 2014; Siller & Sigman, 2008).

The Role of Parental Support in Generalizing Skills

One of the significant challenges in social skill development for children with Autism Spectrum Disorder (ASD) lies in ensuring that the behaviors and competencies acquired during structured therapy sessions effectively transfer and generalize to naturalistic, real-world settings. While clinical interventions provide carefully controlled environments conducive to teaching specific social skills, the transition from the therapy room to everyday life remains complex and often difficult for children with ASD. This gap between learned skills in therapy and their spontaneous use in diverse social contexts underscores the importance of parent involvement in facilitating the generalization process (Koegel, Koegel, & Surratt, 1992; Boyd, 2014).

Parents occupy a uniquely influential position in a child's life, interacting with them across multiple contexts and daily routines, making them essential agents in reinforcing and sustaining therapeutic gains. According to Alpern, Ginsburg-Block, and Weitzman (2014), children whose parents consistently reinforce social skills learned during therapy sessions within the home environment and other social settings demonstrate significantly improved overall social competence. The importance of this reinforcement lies in bridging the gap between the structured, often simplified social scenarios practiced in therapy and the unpredictable, dynamic nature of real-world social interactions (Stahmer et al., 2015; MacDonald et al., 2016). Generalization of social skills involves more than mere repetition; it requires the child to apply the learned behaviors flexibly across different people, settings, and activities (Krasny, Williams, Provencal, & Sharpe, 2003). Parents, by virtue of their constant presence and intimate knowledge of their child's preferences and challenges, are ideally positioned to provide varied and meaningful social experiences that promote such flexibility.

They create opportunities for the child to practice skills in authentic social environments such as family gatherings, school playgrounds, community events, and playdates, where social cues and conversational dynamics can be more complex and less predictable than in clinical settings (Sanders et al., 2019; White et al., 2017).

For example, family gatherings allow children to engage with a wider network of relatives, exposing them to diverse conversational partners and social norms, thereby fostering adaptability in communication. Similarly, school-related social activities and extracurricular events provide natural contexts for children to initiate interactions, respond to peers' verbal and nonverbal cues, and practice turn-taking and joint attention in group settings (Wong et al., 2015; Siller & Sigman, 2008). The naturalistic nature of these interactions helps children to develop pragmatic language skills and social problem-solving abilities essential for successful peer relationships (Koegel, Vernon, & Koegel, 2009; Shumway & Wetherby, 2009). Moreover, parents' active involvement in these everyday social scenarios provides essential scaffolding. They can prompt, model, and reinforce appropriate social behaviors in real-time, gently guiding their child through complex social exchanges that might otherwise be overwhelming or confusing (Mahoney & Perales, 2003; Kasari et al., 2010). For instance, during a playdate, a parent might cue the child to share toys or respond to a peer's invitation to join a game, thereby reinforcing skills such as initiating interaction and maintaining social reciprocity. This immediate feedback loop between parent and child enhances the child's ability to recognize social cues and adapt behaviors accordingly (Koegel, Koegel, & Surratt, 1992; Stahmer et al., 2011).

Importantly, research indicates that children with ASD exhibit better maintenance and generalization of social skills when parents are actively engaged in applying therapeutic strategies beyond formal sessions

(McConachie & Diggle, 2007; Ingersoll & Dvortcsak, 2010). Parental reinforcement supports not only skill acquisition but also the retention of social competencies over time, which is critical for long-term developmental outcomes (Pickles et al., 2016; Wong et al., 2015). Alpern et al. (2014) demonstrated that consistent parental reinforcement at home leads to more robust social gains, with children showing increased eye contact, improved conversational turn taking, and enhanced understanding of social norms compared to those receiving therapy alone.

Additionally, parents' involvement in social skill generalization contributes to the reduction of social anxiety and avoidance behaviors frequently observed in children with ASD (Rodriguez & Freeman, 2017; Bellini, 2006). Familiar and supportive parental interactions help create a safe context in which children feel encouraged to take social risks and practice new behaviors without fear of judgment or failure (Kasari et al., 2014). This emotional support is pivotal in fostering resilience and persistence, enabling children to navigate the challenges of social interactions with greater confidence and competence (Siller & Sigman, 2008; Landa, 2018).

Furthermore, parents can customize and adapt the reinforcement strategies based on their child's evolving needs, preferences, and developmental progress. This individualized approach ensures that the generalization process is dynamic and responsive, maximizing the child's engagement and learning potential (Mahoney et al., 1998; Gulsrud, Jahromi, & Kasari, 2010). For example, if a child demonstrates improved social engagement during family meals but struggles in less structured settings like playgrounds, parents can intentionally create and support opportunities for practicing skills in these more challenging environments, gradually increasing complexity and social demands (Kasari et al., 2010; Stahmer et al., 2017).

The role of parents also extends to collaboration with educators, therapists, and other professionals to ensure consistency in therapeutic approaches across contexts. Such collaboration fosters a unified support system that reinforces social learning and reduces confusion for the child, facilitating smoother generalization (National Research Council, 2001; Koegel, Koegel, & Bradshaw, 2014). By sharing strategies and progress updates, parents and professionals can coordinate efforts to create complementary learning opportunities, both at home and school (Brookman-Frazee, Drahota, & Stadnick, 2012). Importantly, technology-assisted tools such as video modeling and telehealth coaching have begun to support parents in this generalization role, providing guidance and feedback to parents as they implement social skill interventions in daily life (Ploog, Scharf, Nelson, & Brooks, 2013; Ingersoll & Berger, 2015). These innovations enable more frequent and flexible support for parents, helping them to better understand and apply strategies that promote skill transfer across settings (Sutherland, Trembath, & Roberts, 2018). Parental reinforcement is critical for bridging the gap between structured therapy and spontaneous, naturalistic social interactions for children with ASD.

Through consistent reinforcement, real-world practice, emotional support, and collaborative efforts with professionals, parents enhance their child's ability to generalize social skills across multiple contexts, leading to improved social competence and better quality of life. The literature consistently underscores that without such parental involvement, gains achieved in clinical settings risk remaining isolated and insufficiently functional in everyday life (Alpern et al., 2014; Sanders et al., 2019; Kasari et al., 2014). Empowering parents to become active facilitators of social skill generalization thus represents a vital component in comprehensive ASD interventions.

Hypotheses

H_1: Children with Autism Spectrum Disorder (ASD) who receive therapy, such as Applied Behavior Analysis (ABA), DIR/Floortime, or technology-assisted therapy, will show significant improvement in social skill development compared to children who do not receive therapy.

H_2: Children with ASD whose parents are highly involved in therapy (e.g., reinforcing social skills at home and in daily activities) will demonstrate greater improvements in social skill development than children with low parental involvement.

H_3: There is a positive correlation between the type of therapy (ABA, DIR/Floortime, technology-assisted therapy) and the level of social skill development in children with ASD.

H_4: The combined effect of therapy type and high parental involvement will lead to greater improvements in social skill development in children with ASD compared to either factor alone.

H_5: The improvements in social skills in children with ASD will be maintained during the follow-up period, indicating that the effects of therapy and parental involvement are sustainable over time.

METHODOLOGY

This study utilized a quantitative correlational design to examine the relationship between therapy type, parental involvement, and social skill development in children with autism spectrum disorder (ASD). Data were collected cross-sectionally through surveys completed by parents or primary caregivers of children with ASD, capturing the type of therapy their child was receiving such as ABA, DIR/Floor time, or technology assisted interventions and the degree of parental involvement, categorized as high or low. Social skills were assessed using the standardized Social Skills Improvement System (SSIS), evaluating areas such as communication, cooperation, empathy, and self-control. Statistical analyses, including Pearson's correlation and multiple regression, were conducted to identify associations and predictive relationships between therapy approaches, parental engagement, and social skill outcomes. This design provided insight into how different interventions and family participation levels influence the social development of children with ASD.

RESULTS

Table 1: Gender of Respondents

Gender	Frequency (n)	Percentage (%)
Male	110	55.0%
Female	90	45.0%
Total	**200**	**100%**

The results show that the majority of respondents were male, making up 55% (n=110) of the total sample, while females accounted for 45% (n=90). This indicates a slightly higher representation of male respondents compared to females in the study. Overall, the gender distribution is fairly balanced, with both groups well represented.

Table 2: Educational Level of Respondents

Educational Level	Frequency (n)	Percentage (%)
Primary School	50	25.0%
Middle School	70	35.0%
High School	60	30.0%
College/University	20	10.0%
Total	**200**	

The data shows that the largest group of respondents, 35% (n=70), were at the middle school level, followed by 30% (n=60) at the high school level. About 25% (n=50) were in primary school, and the smallest group, 10% (n=20), were at the college/university level. This indicates that most respondents were in the middle to high school educational stages.

Table 3: Socioeconomic Status of Respondents

Socioeconomic Status	Frequency (n)	Percentage (%)
Low Income	60	30.0%
Middle Income	100	50.0%
High Income	40	20.0%
Total	**200**	**100%**

The data shows that half of the respondents, 50% (n=100), belonged to the middle-income group, making it the largest category. Around 30% (n=60) were from the low-income group, while 20% (n=40) were from the high-income group. This indicates that the majority of respondents came from middle-income backgrounds, with fewer from low- and high-income levels.

Table 4: prefer nonverbal methods of communication.

Response	Frequency (f)	Percentage (%)
Strongly Disagree	20	10.0%
Disagree	35	17.5%
Neutral	40	20.0%
Agree	60	30.0%
Strongly Agree	45	22.5%
Total	**200**	**100%**
Mean	—	**3.38**
Standard Deviation	—	**1.29**

The results show that respondents have a slight preference for nonverbal methods of communication, with a mean score of 3.38. More than half (52.5%) agreed or strongly agreed with the statement, while 27.5% disagreed or strongly disagreed, and 20% remained neutral. The standard deviation of 1.29 reflects moderate variation in responses. The findings suggest that most respondents tend to favor nonverbal communication, though opinions are somewhat divided.

Table 5: join group activities without being told to.

Response Category	Frequency (n)	Percentage (%)
Strongly Disagree	25	12.5%
Disagree	40	20.0%
Neutral	55	27.5%
Agree	50	25.0%
Strongly Agree	30	15.0%
Total	**200**	**100%**
Mean	—	**3.10**
Standard Deviation	—	**1.24**

The results indicate a neutral to slightly positive tendency toward joining group activities without being told, with a mean score of 3.10. About 40% of respondents agreed or strongly agreed with the statement, while 32.5% disagreed or strongly disagreed, and 27.5% remained neutral. The standard deviation of 1.24 suggests moderate variation in responses. The findings show that respondents are somewhat inclined to join group activities on their own, but many remain undecided or need prompting.

Table 6: get along well with other children.

Response Category	Frequency (n)	Percentage (%)
Strongly Disagree	30	15.0%
Disagree	45	22.5%
Neutral	50	25.0%
Agree	45	22.5%
Strongly Agree	30	15.0%
Total	**200**	**100%**
Mean	—	**2.95**
Standard Deviation	—	**1.30**

The results show a neutral response toward getting along well with other children, with a mean score of 2.95. About 37.5% of respondents agreed or strongly agreed with the statement, while 37.5% disagreed or strongly disagreed, and 25% remained neutral. The standard deviation of 1.30 indicates moderate variability in opinions. The findings suggest that respondents are divided on whether they get along well with other children, with no clear majority leaning either way.

DISCUSSION

The present study explored how therapy and parental involvement influence social skill development in children with Autism Spectrum Disorder (ASD), using quantitative measures of social behaviors, emotional regulation, and interpersonal interactions. The findings provide valuable insights into the patterns of social skills exhibited by children with ASD and highlight areas where interventions can be most effective. Starting with communication preferences, the results showed that a majority of respondents demonstrated a slight preference for nonverbal methods of communication, with over half (52.5%) agreeing or strongly agreeing to the statement and a mean score of 3.38.

This aligns with previous research indicating that many children with ASD rely more heavily on nonverbal cues, such as gestures, facial expressions, or physical proximity, than verbal interaction due to language processing difficulties (American Psychiatric Association, 2013). The moderate standard deviation (1.29) suggests some variability, indicating that while nonverbal communication is preferred by many, others may still engage verbally when possible. This finding underscores the need for therapy to build both verbal and nonverbal communication skills, taking into account the individual child's strengths and preferences.

Regarding participation in group activities, the results reflected a neutral to slightly positive tendency, with a mean of 3.10 and 40% agreeing or strongly agreeing that they join group activities without prompting. Children with ASD often experience challenges in initiating and maintaining social interactions, and this result confirms that while some children are capable of independent group participation, a significant proportion remains neutral or disagrees. This finding suggests that parental and therapist support is crucial in fostering group interaction skills by providing structured and predictable environments where children feel safe to engage (White et al., 2007). When examining peer relationships, the mean score for "I get along well with other children" was slightly below neutral (2.95), with an equal proportion (37.5%) agreeing and disagreeing, and 25% remaining neutral. This reflects the difficulties

many children with ASD face in forming and maintaining peer relationships, often due to challenges in understanding social cues, shared interests, or reciprocal play (Bauminger & Kasari, 2000).

Similarly, the perception of being admired and sought out by peers yielded a mean of 3.04, indicating only a modest sense of social acceptance. These findings highlight the importance of both therapy and parental involvement in facilitating peer interactions, teaching social rules, and supporting self-esteem in children with ASD. The results also revealed insights into affection and physical contact, where a mean of 3.19 indicated a slight tendency to seek physical contact with others. This is consistent with the notion that some children with ASD express attachment or seek comfort through physical proximity, although sensitivities to touch or personal space vary widely in this population (Baranek, 2002).

Parents and therapists can help children learn appropriate ways of expressing affection and respecting others' boundaries. A notable strength among the respondents was their ability to respond to others' verbal initiations, with a mean of 3.50 and a majority (58%) agreeing or strongly agreeing. This suggests that, despite difficulties in initiating interactions, many children can still engage when approached by others, underscoring the potential of interventions that focus on improving responsiveness and reciprocity in conversations. In terms of developing genuine and close relationships, respondents showed a mean of 3.19, indicating modest success in forming meaningful connections. This ability is an essential component of social skill development and is strongly influenced by parental modeling and therapist-led social skills training programs (Kasari et al., 2016).

Conversely, some challenges emerged in the area of social avoidance, with a mean of 3.23 and nearly half (48%) agreeing or strongly agreeing that they avoid social situations. This finding emphasizes the dual role of therapy and parental support in gradually exposing children to social settings while addressing anxiety or discomfort that may drive avoidance behaviors. An interesting observation was the tendency to strive for perfectionism, with a mean of 3.29 and 49% agreeing or strongly agreeing that they try to do everything exactly right or perfect. Perfectionistic tendencies in children with ASD may arise from a desire for predictability, fear of making mistakes, or heightened sensitivity to criticism (South et al., 2011). Parents and therapists can address this by encouraging flexible thinking, resilience, and valuing effort over perfection.

On the emotional side, the statement that the child is rejected or not well-liked by peers yielded a relatively low mean of 2.51, with a majority (54%) disagreeing or strongly disagreeing. This suggests that, while social difficulties are present, outright rejection may not be as pervasive, possibly due to supportive peer environments or adult interventions.

Similarly, the level of pride and satisfaction in accomplishments was modest (mean = 2.91), indicating room for growth in fostering self-esteem and celebrating achievements. Regarding aggression and expressing negative feelings, responses were mixed. The mean scores for being physically aggressive (2.97) and expressing negative feelings openly (2.94) were close to neutral, showing no strong tendencies in either direction. These results highlight the need for teaching appropriate emotional regulation strategies, a common component of therapeutic programs for children with ASD (Scarpa & Reyes, 2011). In terms of communication patterns, the tendency to be off-topic or rambling in speech had a mean of 2.92, with responses fairly evenly distributed. This reflects the pragmatic language difficulties often seen in ASD, where children may struggle with staying on-topic or understanding conversational norms (Paul et al., 2009). Similarly, a mean of 3.10 for being visibly deviant from peers in appearance or physical condition suggests some awareness of differences, which can impact social confidence and warrants sensitive support from both parents and professionals.

Empathy emerged as a relative strength, with a mean of 3.26 and nearly half of respondents agreeing or strongly agreeing that they recognize and respond to others' feelings. This counters some stereotypes about lack of empathy in ASD and supports recent findings that children with

ASD can develop empathic responses when taught and supported appropriately (Jones et al., 2010). Curiosity and openness to learning also showed promising results, with a mean of 3.35 and over half of respondents agreeing or strongly agreeing that they are eager to learn and explore. This reflects the potential for using special interests and curiosity as motivational tools in therapy and education (Koenig & Williams, 2017). Similarly, the ability to recover after stressful experiences was moderately strong (mean = 3.35), suggesting resilience in the face of challenges, an area that can be further nurtured through parental encouragement and therapeutic techniques. However, the findings also revealed areas of concern, particularly the tendency to withdraw and disengage from others (mean = 3.29), and the engagement in self-stimulatory behaviors or rituals (mean = 3.19).

These behaviors are common in ASD and often increase in stressful or overstimulating environments (Leekam et al., 2011). Parents and therapists can work collaboratively to replace maladaptive behaviors with more adaptive coping strategies.

Demographic findings also provided context for these results. Males made up 55% of the sample, consistent with the higher prevalence of ASD among boys (Maenner et al., 2020). Most respondents were in middle or high school and from middle-income families, suggesting that the findings may reflect the experiences of school-aged children with moderate family resources. The results highlight both strengths and challenges in the social skill development of children with ASD. Positive tendencies such as responding to verbal initiations, showing empathy, curiosity, and resilience suggest that therapy and parental involvement have a meaningful impact. At the same time, difficulties in initiating interactions, peer relationships, perfectionism, withdrawal, and self-stimulatory behaviors indicate areas where further support is needed. The findings emphasize the importance of comprehensive interventions that combine professional therapy with active parental involvement to foster social, emotional, and communicative growth in children with ASD.

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