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SUMMARY OF DOCTORAL DISSERTATION

**“Model of improvement of social interaction of
autistic students”**

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INTRODUCTION

The phenomenon of autism spectrum disorder (ASD) has garnered significant attention due to its prevalence across various age groups and its profound impact on social and communicative abilities. Despite decades of research, many aspects of autism remain elusive. This research endeavors to address two critical areas of concern within the autistic community: social skills and communicative interaction. These skills, vital for meaningful social integration, often present significant challenges for individuals with autism. By focusing on theoretical and experimental methodologies, the aim is to devise strategies to enhance social and communicative competencies among autistic individuals, thereby improving their societal integration.

Social interaction and communicative interaction are fundamental domains affected in autism spectrum disorder. This research seeks to contribute to these areas, facilitating better outcomes for autistic students in school and community settings. While early detection of autism remains a subject of interest, studies have yielded inconclusive results regarding identifiable markers in infancy. Although some infants may exhibit subtle signs of ASD in social and language development, the variability in early symptoms complicates definitive diagnosis.

Individuals with ASD, regardless of verbal fluency, encounter persistent challenges in language and communication. Despite potential variations in symptom intensity and presentation, certain social communication and language characteristics persist from childhood into adulthood, distinguishing individuals with ASD from their neurotypical peers. Additionally, symptoms of ASD may manifest as early as 12 to 18 months of age, although variability exists among individuals.

ASD affects individuals across diverse demographics, with a higher prevalence among boys than girls. The term "spectrum" encapsulates the range of symptoms, abilities, and impairment levels

observed in ASD. Communication difficulties in children with ASD encompass delays in language development, challenges in initiating and sustaining conversations, and unconventional language use.

The core characteristics of autism—impairments in social interaction, social communication, and social imagination—stem from deficits in representing mental states. These impairments manifest in various ways, including difficulties in understanding others' communications and challenges in engaging in reciprocal social interactions. Moreover, ASD impacts non-literal or figurative speech comprehension, further hindering social communication.

Despite the heterogeneity of ASD, core impairments persist across individuals. Understanding and addressing these challenges are crucial for developing effective interventions and fostering the social and communicative growth of individuals with ASD. By acknowledging the complexities of autism and embracing a multidimensional approach, researchers and practitioners can better support the diverse needs of individuals on the autism spectrum.

Chapter 1. Social and Communicative Interaction of Autistic Students

- Overview

The field of autism research is characterized by constant evolution, marked by changes in terminology and reassessments of traditional definitions of associated traits. As the prevalence of autism spectrum disorder (ASD) continues to rise, scientific interest in the field intensifies, accompanied by heightened public awareness and concern. Studies by Pellicano, Dinsmore, & Charman (2014), Pellicano et al. (2018), and Silverman (2011) support the notion that the increasing prevalence of ASD has spurred international research efforts.

The significant increase in ASD prevalence documented by the Autism and Developmental Disabilities Monitoring Network (2012) report underscores the need for a deeper understanding of the disorder. Various factors, including expanded diagnostic criteria, early identification, and heightened awareness, contribute to the dramatic rise in ASD diagnoses, as noted by Matson & Kozlowski (2011) and Charman (2002), supported by King & Bearman (2011).

ASD poses intricate challenges across multiple domains, necessitating proactive planning to facilitate smooth transitions across developmental stages, particularly during the school-age years (Gangadharan, Bhaumik & Gumber, 2016). Individualized planning, tailored to address specific needs, is essential for maximizing outcomes for students with ASD (Szidon, Ruppert, & Smith, 2015).

The definition of autism, as outlined in the Encyclopedia of Psychopharmacology (Stolerman & Price, 2015), emphasizes persistent deficits in social interaction, communication, and restricted, repetitive patterns of behavior. Historical perspectives, dating back to the work of Eugen Bleuler and

Leo Kanner, trace the evolution of the term "autism" and its conceptualization within the realm of neurodevelopmental disorders (Volkmar, 2013; Harris, 2018; Baron-Cohen, 2015).

The emergence of the term "Autism Spectrum Disorders" (ASD) reflects the recognition of the diverse range of symptoms and challenges experienced by individuals on the autistic spectrum (Faras, Al Ateeqi, & Tidmarsh, 2010; Jordan, 2007). ASD encompasses a spectrum of disorders, including autism and Asperger syndrome, characterized by deficits in communication, social interaction, and stereotypic behavior (Newschaffer et al., 2007).

The diagnostic classification of ASD, as delineated in the Diagnostic and Statistical Manual of Mental Disorders (DSM), includes Asperger's syndrome, pervasive developmental disorder, and autistic disorder (Matson, Kozlowski, Hattier, Horovitz, & Sipes, 2012; Mazurek et al., 2017). Additionally, DSM-V incorporates Rett syndrome and childhood disintegrative disorder into the ASD category, reflecting the complexity of diagnostic differentiation (Tsai & Ghazinddin, 2014).

The term "autism science" encompasses the broad spectrum of research endeavors aimed at understanding and addressing the complexities of ASD (Zimmerman, 2008). This interdisciplinary approach integrates observations, hypotheses, experimentation, and empirical data to advance knowledge and inform evidence-based interventions in the field of autism research

1.1 Autism - its dimensions and manifestation in modern society and education

The historical landscape of autism spectrum disorder (ASD) reveals a stark contrast in the approach to children's behavioral, psychological, and developmental issues. Prior to the establishment of child psychology and psychiatry as recognized specialties, practitioners lacked

comprehensive guidance in working with such children. Institutional care primarily emphasized group-based interventions and behavior control through punitive methods.

Symptoms of ASD typically surface before a child's third birthday, although diagnosis may occur later. The prevalence of ASD in the UK is estimated to affect approximately 1 in 100 individuals, with a noticeable gender discrepancy favoring boys. Research suggests that ASD can be diagnosed as early as before the third birthday, with increasing efforts to detect signs even in infancy.

Historically, identifying autism before early childhood was rare, but recent years have seen advancements in early detection efforts. Studies have explored early indicators of autism, with some suggesting the possibility of detecting parental signs within 18 months of a child's birth. However, clear differentiation can be challenging due to the behavioral complexities of children.

Parents often notice symptoms of ASD in their children as early as 18 months, prompting them to seek specialized evaluation. Early intervention is crucial for the child's future development, with potential indicators including delayed speech, lack of response to name, limited eye contact, and repetitive behaviors.

Misconceptions surrounding ASD abound, including its prevalence, classification as a neurological disorder rather than an emotional one, and the fallacy of parental influence on its development. ASD is not a curable condition, but early intervention and effective educational programs can greatly impact a child's progress.

The primary characteristics of ASD revolve around social and communication challenges, with manifestations varying by age. Pre-school children may exhibit delayed speech, lack of response to others, limited interest in social interaction, and repetitive behaviors. School-age children

may struggle with verbal communication, understanding non-literal language, limited social interaction, and repetitive behaviors.

Additional therapy, such as cognitive behavioral therapy, may be recommended for students with ASD, especially those with severe learning difficulties. In the classroom, autistic students may face challenges with social interaction, communication, and behavior, including difficulty interpreting social cues, unconventional communication methods, and engagement in repetitive behaviors. Understanding these challenges is essential for effective support and intervention strategies.

1.1.1. General characteristics of student with autism

The environment in both educational and home settings for autistic individuals must prioritize simplicity and safety. The Ontario Ministry of Education (2007) emphasizes effective communication approaches tailored for educational environments. These approaches include acknowledging and reciprocating communication attempts, organizing the environment to encourage communication, demonstrating effective communication methods, offering prompts, and incorporating pauses during activities. Additionally, Harrower & Dunlap (2001) suggest strategies such as peer-mediated intervention, antecedent manipulations, and self-management.

Autism is described as a disorder impacting various aspects of an individual's interaction with their surroundings, leading to isolation and socialization challenges. Autistic individuals often construct isolated worlds, exhibit minimal concern for others, and engage in solitary activities. Many experience loneliness even in the presence of others, impacting their academic success and general well-being (Ashbaugh, Koegel, & Koegel, 2017).

Linguistic development in autistic children often presents deficits, with approximately half not developing speech or offering only individual words and phrases. The other half may exhibit non-functional speech characterized by peculiar discourse patterns. Autistic children often display stereotyped movements and behaviors, which are of great interest and absorb their attention for extended periods. Attempts to disrupt these behaviors can result in intense outbursts (Dalakoura, 2013).

Stereotyped movements in autistic children are described as rhythmical, repetitive, stable in position, bizarre, and non-functional (Gritti et al., 2003). The intellectual level of autistic children can vary widely, from upper levels of intelligence to severe mental retardation. Some may possess special skills, such as in mathematics or music, but these talents do not compensate for the communication challenges and difficulty forming emotional relationships.

Remarkable abilities in mathematics, calculation, mechanical skills, art, and music are observed in some individuals with autism, with one in ten exhibiting a special skill (Maes, 2016). These strategies can be applied during individual or group work and can benefit both autistic and neurotypical students. Inclusion of neurotypical students in an interactive teaching process fosters maximum knowledge acquisition for all students.

1.1.2. Causes of Autism

Autism Spectrum Disorder (ASD) is a complex developmental disability typically identifiable within the first three years of a child's life. It stems from neurological differences that affect normal brain function, impacting communication, social interaction skills, and behavior. ASD encompasses

a range of conditions characterized by difficulties in non-verbal communication, social interactions, and repetitive behaviors.

The etiology of autism is multifaceted, with genetic, neuropsychological, and biological factors playing significant roles. Genetic studies have revealed a strong hereditary component, with familial studies indicating a higher prevalence of autism among siblings of autistic individuals. While specific genes responsible for autism haven't been identified, research suggests a complex interaction of multiple genes.

Neuropsychological studies have demonstrated deficits in various areas such as attention, memory, language, and social cognition among autistic individuals. These deficits vary widely, with some individuals exhibiting severe impairments while others have milder difficulties. Additionally, autistic individuals often struggle more with processing social information compared to other types of information.

Biological factors, including abnormalities in brain structure and function, have also been implicated in autism. Structural abnormalities in the cerebellum, temporal lobe, and other brain regions have been observed in autistic individuals. Neurochemical studies have indicated elevated serotonin levels in some autistic individuals, suggesting a potential role of neurotransmitter abnormalities in the etiology of autism.

Environmental influences also contribute to ASD, with recent research emphasizing the interaction between genetic predisposition and environmental factors. The recognition of various genetic syndromes associated with ASD underscores the complexity of its etiology.

ASD encompasses a spectrum of conditions ranging from mild to severe, including autistic disorder, Asperger's disorder, childhood disintegrative disorder, and pervasive developmental disorder. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has revised the diagnostic criteria for ASD, replacing subcategories with a unified Autism Spectrum Disorder diagnosis.

Overall, autism presents unique challenges in social interaction, communication, and behavior. Despite ongoing research efforts, autism remains a complex and multifaceted condition requiring comprehensive understanding and support from various professionals and caregivers across disciplines.

1.1.3. Diagnosis of Autism

The study conducted by an Irish team in 2013 aimed to explore the intelligence quotient (IQ) of preschoolers diagnosed with Autism Spectrum Disorder (ASD). The study, involving 50 children, showed a significant positive relationship between the group's Full Scale Intelligence Quotient (FSIQ)/Developmental Quotient (DQ) at two different time points. The results indicated an increase in FSIQ/DQ over time for both High Functioning ($IQ \geq 70$) and Low Functioning ($IQ < 70$) subgroups, with 32% of the total sample exhibiting a clinically significant change in FSIQ/DQ of 15 points or more from Time 1 to Time 2.

This finding underscores the importance of assessing cognitive functioning in children with ASD during the preschool years. Autism typically manifests before the age of 3, with boys being affected more frequently than girls. The diagnostic criteria for ASD, as outlined in the DSM-5,

include persistent deficits in social communication and interaction, along with restricted, repetitive behaviors.

These deficits in social communication and interaction include challenges in social-emotional reciprocity, deficits in nonverbal communication behaviors, and difficulties in establishing and maintaining relationships. Restricted and repetitive patterns of behavior include stereotyped or repetitive motor movements, insistence on sameness, intensely focused interests, and heightened or diminished reactions to sensory stimuli.

Furthermore, ASD symptoms must be present in the early developmental period and result in clinically significant impairment in social, occupational, or other crucial areas of functioning. These disturbances cannot be better explained by intellectual disability or global developmental delay, although ASD and intellectual disability may coexist.

1.1.4. Autistic students in society. In Educational system: social activity and communication

The social functioning of students with autism presents significant challenges, leading to social isolation if appropriate support measures are not implemented. Fontes and Pino-Juste (2022) emphasize the importance of societal actions and increased social awareness to enhance the social functioning of students with autism, thereby reducing disruptive behaviors and promoting their overall well-being.

Autistic students must be viewed and treated as complete individuals, requiring concerted efforts from society to facilitate their integration. Failure to take appropriate social actions for autistic

students can result in withdrawal, social isolation, lack of self-confidence, communication difficulties, and regression in social and emotional development (Bellini, 2006; Tantam, 2000; Welsh et al., 2001).

From a sociological perspective, humans are inherently social beings whose development and functioning are influenced by external stimuli. The acceptance of positive signals from the external world fosters better social functioning, with modern approaches emphasizing the significant impact of social and cultural factors on individuals' lives (Lloyd, 2011; Umanilo, 2020).

The main social challenges faced by individuals with autism include difficulties in interpreting facial expressions, verbal and non-verbal communication, understanding gestures, maintaining eye contact, and initiating and maintaining social interactions. These challenges hinder effective communication and integration into society (Jefkins, 1994).

Effective intervention strategies are crucial for supporting the social development of individuals with autism. Therapy plays a pivotal role in addressing their unique needs, encompassing communication skills, social development, and behavior management (Shenoy et al., 2017). Early intervention is particularly important, as therapy tailored to the individual's needs can significantly impact their social and communicative abilities (Brites, 2020).

Therapeutic interventions should be multi-faceted and tailored to the specific needs of each student. Individualized support, including 1:1 interactions and group activities, can facilitate social skill development (Ros et al., 2011). Therapy should be conducted over an extended period and within a familiar environment, involving various specialists, classmates, and family members (Krieger et al., 2021).

A wide range of therapies are available to support the social and communicative needs of students with autism, including activities to stimulate social interaction, behavioral modification techniques, language and communication exercises, sensory integration therapies, and auditory practice therapies (Lang et al., 2012; Sinha et al., 2011).

The TEACCH method, which emphasizes structured teaching environments, is also effective in improving the social functioning of individuals with autism (Zeng et al., 2021). Overall, these therapeutic approaches aim to enhance social functioning, improve communication skills, and address inappropriate behaviors in students with autism.

1.2 Social characteristics of autistic students

Individuals with autism spectrum disorder face various social and communication challenges. Communication, as described by Vicker (2009), is portrayed as a social act that inherently involves one or more interlocutors. However, for students with autism, social interaction often presents formidable hurdles. These difficulties stem from the unwritten rules governing social interactions, which are contingent upon the desires of the interlocutors and the specific circumstances, as elucidated by Mamas, Daly, Cohen, and Jones (2021).

The social characteristics exhibited by students with autism spectrum disorder are multifaceted. They frequently struggle with understanding the perspectives of others, interpreting everything around them from their own viewpoint. This difficulty extends to realizing that others possess unique ideas, thoughts, and motivations. Consequently, they may misinterpret social cues and exhibit challenges in maintaining appropriate eye contact, as highlighted by Hadjikhani et al. (2017).

In conversation, individuals with autism may speak too fast or too loudly, often failing to remain on topic and becoming easily distracted by their own thoughts. This tendency to engage in monologues about preferred topics rather than interacting with others can hinder effective communication. Furthermore, they may exhibit behaviors such as talking aloud to themselves in public spaces, demonstrating a lack of awareness regarding social appropriateness.

Additional challenges include difficulty in attending to information when highly stimulated or stressed, making socially inappropriate statements unintentionally, and struggling with conversational initiation, facilitation, and termination. Individuals with autism may also lack an understanding of the importance of adjusting their communication style based on their interlocutor and the context, often addressing all individuals in the same manner, irrespective of their social status or relationship.

Moreover, they may encounter difficulties in comprehending incoming messages, leading to a reluctance to seek clarifications. Despite these challenges, individuals with autism often strive to maintain a positive self-image, employing sophisticated language to conceal their comprehension difficulties. However, they may resort to lying or engage in repetitive questioning, inadvertently causing social discomfort.

Furthermore, individuals with ASD may exhibit difficulty in recognizing deception from others, as well as challenges in deciphering nonverbal cues and selecting appropriate social communication strategies. While they may easily recognize basic emotions, they often struggle to interpret subtle expressions or understand what is socially appropriate in a given situation.

In addition to social communication challenges, individuals with ASD may display various characteristics outlined by Vicker (2009). These include a seeming egocentricity, a preference for

concrete interpretations, difficulty grasping the bigger picture in social situations, and a propensity for rituals and repetitive activities. They may also demonstrate exceptional skills in certain areas, alongside mood disorders, obsessive-compulsive tendencies, and sensory sensitivities.

Moreover, individuals with ASD may face challenges in fine motor skills, executive function skills, and comprehension, despite exhibiting good memory for details. These difficulties often necessitate advocacy, support, and supervision for independent living and employment. Furthermore, individuals with ASD are vulnerable to social or sexual abuse, which may exacerbate their social isolation.

In summary, the extensive exploration of social communication challenges and associated characteristics highlights the complexities faced by individuals with autism spectrum disorder. Understanding these challenges is crucial for providing effective support, fostering empathy, and facilitating meaningful social interactions for individuals with ASD.

1.3 Communicative characteristics of autistic students

The communicative characteristics of autistic students pose significant challenges for specialists. Over the last decade, there has been a notable increase in the presence of students with Autism Spectrum Disorder (ASD) in full inclusion classrooms. This trend is attributed to the implementation of the normalization principle and increased advocacy from parents and the educational community. Integration into school environments has been shown to enhance interaction with typically developing peers, thereby facilitating the development of appropriate social and communicative skills.

The developmental stages of communication in infants, including those with ASD, are explored. While infants with normal development progress through stages of communication, infants with ASD exhibit differences, such as the absence of gestures, imitation of sounds, and lack of eye contact. As they progress into the locutionary stage, children with ASD may demonstrate limited oral speech, often using it for specific purposes like making requests or repeating phrases stereotypically.

Patterns of behaviors and language use observed in children with ASD include repetitive or rigid language, echolalia, narrow interests, and exceptional abilities. Echolalia, characterized by the repetition of words or phrases, is seen as a means for social interaction among children with ASD. Additionally, children may exhibit sing-song speech, use stock phrases, and demonstrate advanced abilities in specific areas of interest.

Uneven language development is a common trait among children with ASD, with some exhibiting remarkable vocabulary in certain topics but struggling with pragmatic skills. Poor non-verbal conversation skills, including difficulties with gestures and maintaining eye contact, further hinder communication. Intervention strategies, such as the Milieu teaching treatment, have shown promise in improving communication skills in children with ASD.

The involvement of parents and caregivers in treatment programs is crucial for their success, as they play a significant role in the child's daily routine. Early detection of communication deficits and intervention by speech-language specialists are emphasized for optimal outcomes. Treatment goals may range from teaching basic speech and language skills to utilizing alternative communication methods for non-verbal children.

Research initiatives, such as the Autism Centers of Excellence program, aim to uncover the causes of ASD and develop effective treatments. Studies focus on various aspects, including reliable

assessments of speech and language delays, the influence of parents on treatment outcomes, and innovative approaches to communication enhancement.

This chapter concludes by highlighting the subtle communicative characteristics of individuals with ASD, emphasizing the need for awareness and research efforts to improve understanding and develop effective treatments. The evolving perspective on language deficits in ASD, as reflected in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), underscores the importance of focusing on communication in autism research.

1.4 Strategies and approaches for improvement of social and communicative interaction of autistic students

Individuals with Autism Spectrum Disorder (ASD) often encounter challenges in social interactions and daily activities. Some autistic individuals experience delays in language development or may not use speech at all, necessitating the use of alternative communication methods. Communication is typically classified into verbal and non-verbal forms. Non-verbal communication, which encompasses gestures, facial expressions, eye contact, and body language, is particularly important for individuals on the autism spectrum due to difficulties with verbal communication. Non-verbal cues enable autistic individuals to convey messages and express their needs, emotions, and intentions. Recognizing and understanding non-verbal communication is essential for effective interaction and support for individuals with ASD in navigating social environments and relationships.

1.4.1. Stages of communication

The stages of communication in individuals with autism spectrum disorder (ASD) are crucial for understanding their ability to interact with others and convey messages. These stages include pre-intentional and intentional communication.

1. Pre-Intentional Communication: At this stage, individuals with ASD may engage in actions or behaviors without intending to interact with others.

- Subcategories include:
 - **Reflex Communication:** Limited reflex behavior without clear intention.
 - **Reactive Communication:** Reacting to stimuli from the environment, with behaviors that can be interpreted by others.
 - **Proactive Communication:** Acting on the environment to communicate, showing varying vocalizations and understanding facial expressions and voice tone.

2. Intentional Communication: This stage involves deliberate attempts to convey messages to others. Subcategories include:

- **Primitive Communication:** Initiating intentional communication through actions, which may be understood by those familiar with the situation.

- **Conventional Communication:** Acquiring formalized communication skills, understanding the value and meaning of words, and improving both receptive and expressive communication.

The transition from pre-intentional to intentional communication is challenging for individuals with ASD, influenced by the severity of the condition and related factors. According to the Hanen Programme, stages of intentional communication include:

1. **Own Agenda Stage:** Self-absorbed behavior, mainly using pre-intentional communication.
2. **Requester Stage:** Communicating basic needs and desires to capture others' attention.
3. **Early Communicator Stage:** Asking for things, using echo language, and gradually engaging in two-way interaction.
4. **Partner Stage:** Using speech to hold simple conversations in familiar environments but may struggle in stressful or unfamiliar situations, reverting to repetitive phrases.

Understanding these stages is essential for supporting individuals with ASD in developing their communication skills and interacting effectively with others.

1.4.2. Improving Communication Development

The National Autistic Society provides various techniques to support children with autism spectrum disorder (ASD) in developing speech, language, and social communication skills:

1. **Follow Their Lead:** Encourage the child by engaging in activities that capture their attention, allowing them to make choices and end activities when they decide to. Use appropriate words to accompany non-verbal signals, such as 'had enough' or 'stop'.
2. **The Early Stages:** When a child starts to talk, use single words to communicate, pointing at objects while using the correct word to associate it with the object.
3. **Use Expansions:** Gradually introduce additional information in response to the child's communication, providing more context or details.
4. **Build in Time for Communication:** Instead of immediately helping the child with tasks, ask them if they need help twice, giving them a chance to communicate their needs.
5. **Be Face-to-Face:** Maintain face-to-face interaction to observe facial expressions, which aid in understanding the child's interests.
6. **Imitate:** Copy the child's actions and words to encourage communication, starting with sensory behaviors and progressing to verbal communication.
7. **Try Gestures and Visual Supports:** Use gestures like nodding or shaking the head to signify 'yes' or 'no', and employ visual aids such as pictures or cue cards to enhance comprehension.
8. **Give Feedback:** Reward the child's attempts to communicate and provide praise or comments on their achievements to reinforce communication efforts.
9. **Give Reasons to Communicate - Encourage Requests:** Create an environment rich with activities that motivate the child to communicate, such as placing desired objects out of reach or providing toys that require assistance to operate.
10. **Find Opportunities to Interact:** Even when the child appears disinterested, continue seeking opportunities for communication and interaction, employing various techniques.

11. **Using Augmentative and Alternative Communication (AAC) Supports:** AAC includes tools, devices, and strategies for non-verbal individuals to communicate, requiring assessment by specialists to determine the most suitable options based on the individual's needs and abilities.

These techniques aim to support children with ASD in developing their communication skills, facilitating interaction and participation in various activities.

1.4.3. Social skills and interaction of children with ASD.

Children with Autism Spectrum Disorder (ASD) exhibit various challenges in social skills, encompassing communication through non-verbal means, social interaction, and the ability to create and maintain relationships. Some common social characteristics observed in individuals with ASD include difficulties with eye contact, understanding others, responding to others, and comprehending appropriate social conventions. Additionally, they may struggle with managing conflicts, displaying appropriate emotions, sharing emotions and objects, and initiating friendships.

Social skills are crucial for individuals with ASD, as they promote positive outcomes such as friendships and happiness, and improve participation in groups and communities. A comprehensive tool has been developed by specialists to provide social skill information from families, teachers, and experts, aiming to integrate children with autism into the community effectively. Furthermore, social skills are considered critical for success in the 21st century, encompassing abilities such as compassion, empathy, teamwork, and networking.

Interaction plays a vital role in children's development, both typically developing and those with ASD. However, children with ASD often face difficulties in initiating, responding to, and maintaining interactions or conversations. Deficits in social interaction are evident from an early age, characterized by a lack of crying for attention, avoidance of eye contact, resistance to physical contact, and indifference towards seeking parental contact.

Negative experiences from past social interactions can lead to increased anxiety and stress in individuals with ASD, impacting their ability to comprehend and use verbal language effectively. Teachers working with children with ASD in specialist units or mainstream schools must be attentive to their communication needs and difficulties, ensuring that social and communication skills are practiced and taught consistently.

Social skills are fundamental for individuals with ASD to navigate social interactions and foster meaningful relationships. Understanding and addressing their unique social challenges are essential for promoting their integration and participation in various social settings.

1.4.4. Development of social skills.

Individuals with Autism Spectrum Disorder (ASD) often struggle to learn and navigate social interactions, relying on guesswork to understand social norms. Developing social skills for individuals with ASD involves several key elements: enhancing language and cognitive abilities, achieving positive social outcomes such as happiness and friendship, supporting sensory and communication integration, focusing on attention and timing, and practicing social skills in real-world settings with direct guidance.

Various professionals, including social educators, clinicians, speech pathologists, teachers, psychologists, and therapists, play crucial roles in teaching social skills to individuals with ASD across different settings like home, community, and school. Group-based social skill interventions are particularly valuable as they provide opportunities for practicing new skills in contexts that encourage social interaction.

Effective social skill group interventions should: translate abstract social concepts into concrete actions, offer predictability and structure, foster partnership and cooperation, adapt language complexity to individual needs, boost self-esteem and self-awareness, and provide numerous opportunities for skill practice to facilitate generalization into real-life situations.

Key ingredients for successful social skills interventions include aligning with ASD goals and following a sequential, progressive design. Effective strategies for promoting social skills include social skills groups, social stories, pivotal response training, peer tutoring, adult-directed instructions, and visual scripts. Interventions based on peer training and peer network have shown promising results in promoting positive social outcomes in children with ASD.

1.5 Summary

The condition of autism presents multifaceted challenges from various perspectives, necessitating extensive preparation and expertise from all involved specialists, including educators, therapists, and caregivers. While young children with autism may exhibit a preference for solitary activities, the development of meaningful friendships becomes increasingly crucial as individuals transition into adolescence and adulthood. Establishing social connections requires considerable time and effort for individuals with Autism Spectrum Disorder (ASD), emphasizing the importance of initiating social skill development from an early age.

Middle and high school years, as well as the workplace for adults, can pose significant challenges due to the prevalence of bullying among individuals with autism. Cultivating friendships serves as a protective factor against bullying, highlighting the significance of fostering social connections. Genuine friendships are built upon shared interests, mutual trust, and reciprocal sharing of thoughts and feelings. However, individuals with autism may face difficulties in navigating social interactions, particularly in discerning appropriate boundaries and communication norms.

The process of making friends extends beyond mere likability, instead revolving around shared interests and experiences. While individuals with autism often possess intense interests in specific areas, finding others who share these passions can be challenging. Participation in clubs, community events, or online forums related to one's special interests can facilitate the formation of meaningful connections.

Self-advocacy plays a crucial role in navigating social interactions for individuals with autism. Communicating personal preferences and boundaries allows neurotypical individuals to better understand and accommodate the unique needs of those with ASD. Miscommunication stemming from differences in neurology further underscores the importance of explicitly addressing social nuances and hidden social rules, collectively referred to as the "hidden curriculum."

Tailoring interventions and support strategies to align with the individual personalities and needs of those on the autism spectrum is paramount. By providing opportunities for social experiences, promoting self-advocacy, and elucidating social conventions, individuals with autism can enhance their social skills and forge meaningful connections with others. Ultimately, fostering a supportive and inclusive environment that celebrates neurodiversity is essential for promoting the well-being and social integration of individuals with autism.

Chapter 2. Research Design

2.1. Aim and objectives of the research

The placement of students with (ASD) in inclusive educational settings has been widely advocated as a means to enhance social engagement with peers. However, research indicates that the majority of these interactions are often facilitated and guided by teachers or teaching assistants. Children with autism, characterized by social and communication deficits, demonstrate limited participation in peer activities without prompting from educational staff.

These findings underscore the insufficiency of inclusive placements in fostering spontaneous social interactions among students with ASD and their peers. Without appropriate intervention, individuals with autism are at risk of experiencing peer rejection and social isolation even within inclusive environments.

The primary aim of this research is to investigate whether an intervention program based on Structured Play Groups (SPG) can improve the social and communicative interactions of selected students aged 5 to 6 years diagnosed with ASD in Greece.

To achieve this goal, the following research objectives were identified:

1. **Assessment of Intervention Effectiveness through Observational Data:** The first objective aims to evaluate the overall effectiveness of the SPG intervention by analyzing observational data collected during free play sessions in the designated play setting. This objective seeks to measure changes in the frequency and quality of social interactions exhibited by children with ASD following the intervention.

2. **Evaluation of Intervention Impact using Autism Social Skills Profile (ASSP):** The second objective focuses on assessing the impact of the SPG intervention on children with ASD

through pre- and post-intervention score changes on the Autism Social Skills Profile (ASSP). This objective aims to quantify improvements in specific social skills and behaviors associated with ASD before and after participation in the structured play groups.

2.2. Hypothesis of the research

Null Hypothesis (H₀): The selected children with ASD will not show a statistically significant improvement in their social and communicative interaction after the implementation of a SPG intervention program in the school setting.

Alternate Hypothesis (H₁): The selected children with ASD will show a statistically significant improvement in their social and communicative interaction after the implementation of a SPG intervention program in the school setting.

2.3. Methodology and research methods

The purpose of this research is to evaluate the effectiveness of a SPG intervention program to the social and communicative interaction of children diagnosed with ASD in a school setting.

Research design

The research design employed in this study is a multiple baseline design across participants. This experimental approach is particularly suited for single-subject research, as it allows for the examination of behavior changes over time in response to an intervention, without necessitating a reversal to pre-intervention behaviors. Multiple baseline designs are widely recognized as one of the

most popular types of designs in applied behavior analytic research due to their efficacy in demonstrating causal relations between interventions and behavior changes.

The advantage of using multiple baseline designs lies in their ability to demonstrate the effects of an intervention on the target behavior while the intervention is being implemented. Unlike reversal designs, which require the reversal of acquired skills to pre-intervention levels, multiple baseline designs do not demand such reversals. This is beneficial both practically, when reversal of acquired skills is not feasible, and ethically, when it may be morally questionable to aim for behavior reversal.

Procedure

In this research, the multiple baseline design across participants consisted of three phases: baseline, intervention, and maintenance. Baseline data were collected for each participant to establish a stable baseline level of the target behavior. Following baseline data collection, the intervention phase commenced, during which the Structured Play Groups (SPG) intervention was implemented. This intervention aimed to promote social and communicative interactions among children with Autism Spectrum Disorder (ASD) by facilitating structured play sessions.

The intervention phase was followed by a maintenance phase, conducted to assess the persistence of intervention effects over time. During each phase, data were collected through 10-minute observations of the target behavior. Observations occurred during free play sessions, which occurred once weekly at the end of the school day. Participants attended these sessions alongside typically developing peers who assisted them during the intervention phase.

The intervention sessions occurred twice per week, lasting approximately 30 minutes each. Prior to each session, typically developing peers received training on the SPG program to ensure

effective implementation. The research team closely monitored the sessions, providing support and guidance as needed.

Throughout the study, consent was obtained from both the parents of the children with ASD and the typically developing peers participating in the intervention. Additionally, thorough briefings were provided to all stakeholders involved, including teachers and parents, to ensure clarity regarding the research goals, procedures, and duration.

Overall, the research design employed in this study allowed for a systematic evaluation of the effectiveness of the SPG intervention in promoting social and communicative interactions among children with ASD. By utilizing a multiple baseline design across participants, the study aimed to establish causal relations between the intervention and observed behavior changes, contributing valuable insights to the field of applied behavior analysis.

Structured Play Groups

The Structured Play Groups (SPG) intervention utilized in this research is a well-established evidence-based approach aimed at improving various outcomes, including social, communication, behavior, and academic skills, among school-age learners with Autism Spectrum Disorder (ASD). SPGs are designed for small groups of children, typically comprising both children with ASD and typically developing peers. Key characteristics of SPGs include consistent meeting times, designated play spaces, and the use of evidence-based practices by facilitators to promote the utilization of target skills by learners with ASD.

Introduction to the intervention

The SPG program implemented in this research spans a duration of 12 weeks to one year, with sessions occurring twice weekly and lasting between 30 to 60 minutes each. The ratio of children with ASD to typically developing peers ranges from 1:2 to 2:3, ensuring ample opportunities for social interaction and skill development. It is imperative to select suitable peers for the program, characterized by good social and age-appropriate play skills, higher communication abilities, positive interactions with children with ASD, and a willingness to comply with instructions and suggestions from facilitators.

The intervention is structured around play themes and activities tailored to the interests and skills of participants with ASD. Play themes encompass socio-dramatic play, building/construction play schemes, social or interactive games, and music or movement activities. Roles are assigned to both children with ASD and typically developing peers, with facilitators providing instructions and support prior to each session. Routines are established to provide predictability and minimize stress for children with ASD, who may find changes and transitions challenging.

The SPG intervention begins with an introduction phase, during which participants are familiarized with the goals and structure of the program. Play themes are selected based on observations and input from teachers, and specific roles are assigned to participants for each session. A common routine is followed for each session, including opening and closing sequences that promote social interaction and cooperation.

Two play themes were selected for the intervention: Building Blocks and Restaurant. In the Building Blocks theme, participants collaborate to build models using sets of building blocks, assuming roles such as Engineer, Builder, and Supplier. The facilitator oversees the activity and gradually reduces involvement as participants gain independence. In the Restaurant theme,

participants take on roles such as Cook, Server, and Client, engaging in activities related to food preparation and service. Roles are adjusted based on group size to ensure optimal participation and engagement.

Overall, the SPG intervention provides a structured and supportive environment for children with ASD to practice and develop social and communicative skills while engaging in enjoyable activities. Through guided play and interaction with typically developing peers, participants have the opportunity to enhance their ability to communicate effectively, collaborate with others, and navigate social situations, ultimately fostering greater social inclusion and participation.

Measures

The measures utilized in this study encompassed diagnostic screenings, peer selection assessments, and dependent measures aimed at evaluating changes in social functioning among participants with Autism Spectrum Disorder (ASD) following the Structured Play Groups (SPG) intervention.

Diagnostic Screening:

Autism Screening: The Social Communication Questionnaire (SCQ) was employed as a screening tool to assess symptoms of ASD in children aged 4 years and older. The SCQ is completed by parents and consists of 40 items focusing on behaviors observed over the past three months. It has demonstrated high sensitivity and specificity in samples of children with no intellectual impairments, making it a valuable tool for ruling out ASD in typically developing peers.

Peer Selection: The SPG Peer Selection Checklist was utilized to assess the social and communication skills of typically developing peers and their interactions with peers with ASD. The

checklist, developed by Autism Focused Intervention Resources & Modules (AFIRM), facilitated the selection of suitable peers for participation in the SPG intervention.

Dependent Measures:

Behavioral Rating Scales: The Autism Social Skills Profile (ASSP) was employed to measure social functioning in children and adolescents with ASD aged 6 to 18 years. This rating scale, completed by teachers, caregivers, or other adults familiar with the individuals being assessed, comprises 49 items related to various social behaviors and skills. It provides scores for Total social functioning and subscales for Social Reciprocity, Social Participation/Avoidance, and Detrimental Social Behaviors.

Observation: An observational system was developed to measure the impact of the SPG intervention on the social and communicative interaction of participants with ASD. This system utilized a 15-second interval recording method to capture unprompted social engagement, defined as verbal or non-verbal attempts to express communicative intent involving both social initiation and response. Specific behaviors observed included joining play activities, requesting information or assistance, using gestures, asking questions, giving or sharing objects, showing positive physical contact, and responding to peers' attempts to initiate interaction.

Setting and materials

The study took place in designated play areas within kindergartens, providing a consistent and accessible environment for intervention sessions. The play areas were equipped with toys conducive to shared and sociodramatic play, selected based on their interactive potential and

alignment with the intervention themes. Sessions occurred twice weekly for 30 minutes each, allowing ample time for participants to engage in structured play activities designed to promote social interaction and communication skills.

2.4 Sample

Three kindergartners diagnosed with Autism Spectrum Disorder (ASD), ages 5 to 6, participated in the study. They were fully included in general education classrooms in South Attica, Greece. Each child had a formal diagnosis of ASD by pediatricians or registered child psychiatrists and exhibited significant social and communication deficits.

Giorgos:

1. **Age:** 5 years and 5 months.
2. **Diagnosis:** Received ASD diagnosis at 4 years and 6 months.
3. **Characteristics:** Maintained unsteady eye contact, responded positively to questions, struggled with disruptions to routines, had difficulty recognizing emotions, and faced challenges in processing visual social cues.

Katerina:

1. **Age:** 5 years and 3 months.
2. **Diagnosis:** Diagnosed with autism at 4 years and 10 months.
3. **Characteristics:** Capable of speaking in complete sentences with delayed echolalia, engaged in solitary activities at school, participated in social dialogue with prompting but avoided sharing details about her relationships with peers.

Dimitris:

1. **Age:** 5 years and 8 months.
2. **Diagnosis:** Received ASD diagnosis at 3 years and 4 months.
3. **Characteristics:** Exhibited mild vocabulary and language delays, struggled with maintaining eye contact and answering questions about him, rarely initiated conversations and often spoke softly.

Chapter 3. Data Analysis

3.1. Observational data analysis

Based on the observational data analysis, the effectiveness of the Structured Play Groups (SPG) intervention on children with Autism Spectrum Disorder (ASD) was assessed during the free play period in the designated setting. A multiple baseline design across participants was employed, and observational data were collected during baseline, intervention, and maintenance phases.

To analyze the effectiveness of the intervention, visual inspection of graphical representations of the data was conducted, which is a common approach in single-case design research. Additionally, the percentage of non-overlapping data (PND) was calculated. PND is a method for synthesizing single-subject literature, providing a quantitative measure of treatment effect.

The interpretation ranges for the strength of treatment effect score using PND are as follows:

PND	
0 – 50%	Ineffective
50 – 70%	Questionable
70 – 90%	Effective
90% +	Very effective

The mean social engagement for the participants was 19.78% of baseline intervals, 31.33% of intervention intervals and 29% of maintenance intervals.

Based on the analysis of individual participant data:

Giorgos: His attendance rate was 91.67%. His social engagement was noted in 23% of the baseline intervals, 41% of intervention intervals and 43% of maintenance intervals The PND was

calculated to be 90.91% between baseline and intervention phases and 100% between baseline and maintenance phases, indicating a very effective treatment. The graphical representation for Giorgos also illustrate these results.

Katerina: Her attendance rate was 100%. Her social engagement was observed at an average of 22% of the baseline intervals, 32.08% of intervention intervals and 19% of maintenance intervals. Her PND was 58.33% between baseline and intervention phases indicating questionable effects for social engagement from baseline to intervention. Her PND between baseline and maintenance phases was 0%, indicating no treatment effects. The graphical representation for Katerina also illustrate these results.

Dimitris: His attendance rate was 87.5%. His social engagement was observed in an average of 14.33% of the baseline intervals, 20.90% of the intervals during the intervention phase and 25% of maintenance intervals. The PND for Dimitris was found to be 80% between baseline and intervention phases and 75% between baseline and maintenance phases. These results indicate an effective treatment. The graphical representation for Dimitris also illustrate these results.

Overall, the applied intervention program was found to be effective in improving the social engagement of students with ASD during the free play period. However, Katerina's results varied, showing questionable intervention effects. Nonetheless, the research objective of assessing the effectiveness of the intervention was satisfied based on the collected data.

3.2 ASSP data analysis

In the data analysis of the ASSP scores to assess the overall effectiveness of the selected SPG intervention on children with ASD as measured by pre and post (quantitative) score changes of the Autism Social Skills Profile (ASSP).

	Total	Social Reciprocity	Social Participation/Avoidance	Detrimental Social Behaviors
Pre - intervention	105.33	43.67	25	27.33
Post - intervention	118	51.33	28	29

The results indicate that, on average, participants improved their total social functioning and specific aspects of social skills, particularly social reciprocity and social participation/avoidance, after the SPG intervention. However, there was no significant change observed in detrimental social behaviors. The graphical representations for each participant (Giorgos, Katerina, and Dimitris) also illustrate these improvements. Overall, the findings suggest that the SPG intervention had a positive impact on the social skills of children with ASD.

SPSS analysis

The SPSS analysis conducted for each subscale of the Autism Social Skills Profile (ASSP) and the total social functioning scores yielded the following results:

1. **Social Reciprocity (SER):**

- A paired-samples t-test revealed a significant increase in SER subscale scores from pre-intervention (M=43.67) to post-intervention (M=51.33), $t(2)=-6.38$, $p=0.024$. This indicates that the intervention successfully improved the participants' skills related to maintaining reciprocal social interactions.

2. **Social Participation/Avoidance (SPA):**

- There was a significant increase in SPA subscale scores from pre-intervention (M=25) to post-intervention (M=28), $t(2)=-5.20$, $p=0.035$. This suggests that the intervention effectively enhanced the participants' skills related to social engagement and withdrawal from social participation.

3. **Detrimental Social Behaviors (DSB):**

- The paired-samples t-test did not reveal a significant difference in DSB subscale scores between pre-intervention (M=27.33) and post-intervention (M=29), $t(2)=-1.89$, $p=0.199$. This indicates that the intervention did not have a significant effect on reducing socially inappropriate behaviors or behaviors contributing to negative peer experiences.

4. **Total Social Functioning:**

- There was a significant increase in total social functioning scores from pre-intervention (M=105.33) to post-intervention (M=118), $t(2)=-56.83$, $p=0.021$. This indicates that the intervention significantly improved the overall social functioning of the participants.

Overall, the SPSS analysis confirms that the Structured Play Group (SPG) intervention program effectively improved various aspects of social skills and total social functioning in children with Autism Spectrum Disorder (ASD).

3.3. Summary

The aim of this research was to evaluate the effectiveness of a selected intervention on the social and communicative interactions of students with Autism Spectrum Disorder (ASD). This was achieved through the collection and analysis of both observational and Autism Social Skills Profile (ASSP) data.

Observational data on social engagement were collected during three phases: baseline, intervention, and maintenance. Social engagement was defined as a combination of initiations and responses. The interval recording system used showed an overall improvement in social engagement, with mean scores increasing from 19.78% at baseline to 31.33% during the intervention phase and 29% during the maintenance phase. Visual inspection and Percentage of Non-overlapping Data (PND) analysis indicated effectiveness in improving social engagement for Giorgos and Dimitris, while Katerina's results were ineffective to questionable.

The ASSP was administered during baseline and maintenance phases to assess social functioning. Pre- and post-intervention results showed substantial improvements in Total social functioning for all participants, with significant increases noted in the Social Reciprocity subscale. Minimal improvement was observed in the Social Participation/Avoidance subscale for all participants, and small improvements were reported in the Detrimental Social Behaviors subscale for Giorgos and Dimitris, with no improvement noted for Katerina.

Furthermore, SPSS analysis, including paired-samples t-tests, was conducted on mean Total social functioning and subscale scores. The results indicated statistically significant improvements in Total social functioning, as well as in the Social Reciprocity and Social Participation/Avoidance subscales, while no significant difference was found in the Detrimental Social Behaviors subscale scores. Therefore, the null hypothesis was rejected, suggesting that the selected Structured Play Group (SPG) intervention program significantly improved the social and communicative interaction of the participants with ASD.

Discussion

The discussion highlights the effectiveness of the Structured Play Groups (SPG) intervention program for kindergarten students with Autism Spectrum Disorder (ASD) in improving social and communicative interactions. The study aimed to assess the applicability of such interventions at younger ages than previously researched, and the results indicate that SPG programs can indeed be effective for this age group.

Despite limitations in sample size and constraints imposed by the COVID-19 pandemic, the study demonstrated positive outcomes. The intervention led to improvements in social engagement, as observed through both observational data and the Autism Social Skills Profile (ASSP). Participants showed increased social initiations and responses, with sustained improvements during the maintenance phase. Moreover, typically developed peers played a crucial role in facilitating interaction, highlighting the effectiveness of peer-mediated techniques in promoting positive social development.

The ASSP data further supported the effectiveness of the intervention, with significant improvements observed in Total Social Functioning, Social Reciprocity, and Social Participation/Avoidance subscales. However, minimal improvements were noted in the Detrimental Social Behaviors subscale, indicating that some aspects of social behavior may require further intervention.

The discussion also addresses the practicality and cost-effectiveness of the SPG intervention, emphasizing its potential as a sustainable practice for psychosocial interventions. The findings align with previous research on SPG interventions and peer-mediated techniques, suggesting the generalizability of results beyond the current study.

Despite the positive outcomes, the study has limitations, including the small sample size, limited settings, and reliance on the researcher as the intervention facilitator. Future research should focus on replicating the study with larger sample sizes, exploring the effectiveness of the intervention in different settings, and assessing long-term outcomes. Additionally, further investigation into the generalizability of results and the potential for home-based interventions is warranted.

Overall, the study contributes to the growing body of literature on SPG interventions for children with ASD and provides valuable insights into effective strategies for promoting social and communicative interaction in kindergarten-age children.

Conclusion

The conclusion effectively summarizes the key findings and implications of the study. It highlights the importance of early intervention for children with autism spectrum disorder and the potential benefits of implementing structured play group interventions in kindergarten settings. By emphasizing the positive outcomes observed in social and communicative behaviors, as well as the role of trained facilitators and typically-developed peers in fostering interactions, your conclusion underscores the significance of providing supportive environments for children with ASD to thrive.

Additionally, it acknowledges the need for further research to replicate and expand upon the findings of this study, particularly in exploring the generalizability of SPG interventions to other settings and populations. This highlights a clear direction for future studies in this area.

Overall, the conclusion effectively ties together the main points discussed throughout the paper and reinforces the importance of continued efforts to support the social and communicative development of children with ASD

Contribution

Contribution to theory

The study significantly contributes to the theoretical understanding of social and communicative interaction in autism by implementing a Structured Play Group (SPG) intervention program. It emphasizes the importance of promoting positive social relationships and provides insights into the underlying mechanisms involved in fostering social engagement among children with autism. By highlighting the ecological validity of interventions, the study underscores the importance of interventions applicable within the natural environment of children with autism, thereby promoting transferability and generalizability of skills. Additionally, the study enhances the existing theoretical framework of peer-mediated approaches by demonstrating the efficacy of structured play groups in enhancing social and communication skills. Furthermore, it contributes to theories of inclusive education by facilitating the social integration of students with autism in kindergarten settings, promoting inclusive practices, and emphasizing the importance of creating inclusive environments.

Contribution to Practice

In terms of practical implications, the study introduces an evidence-based intervention specifically designed for kindergartens and students with autism, offering a practical approach to improving social and communicative interaction. It emphasizes the significance of early intervention by intervening during the early developmental stages to address social skills deficits among children with autism. Moreover, the study underscores the importance of collaboration with kindergarten

personnel in implementing the intervention program, promoting consistent implementation, and enhancing the supportive environment for students with autism. By integrating the intervention program into natural kindergarten settings, the study ensures its applicability and relevance to everyday life, thereby promoting the generalization of learned skills and enhancing intervention effectiveness. Additionally, the study provides opportunities for professional development by offering practical guidelines, resources, and training on implementing the program and facilitating social interactions, thereby enhancing the knowledge and skills of practitioners working with students with autism.

Overall, the study's contributions to both theory and practice provide valuable insights into effective strategies for supporting the social and communicative development of children with autism, emphasizing the importance of early intervention, collaboration, and inclusive practices in educational settings.

Publications

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