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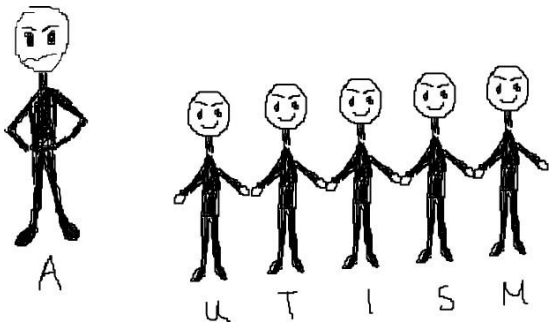
Faculty of Education

PhD Thesis

IMPROVEMENT OF SOCIAL ABILITIES IN CHILDREN WITH AUTISM SPECTRUM DISORDER IN INCLUSIVE SETTINGS THROUGH PEER-MEDIATED INTERVENTION

MEJORA DE LA INTERACCIÓN SOCIAL ENTRE NIÑOS CON TRASTORNO DEL ESPECTRO AUTISTA EN ENTORNOS INCLUSIVOS MEDIANTE LA INTERVENCIÓN MEDIADA POR COMPAÑEROS



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TÍTULO DE LA TESIS: Mejora de la interacción social entre niños con trastorno del espectro autista en entornos inclusivos mediante la intervención mediada por compañeros
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INFORME RAZONADO DEL/DE LOS DIRECTOR/ES DE LA TESIS

(se hará mención a la evolución y desarrollo de la tesis, así como a trabajos y publicaciones derivados de la misma).

El trabajo de investigación realizado por Aikaterini Michalopoulou, codirigido por los docentes Juan Manuel Muñoz González y María Dolores Hidalgo Ariza presenta, a nuestro juicio, los indicios de calidad mínimos y el rigor científico suficiente como para que sea presentado a defensa pública y evaluado en Comisión Académica en orden a la posible adquisición del grado de Doctor. Consta de un artículo publicado que ofrece a la comunidad científica información válida para comprobar la efectividad de la intervención mediada por pares (PMI) combinada con la actividad de intereses comunes para estudiantes de escuela primaria con trastorno del espectro autista. Este artículo han sido publicado en una revista de reconocido prestigio y rigor científico, como puede verse en el informe sobre las indicaciones de calidad de la tesis doctoral. En esta tesis doctoral se ha realizado una revisión sistemática y actualizada de la literatura, evaluando la información científica disponible hasta el momento sobre la interacción social entre niños y niñas con trastorno del espectro autista en entornos inclusivos mediante la intervención mediada por pares. En cuanto a la metodología, cabe destacar la combinación de un meta-análisis junto con un método cuantitativo, de carácter descriptivo. Una conclusión muy esperanzadora surge de los resultados del trabajo: ya que constituye un método prometedor para mejorar las habilidades sociales en los estudiantes con TEA promoviendo el progreso en la aceptación e inclusión de estos. El estudio presentado también conduce a la literatura al demostrar cómo los docentes pueden utilizar fácilmente la capacitación entre pares en combinación con actividades basadas en los intereses comunes de los estudiantes en un entorno escolar.

Por todo ello, se autoriza la presentación de la tesis doctoral.

Córdoba, a 28 de marzo de 2023

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ABSTRACT

In recent, years general and special education teachers are often called to support students with autism educating in mainstream Greek schools. Their peers are a key factor in everyday life of an ASD student in a school setting as they spend together the one third of each day. Consequently, the purpose of the present study was to explore the effects of a PMI program through an activity that they have in common in improving language and communication abilities among ASD students and their typical peers in inclusive school settings. A metanalysis introduced the efficacy of PMI prior to the intervention research.

The research involved 25 typical students and 5 ASD students aged 7-10 who served in the school's Parallel support[1]. In the beginning of the project, Parallel Support Teachers of ASD students completed the Gilliam autism rating scale (GARS, 2006) in cooperation with their parents. The peers of ASD students were trained through a PMI program and a common interest activity to interact with them during school recess. A multiple baseline design was used on each participant in order to define the effects of the intervention. Through observation probes, the responses and the initiations of all ASD students were noted by trained school staff. At the end of follow-up phase, the social validity data was collected through questionnaires conducted by the researcher to peer participants and teachers.

Results indicated that the social skills intervention had direct and vigorous improvements on social initiations and responses in all five participants. Some changes were noticed in all study variables, keeping up a positive slant within the rates of initiating and responding to interactions, and a negative slant within the rate of time the ASD students maintained low interactions. More specifically, the results of the intervention phase showed an increase in both of these two variables. Then, the follow-up phase depicted important results for the academic community, also showing an increase in all ASD students' responses and initiations.

[1] Parallel support in Greece is a co-teaching program designed to deliver education services in inclusive settings.

Generally, the current study supplements the existing PMI research, which leads to the possible use of this valid tool that could be used in school settings in order to increase the socialization of ASD students.

RESUMEN

En los últimos años, los maestros de educación general y especial a menudo son llamados para ayudar a los estudiantes con autismo a educar en las escuelas griegas convencionales. Sus compañeros son un factor clave en la vida cotidiana de un estudiante con TEA en un entorno escolar, ya que pasan juntos la tercera parte de cada día. En consecuencia, el propósito del presente estudio fue explorar los efectos de un programa PMI a través de una actividad que tienen en común para mejorar las habilidades de lenguaje y comunicación entre los estudiantes con TEA y sus compañeros típicos en entornos escolares inclusivos. Un metanálisis presentó la eficacia del PMI antes de la investigación de la intervención.

La investigación involucró a 25 estudiantes típicos y 5 estudiantes ASD de 7 a 10 años que sirvieron en el apoyo paralelo [2] de la escuela. Al comienzo del proyecto, los maestros-terapeutas de educación especial de estudiantes con TEA completaron la escala de calificación de autismo de Gilliam (GARS) en cooperación con sus padres. Los compañeros de los estudiantes ASD fueron capacitados a través de un programa de PMI y una actividad de interés común para interactuar con ellos durante el recreo escolar. Se utilizó un diseño de línea de base múltiple en cada participante para definir los efectos de la intervención. A través de sondeos de observación, el personal escolar capacitado tomó nota de las respuestas y las iniciaciones de todos los estudiantes con TEA. Al final de la fase de seguimiento, los datos de validez social se recopilaron a través de cuestionarios realizados por el investigador a los compañeros participantes y profesores.

Los resultados indicaron que la intervención de habilidades sociales tuvo mejoras directas y vigorosas en las iniciaciones y respuestas sociales en los cinco participantes. Se notaron algunos cambios en todas las variables del estudio, manteniéndose un sesgo positivo en los índices de iniciar y responder interacciones, y un sesgo negativo en el

[2] El apoyo paralelo en Grecia es un programa de coenseñanza diseñado para brindar servicios educativos en entornos inclusivos.

índice de tiempo que los estudiantes TEA mantuvieron interacciones bajas. Más específicamente, los resultados de la fase de intervención mostraron un aumento en estas dos variables. Luego, la fase de seguimiento mostró resultados importantes para la comunidad académica, mostrando también un aumento en las respuestas e iniciaciones de todos los estudiantes TEA.

En general, el estudio actual complementa la investigación existente del PMI, lo que conduce al posible uso de esta herramienta válida que podría usarse en entornos escolares para aumentar la socialización de los estudiantes con TEA. En general, el estudio actual complementa la investigación existente del PMI, lo que conduce al posible uso de esta herramienta válida que podría usarse en entornos escolares para aumentar la socialización de los estudiantes con TEA.

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INTRODUCTION

Autism a single spectrum disorder characterized by deficits in social communication and interaction, as well as restricted repetitive patterns of behavior, interests, or activities, observed in early childhood (DSM-5; American Psychiatric Association, 2013). These characteristics can become more intense in playground activities with other children in the same age. Children with autism are usually excluded from general education schools because of their disabilities, which prevent them from coping with the highly demanding general school environment. Social interaction is one of the common difficulties in students with ASD that may affect their successful inclusion (Rodriguez-Medina et al., 2018). These characteristics impact their ability to interact with peers and teachers in the school setting. Children with ASD have fewer friends, friendships with low quality (Dean et al., 2017; Petrina et al., 2016) and bad perception of the friendship's meaning (Rodriguez-Medina et al., 2018, Camargo et al., 2014). They don't know how to behave with peers and have difficulties to manage their emotions in any situation. As a result of these difficulties, they feel isolate and with limited or qualitatively poor social interactions even in inclusive settings like school (Owen-DeSchryver et al, 2008; Simpson & Bui, 2016). The inclusion of children with disabilities in general school promotes the development of their social skills (Koege et al. 2001; Chapin et al. 2018). Inclusion of students with autism has been a challenge for educators who indicate gaps in professional training, especially regarding interventions in the school context (Ramos et al., 2018).

THEORETICAL AND CONCEPTUAL JUSTIFICATION

CHAPTER I - AUTISM SPECTRUM DISORDER

1. Historical Review

The term "autism" derives from the Greek word "εαυτός" and indicates the tendency of the individual to closes himself.

In 1911 the Swiss psychiatrist Bleuler used him the term "autism" for the first time to denote the loss of contact and communication of the mentally ill with reality Kakouros & MAnaiadaki, 2005). Some years later, according to Notas (2006), Leo Kanner, who was born in Austria and studied in Vienna, left for America in 1924 and took over the John Hopkins Clinic in Baltimore. In 1943, he described first “autism” and used the term "early childhood autism" to describe childhood psychosis. At the time, he believed that people with autism have normal intelligence but as a significant percentage of children later found to have "intellectual disabilities" and severe learning difficulties. Since the disorder was introduced, its profile and symptomology have undergone numerous changes (Mallabar, 2019). Most of times autism coexists with language disorders and speech. In 1944 Asperger described a class of children which called "autistic psychopathy" but he believed that there was a fundamental birth defect that caused these characteristic problems. This syndrome (Asperger’s syndrome) is ranked the highest in the autistic spectrum because the symptoms are milder than other syndromes (Quill, 1995).

Nowadays, diagnostic criteria and classifications when referring to Asperger's Syndrome describe people with autistic disorders but with high functionality and with a borderline to normal intelligence index and language structure skills. Like many people with autism may have special abilities in certain areas (artistic, numeracy, general memorization, computers, etc.). One such example is the category "Enlarged Phenotype - Broader Phenotype". This category belongs to people with high intelligence, who exhibit certain "autistic" characteristics, which may not be obvious, difficult to identify, or considered to be character traits. family. Some place them on the autism spectrum in addition to Asperger's Syndrome, while others recognize another. Although autism have been officially recorded in 1943, there are very old

references to this disorder. Much has been written about autistic people with a high intelligence quotient that has contributed to the development of scientific evidences. The reason is for Einstein and Newton as admit the autism specialist Simon Baron-Cohen. It has been observed that we find a greater proportion of people with autism and a high rate of intelligence among mathematics, engineering, physics, and university teachers. Baron Cohen of the University of Cambridge and mathematician James of the University of Oxford evaluated the personality traits of Newton and Einstein to find out whether they exhibited the three main symptoms of Asperger's syndrome: stereotype interests, persistent occupation, social interaction and communication problems.

2. Definition of Autism

The term "Autism Spectrum Disorder (ASD)" is used in the literature as synonyms to describe a wide range of neurodevelopmental disorders that have three common characteristics: disturbed social interaction and interactive, interactive and interactive interaction limited and repetitive behavior patterns (Wetherby & Prizant, 2001). As the same researcher says, the term replaces the widely used "Autism Spectrum Disorder (ASD)". According to this condition, autism belongs to disorders that cause deficiencies in different areas of one's development, appear at an early developmental stage and in some cases are identified along with other disorders, such as mental disorders (Stasinos, 2013). The disorder occurs at a rate of 3-4 to 6 / 1,000 and is 4 times more common in boys than in girls. Four in five people with autism are male. It presents varying degrees of severity from person to person, may be mild, moderate or severe. About 10-20 people with autism have an average or above average intelligence, 10% have a mild mental retardation, while the majority of about 70% have severe mental retardation.

According to the DSM-IV, American Psychiatric Society (1994) and World Health Organization (ICD-10) taxonomic systems (1997), ASDs include a number of congenital disorders such as Autistic Disorder, Rett Disorder, Pediatric Disorganization, Asperger's Disorder, and Disseminated Developmental Disorder Unidentified (atypical Autism). Autistic disorder is considered to be the primary disorder, with the remaining disorders departing from this original pattern, varying both in severity of symptoms and in the number of affected areas of development. Sometimes, that is, there is only a partial manifestation of the disorder, and then

individuals do not exhibit the triple total of deviations associated with autism disorder (Lord eta al., 2000).

The creation of the DSM-V Mental Disorders Diagnostic and Statistical Manual was crucial, as all autism spectrum disorders were combined, having this common name (American Psychiatry Association, 2013). People with autistic spectrum disorder, on the one hand, has deficits in social communication with other people, and on the other hand, they have specific and minimal interests (American Psychiatry Association, 2013).

3. Causes of Autism

The causes and treatment of autism have been the subject of great research interest for decades. Scientists conclude that the disorder caused by autism is not the result of a single cause. Since the 1960s, valid scientific studies have shown the biological basis of autism and related disorders. In the last 20 years, the role of specific genetic factors in most cases has been recognized. Among the causes of autistic spectrum disorder are biological factors such as abnormalities, metabolic disorders and genes or even viruses that affect a person's biological system and are likely to be triggered even during pregnancy (Frith, 1989). Studies in twins have shown that the risk for autism and related disorders in siblings, that is, in genetically related individuals, is increased. Psychogenic causes, according to recent research, are ruled out as a causative factor and the hint of chromosomal abnormalities is still being studied. Disorders at the biological level directly affect both the cognitive and behavioral levels of the individual (Morton, & Frith, 1995). The following is a list of the most valid information on the causes of autism, and specifically for people suffering from its most severe form, Kanner Syndrome.

3.1 Organic causes

As organic causes is meaned the injuries that the fetus can suffer, some diseases that the individual's mother may have and biochemical factors. It has been repeatedly noted that autism is due to damage to the brain's connections, that is, to impaired central nervous system function due to severe, pre-, peri- and postnatal complications. Pre-born complications are considered to be mother’s illnesses e.g., infections (rubella) in the first trimester of her pregnancy (Wing, 1993), complications due to taking dangerous

medications and uterus bleeding during the 4th to 8th month of pregnancy in placenta and umbilical cord. According to research by Wing (2000), parents of autistic children have been found to be more likely to be exposed to chemicals or work as chemicals than parents of mentally retarded children. As regards to the perinatal period, that is, when the baby is born, autism can be caused by brain injuries and suffocation. Most of studies indicate that ASD students have more signs of brain dysfunction than do typical students and about the same number as mentally retarded students (DeMyer et al. 1981). However, these causes alone do not cause autism unless they are combined with biological agents.

3.1.1 Biochemical agents

Biochemical agents have not been researched so much that we can say they are definitely the cause of autism. They are due to disorders in the child's metabolism as well and disorders of the endocrine system. Some of the biochemical abnormalities that affect the baby after birth are phenylketonuria, serotonin and endorphin levels in the body.

3.1.2 Phenylketonuria

According to research in the field of autochemical biochemical agents that causes autism spectrum disorder, phenylketonuria has also been added (Baron-Cohen & Bolton, 1993; Kypriotakis, 1995). The effects of phenylketonuria can cause autism. People with phenylketonuria (hereditary disorder) have mental delay and epilepsy. This condition lacks an enzyme that is important for the normal use of proteins by the body. In their research, Baron and Cohen, referring to the effects of this disorder, say that the body does not break down the phenylalanine toxin and thus build toxins that damage the mind. One solution given by doctors is to have children with this gene diet.

3.1.3 Serotonin

Serotonin is a neurotransmitter; it transmits messages to the nerves of the brain through synapses (synaptic formation from the fetal phase and beyond depending on the stimuli each child has). High levels of serotonin have been found in the blood of autistic children, but it is being investigated to what extent it induces autism (Kypriotakis, 1995), as it is also observed in other mental retardation syndromes (Kakouros & Maniadaki, 2002). This link exists because serotonin affects the feeling of pain (autistic

children injure themselves without feeling are the pain), sexual behavior, movement, memory that occur at a reduced level in autistic people.

3.1.4 Endorphins

Endorphins are the 'drug' of the human brain because their role is that of endogenous morphine. They also affect the feeling of pain, after all because increased percentages of these neuropolipeptides result in a condition similar to that of morphine users. In addition, the decrease in endorphins, as well as in morphine, results in anxiety, screams, and irritability, behaviors that are mostly related to autism syndrome (Kalat, 2001). In Ćurin's et al. (2003) study, the levels of endorphin in the autistic brain compared to normal children showed higher levels of autism.

3.1.5 Chromosomal abnormalities

The process required to determine the exact causes of autism is lengthy and time consuming. Many of the surveys do not yield results due to the small amount of the sample or because there are other types of damage to the brain and it is difficult to clarify. As mentioned above, there is a hereditary predisposition that plays a key role in the autistic syndrome. Research at the University of California (Los Angeles) has found a number of hereditary traits in some families with autistic children. As the characteristic of blue eyes is hereditary, so the autistic features are hereditary too, e.g. anger attacks (Grandin& Scariano, 1995). Autistic children's siblings sometimes have these symptoms, but others such as language and mental disorders, distancing, shyness, and self-centeredness (Wing, 2000). This rate is only 2%, but is much higher than 1 in 2500 people in the general population (Rutter, 1990). However, is not a single gene responsible for autism, but many combined genes and their association with biological agents, which have to do with abnormalities in parts of the brain. According to most scientists and authors dealing with autism, chromosomal abnormalities do not affect its appearance, but it is confused because many children with Down syndrome develop autism symptoms (Kypriotaki & Markodimitraki, 2018). Also, some autistic children present with "fragile X" syndrome in which boys have physical deformities, mental impairment, speech deficiency, non-visual contact and echolalia. According to Scuse (2000) who investigate gender differences in autism. this syndrome is more prevalent in boys because although girls have two 'X' chromosomes and boys have one of their

own mothers, what they get from their father seems to protect them by replacing the other's defect.

3.2 Biological causes

The biological causes include the damage and malformations observed in the brain of autistic individuals compared to normal individuals. Once again it is emphasized that after necropsies (Baron-Cohen & Bolton, 1993) it has been observed that there are no specific brain abnormalities observed only in autism.

The major abnormalities occur in the cerebral lobes at the back of our left ear. In a magnetic resonance imaging done by Courchesne et al. (1988) in eighteen high-functioning autistic children, he showed structural abnormalities in autistic individuals with cerebral palsy. Specifically, it appeared that the upper posterior portion (lobes VI and VIII) of the cerebellum was abnormally small in fourteen of the eighteen individuals, while the adjacent lobes I to V, which are separated from the preceding ones, are of regular size. The smaller lobes are responsible for coordination, balance and rapid identification by the eyes. Deborah et al. (1984) pointed out that defective brain development can vary greatly from case to case and that there may be malfunction in various parts of an autistic brain. What is certain is that these failures are not visible on the lower networks until the higher networks understand their functions. According to Damasio and Maurer (1978), there are complications in the temporal lobe segments, which include branching of the dopamine system. The defective function of that part of the brain has effects such as inexpressible face and persistence in a subject. Also, one of the major problems of autists is the difficulty of processing acoustic information (Edelson, 2004). They hear the words, but they do not understand their meaning, they just hear sounds. This is because the audio information is not transferred from the hippocampus (learning area) in the center of long-term memory. Constantarea (2001) reports that the ocular movements of children with autism during sleep look like those much younger in normal children, which demonstrates divergent and immature brain activity.

3.3 Psychogenic causes

In our days psychogenic factors are excluded from the set of causes of autistic syndrome. In older societies, the lack of affection from mother to child, an unwanted pregnancy with anger or sadness crises or even lack of one parent were thoughts of developing autism. Kypriotakis (1995) gives a possible view on this prevailing opinion

claiming that the first studies on autism syndrome coincide with the evolution of psychoanalytic theory early 20th century, Freud, so it was it is reasonable to first consider the causes of autism as psychogenic.

4. Basic forms of autism

The first scientist to deal with Autism and publish the first systematic study was child psychologist Leo Kanner who is refered in Harris' article (2018). He observed that the acquired inability to relate to people, their lack of language development, their persistence and stereotyped behavior were the reason that kept autistics out of coexistence with the environment in a way common to the rest of us. He called this condition "early infant autism" (Kanner, 1943) because symptoms appeared from infancy. Childhood autism as mentioned in the preceding paragraph is a developmental disorder that occurs before the child's 3 years of age and has the characteristic of abnormal functionality and abnormal or even abnormal development in at least one of the following areas:

i. social transaction

ii. language as used in social communication

iii. symbolic game

This disorder is mainly present in boys three to four times more than girls (ICD-10, 1992). To make the diagnosis, developmental abnormalities must have occurred before the age of 3, although the syndrome can be diagnosed at any age. The diagnostic criteria are detailed in the following paragraph. As mentioned above, an individual in order to be characterized as autistic must have a set of six or more objects from 1, 2 and 3, with at least two of 1 and one of 2 and 3:

1. Qualitative deviation in social interaction, as manifested by at least two

from the following:

i. a manifest derogation to the use of many non-verbal behaviors, such as gazing contact, facial expression, posture and gestures to regulate it social transaction

ii. inability to develop at a developmental level similar to that of peers

iii. lack of spontaneous participation in enjoyments, interests or achievements with others people (e.g. with an inability to point out, raise or highlight issues of interest-shower)

iv. lack of social or emotional reciprocity

2. Quality derogation in communication, as expressed in at least one of the following:

below:

i. delay, or complete lack of development of the spoken language (which does not is accompanied by an attempt to replenish through alternative ways of contacting speech, such as gestures or imitation)

ii. in people with sufficient speech, a clear derogation from the ability to start or continue;

have a conversation with others

iii. stereotypical and repetitive use of language or use of idiosyncratic language

iv. lack of variety, spontaneous role-playing or social imitation, depending on

with the developmental level

3. Limited, repetitive and stereotyped behavioral patterns of interests

and activities, as manifested by at least one of the following:

i. limited engagement with one or more stereotypes and limited types;

of interest, which is abnormal either in tension or in focus

ii. apparently rigid adherence to specific non-functional habits or rituals

iii. stereotyped and repetitive kinetic manners (e.g. strokes or twists;

hands or fingers or complex movements of the whole body)

iv. persistent dealing with parts of objects

Among the spectrum recognized by ICD 10, there is great variability. Every person with autism has their own personal characteristics. The same skill can vary between

children and the same child, from age to age. Because of this variability and the difficulty of separating the problems of social interaction, communication, and stereotypical obsessive-compulsive behaviors, it is preferable to use specific tools and tools that control autism symptomatology (Howlin, 1998). From clinical experience, it has been observed that individuals most often have a combination of autistic characteristics and relatively rarely all the features of a syndrome are encountered as such. It is more useful to categorize by skill level than by based on theoretical categorization into subgroups. In addition, features found in case studies of people with autism spectrum disorder are the maintenance of a stereotyped set of movements and repetitive behavior that is often not quickly perceived by parents. In addition, there is a lack of humor and imagination, coupled with the diminished tendency for creativity mentioned earlier. Intense reactions are common, as well as aggression of the person with this disorder in cases of change or cancellation of his / her program (Stasinos, 2013). Of course, the appearance of co-morbidity also causes difficulties in the course of one's learning, as is the emergence of mental retardation (Stasinos, 2013). Furthermore, it has been observed the child's tendency for symbolic play, which is associated with both a lack of imagination and deficits in cognitive and behavioral levels, such as understanding one another's behavior (Herreraet al., 2008). Also important is the emphasis on the implementation of social play, as it can improve as a child both the social skills of the child and his or her language and mental skills. With regard to the information above, there is also research showing that the person, with appropriate intervention, is more interested in the game and takes more initiative (Tsamitrou & Agaliotis, 2010).

People with this disorder face problems in self-management and self-service, that is, in the ability to handle simple situations, such as cleanliness. As individuals often lack self-control skills, intervention is needed to improve both self-management ability and the ability to generalize certain skills across a broad range of situations (Gena et al., 2014).

5. Symptoms of Autism

Symptoms of autism can vary both in intensity and manifestation, and in the behavior of the person with autism we can distinguish from minimal to very many autistic

characteristics (Wing, 2000, Gena 2002). Factors such as mental capacity and level of speech have a significant influence on the form, intensity and frequency of symptoms. Also, the features of autism do not remain constant over the time, but evolve, due to the development of child, the environmental effects, social experience and education received by the individual.

According to Laushey and Heflin (2000) the core impairments in social behavior should be viewed as the defining feature of ASD. People with autism show a lack of interest in other people, do not seek out and even avoid contact and interaction with both adult and peer children. Specifically, these individuals are lacking in interaction initiatives but also lack of responsiveness to peer or adult social interaction initiatives (Loveland & Tunali-Kotoski, 2005). Most of people with autism are indifferent and often panicked by the presence of other children, while neither playing nor interested in developing friendly relationships with their peers. It is interesting that even when their interest in others is sometimes increased, these people find it difficult to acquire basic social skills (Carter et al., 2005). Children who are deficient in social skills have no the behavioral characteristics that are necessary to interact with others according to social convention. This deficit can affect both academic and social development. For these children, social skills deficits can affect interactions with family, peers, and other adults. Afterwards, limited social abilities can affect their ability to achieve normal developmental milestones and establish satisfying peer and familial relationships (Krasny et al., 2003).

6. Assessment and Diagnosis of Autism

The psychological and clinical evaluation of children with autism are necessary in order to have a complete picture of their strengths and weaknesses. The evaluation starts with a history taking from the child's parents in order to gather information on the child's developmental stages, early concerns and the course of the disorder. Then, assesses the child's developmental level, the intelligence quotient and behavioral characteristics of the child in “adaptive behavior” in the daily life.

At this point it is worth referring to the DSM - V. Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition (DSM - V), updated in May 2013 and is a universal diagnostic authority. in the field of psychiatry. The DSM - V is the new version of the DSM - IV and includes significant changes to the diagnostic criteria. Typically, in the

revised version the number of diagnoses described is significantly higher (541 vs. 383). Also, the term "Autistic Spectrum Disorder" has replaced the term "Diffuse Developmental Disorders" and represents those individuals who have common symptoms. In addition, Autistic Spectrum Disorder is a diagnostic category consisting of certain subcategories that have been incorporated into this term. The subcategories now include Social Communication Disorder, with Asperger's Syndrome, Autism and Diffuse Developmental Disorder eliminated - not specified otherwise. Social Communication Disorder refers to individuals who have deficits in their social relationships but do not exhibit stereotypical and repetitive behaviors (American Psychiatry Association, 2013). According to the American Psychiatry Association (2013), people with autism spectrum disorder, according to the DSM - V, have common features and symptoms divided into two groups. Typically, the first group refers to deficits in social interaction and communication in general, while the second group relates to stereotyped and repetitive movements, but also to the limited number of interests and functions. Also, the severity of manifestation of symptoms is divided into three subcategories and accompanied by relevant indicators. After all, all children with certain characteristics of the disorder belong to a large group called the autistic spectrum disorder (American Psychiatry Association, 2013).

According to the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*), a guide created by the American Psychiatric Association used to diagnose mental disorders, people with ASD have the characteristics of Table 1.

Table 1.
Diagnostic and Statistical Manual of Mental Disorders (DSM-5)

A. Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive, see text):
1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
2. Deficits in nonverbal communicative behaviors used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body

language or deficits in understanding and use of gestures; to a total lack of facial expressions and nonverbal communication.

3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behavior to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.

B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):

1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).

2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g, strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interest).

4. Hyper- or hyperreactivity to sensory input or unusual interests in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

Specify current severity: Severity is based on social communication impairments and restricted, repetitive patterns of behavior. (See table below.)

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

Note: Individuals with a well-established DSM-IV diagnosis of autistic disorder, Asperger's disorder, or pervasive developmental disorder not otherwise specified should be given the diagnosis of autism spectrum disorder. Individuals who have marked deficits in social communication, but whose symptoms do not otherwise meet criteria for autism spectrum disorder, should be evaluated for social (pragmatic) communication disorder.

Specify if:

- With or without accompanying intellectual impairment
- With or without accompanying language impairment
- Associated with a known medical or genetic condition or environmental factor (Coding note: Use additional code to identify the associated medical or genetic condition.)
- Associated with another neurodevelopmental, mental, or behavioral disorder (Coding note: Use additional code[s] to identify the associated neurodevelopmental, mental, or behavioral disorder[s].)
- With catatonia

CHAPTER II- TREATMENT AND INTERVENTIONS

1. Basic principles of Treatment

The National Research Council (2001) of the United States of America, has outlined some of the basic principles underlying any therapeutic approach program for people with autism. These principles are as follows:

1. Therapeutic intervention should be based on individualized and specialized programs with specific teaching objectives in all areas of development. The Individualized Educational Program must take into account the different needs and abilities of each child and the needs of their family. The curriculum of the child's activities and educational environment, inside and outside the classroom, must be appropriately tailored and strictly structured to enable the Personalized Curriculum to be implemented as best as possible, as well as in a more systematic way.
2. Intervention should begin immediately after the diagnosis of autism disorder because early intervention is a crucial factor in the diagnosis of the person with autism.
3. Every program in order for any program to be effective, must be implemented for at least 25 hours a week and throughout the calendar year, not just the school year.
4. At the start of treatment, especially for very young children, repeated teaching opportunities should be provided throughout the day, with each treatment session should initially be relatively short (about 15-20′ per session).
5. Education should be conducted individually or in very small groups of children with a relevant developmental level. Ideally, the child-therapist ratio should be 1: 1 and definitely does not exceed 1: 2.
6. All members of the family, with parents in a co-therapeutic role, should be actively involved in the therapeutic process. At the same time, family counseling and support should be provided in order to get the help they need to cope well with the difficulties of raising a child with autism.
7. The child's progress should be reviewed regularly and regularly, with a view to reforming the Individualized Education Program and thereby teaching the

child with autism, according to their constantly changing needs. Lack of progress for long periods (3 months or more) signals the need for more intensive intervention, achieved either by reducing the therapist / pupil ratio or by increasing the hours of special education and treatment.

8. Staff should be evaluated and supervised, with the child's progress in mind. Staff should be highly trained and skilled in use psychoeducational methods especially for children with autism.
9. Children with autism should receive support from suitably trained staff so they can integrate into mainstream and extracurricular activities with their typically developing peers, where there are many opportunities for interaction with them. The goals of inclusion, of course, should not be abolished, but compatible with the child's Individualized Education Program.
10. Priority should be given to teaching spontaneous and functional communication, social interaction, play skills (especially with peers), and cognitive skills during intervention. At the same time, strategies for dealing with problem behavior need to be implemented, such as the strategy of functional behavior analysis. In general, it should be borne in mind that the acquisition of new skills is crucial to reducing behavioral problems. Finally, depending on the needs of the child, school-based skills of functional value should be taught. Emphasis should be placed on the generalization and maintenance of new skills in the child's natural environment (e.g. at home and at school).

Behavioral curriculums follow all the principles associated with the treatment of children with autism and emphasize the basic principle that all children have the opportunity to learn and be promoted cognitively, emotionally and socially, as long as their teaching and treatment are properly managed. Lack of progress is analyzed as inappropriate treatment and not as a weakness of the child. With intensive and appropriate treatment, children with autism have immediate and noticeable improvement. Also, the extent of improvement depends on the child's potential. (Gena, 2002).

2. The Intervention Settings

The intervention setting can't be predetermined, but it is defined by the needs of each child and his/her family. Depending on the age, interests and needs of the child, intervention can be done at home, in special education centers, at school, or even in other places such as shops, playgrounds and elsewhere.

2.1 Home-based programs

Home-based treatment programs are treatment programs that provide the of education at the child's home and is usually conducted by a group of therapists who are hired and supervised by parents, or by parents or professionals (Harris et al., 2005). The UCLA University Early Intervention Program ("Young Autism Project at UCLA"), initiated by Ivar Lovaas, is the most well-known home treatment program. This program is led by specialist behavior analysis professionals who are also responsible for supervising the therapists hired by parents for home treatment. Intervention, initially, involves a personalized and individualized treatment program, approximately 40 hours per week. Then, depending on the progress and needs of each child, their transition to a school setting, either special or regular, is planned with the ultimate goal of integrating them into the mainstream school (Lovaas, 2003). Homeschooling programs have significant advantages as the child gains valuable teaching time by avoiding travel while parents acquire useful therapeutic skills and are able to attend their child's program at any time (Handleman et al., 2007).

2.2 Intervention programs in special centers

Behavioral analytical intervention is often performed in specialized autism day care centers. Families, in this case, are also educated in intervention and are expected to provide supportive intervention at home and in the community, usually with the aim of generalizing and preserving the child's skills as well as teaching self-service skills, but under the supervision of specialized professionals. The aim of most daily programs is to integrate children into regular classes where their typical peer developmental students are attending.

Daily intervention programs in special centers are the most common and preferred parent intervention for children with autism. All staff members are specialized in the

treatment of autism, and all the necessary staff, such as psychologists, special educators, speech therapists, etc. are concentrated in the same area, so that the child does not waste time to move to different areas. The most important advantage of special centers is that they don't have gaps in teaching due to absences or changes in therapists, as often happens in programs organized at home or in public schools.

2.3 School intervention

There are three cases for children with autism attending school:

i. study in special classes exclusively for children with autism who are within public school

ii. to study in a special class for children with all kinds of disorders

iii. be integrated into the class with the presence of special staff supporting the autistic student.

In all three cases where intervention is made at school, parents are still expected to support the program at home. School attendance differs markedly from attending centers specializing in the treatment of autism (Harris et al., 2005).

The most important advantage of school interventions is that allow the child to enjoy the benefits of natural school setting. Also, they include opportunities for social interaction among autistic students with the typical peers when playing, eating or exercising. In addition, children with autism have the opportunity to become accustomed to the routine of a regular classroom (eg morning prayer, raise their hand to participate in the lesson, sit in their seat, etc.), and gain important skills that promote their school and social integration.

However, special support forms are not usually available for the child and their family in the public school, such as parent education and home counseling, or an individual child education program, which may be crucial for the child's evolution. Finally, the satisfactory intervention program at school may depend on the presence of a special teacher responsible for adapting the child to school and the absence of this teacher may

create various problems in the conduct of the program or even cancel its validity (Harris et al., 2005).

Summarizing the data, it is important to refer that although the intervention setting may play a role in the therapeutic outcome, it is certainly not a determining factor. The quality and intensity of the intervention, the age of the child at the beginning of the intervention, and the active involvement of the family are some of the most important factors in the development of the child with autism.

3. The structured behavioral analytical approach

Until the 1960s, children with autism were considered to have no improvement in learning and behavioral levels. Ivar Lovaas and his colleagues were among the first to oppose this view by developing a systematic intervention program based on behavioral analytical techniques that were found to be particularly effective in obtaining a large number of desired reactions (Olley, 2005). The structured behavioral programs, which developed then, are influenced by the research and clinical active developed by Lovaas, and other behavior analysts, such as Krantz & McClannahan and others.

Behavioral interventions focus on the systematic teaching of small, measurable units of behavior. Each behavior is broken down into smaller steps, which are taught in a specific way by providing various forms of part-time help when the student is not responding adequately. Special attention is given to repeated mass trials, until the child expresses the target reaction without the help of the therapist. In this way, the gain of new reactions and skills is accelerated. Also, the consistency of guidance, setting, time, and the therapists involved in the teaching process, helps to maintain the effects of intervention (Green, 1996; Lovaas, 2003). Each child's reaction is followed by consequences which, when viewed as reinforcement, tend to increase the likelihood of enhanced reaction in the future.

The teaching techniques utilized in behavioral treatment is: The Systematic Teaching Cycle, which consists of five steps:

1. the child's attention

2. the presentation of the distinctive stimulus by the therapist

3. the child's reaction

4. the positive or negative results depending on the reaction

5. the time between the efforts of systematic teaching.

However, systematic teaching is not the only behavioral teaching technique. Techniques, such as activity schedules (eg. Krantz & McClannahan, 1993, MacDuff et al., 1993; McClannahan & Krantz, 1999), model observation through video technology (e.g. Gena et al., 2005. Charlop-Christy & Freeman, 2000, Taylor et al. 1999), Social Stories (eg Del Valle et al., 2001), the Alternative Picture Communication Program, PECS, (Frost & Bondy, 1994, Charlop-Christy al., 2002), as well as a number of other methodological and programmatic interventions, have proven particularly effective in the treatment of autism.

All behavioral programs aimed at reducing inappropriate behavior, enhancing the child's mimetic abilities, obeying the therapist's commands and discreet learning, careful observation and diversification of various behaviors, from the beginning of intervention. As the child obtain the basic skills, will teach more advanced developmental skills, such as play, social interaction, oral speech, observational learning, autonomy, as well as motor, preschool, school skills, and skills. self - service and entertainment (Lovaas, 2003; Olley, 2005). Also, some higher-level skills such as emotion expression, problem solving, theory of mind, and so on will be viewed from the perspective of Applied Behavior Analysis (Gena et al., 1996; Schreibman & Ingersoll, 2005).

4. The factors of effective intervention

Many behavioral analytics researches focus on the factors that help us predict the effectiveness of intervention. We can discern the predictors in three categories. To those related

i. with the child ii. with the intervention

iii. with the family

There is no absolute agreement on how important each predictor is, but the importance of all the factors that are mentioned below, with particular emphasis on factors such as the child's intelligence (Eikeseth et al., 2002) and the type of intervention (Smith, Groen et al., 2000).

The key predictors can be summarized, by category, as follows:

Child-Related Factors:

1. Child intelligence before the intervention (Eikeseth et al., 2002, Bibby et al., 2002, Harris & Handleman, 2000, Sallows & Graupner, 2005). Children with higher levels of intelligence, as seen in all relevant studies, take the greatest benefits from this intervention. For example, in the research by Harris and Handleman (2000), 48 Chapter 3 Treatment and Education of People with Autism children with IQ On average, before the intervention, there was an improvement in this measurement by 26 points after the intervention, and were more likely to fit into the regular order. Similarly, children with IQ 46 on average, while improving IM, but lower (13 points on average) than children with higher intelligence, and they could not attend regular school, so they continued to need special education. In general, it is argued that the Transcript of children with autism before intervention, should be 50 or higher in order for the forecast to be particularly positive (Eikeseth et al., 2002).

2. The age starting the treatment. When intervention begins before the age of 5, and more specifically between 2-4 years, there are expected benefits to the intelligence and the likelihood of inclusion of the child (Bibby et al., 2002. Fenske et al., 1985, Harris & Handleman, 2000, Luiselli et al., 2000, Green, 1996, Schreibman, 2000).

3. The child's pre-intervention skills in areas such as imitation, reason, self-service, sociability (Sallows & Graupner, 2005) and play (Schreibman & Winter, 2003). Especially the level of the child's speech before intervention is a crucial factor. If the child has developed an oral (even audible) speech before the age of 5, then the prognosis is better (Lewkowicz & Hansen-Tift, 2012). Beglinger and Smith (2005) found that children with autism who were classified as distant (according to Wing's criteria) showed significantly less improvement

in intelligence after intervention (behavioral analysis) than did children. the children, who fall into the other two groups of children (passive and active but idiosyncratic).

4. The speed at which a child obtains new skills (mainly imitation and speech) during the first 3 months of intervention, but also after treatment (Sallows et Graupner, 2005, Smith et al., 2000, Weiss, 1999).

   The factors associated with the intervention are:

   i. The duration of intervention is related to performance in the communicative, cognitive and social-emotional domain (Luiselli et al., 2000). We get better results when the intervention lasts at least 2-3 years (Green, 1996).

   ii. The intensity of intervention (Lovaas, 1987, Sheinkopf et Siegal, 1998, Howard et al., 2005, Smith, Groen, et al., 2000). The intensity relates to the number of hours of intervention and in the therapist-child ratio. It has been found to work best when intervention lasts at least 25-30 hours per week, with the child-therapist ratio being 1: 1 (Green, 1996). In the relevant studies, it was found that intensive intervention was better than less intensive intervention, which is usually implemented within the school. Specifically, groups of children who received more intensive and longer intervention had 16-30 points higher IQ from the control groups, i.e., groups that received less intensive and shorter intervention (Lovaas, 1987, Sheinkopf et Siegal, 1998, Smith, Groen, et al., 2000). In addition, more intensive interventions also significantly reduce the symptomatology of autism (Sheinkopf et Siegal, 1998). However, the intensity and duration of the intervention are characteristics that make it difficult to conduct research similar to UCLA's original and much-discussed research (Lovaas, 1987). In addition, the conditions dictating a behavioral intervention program are difficult to obtain in state-funded programs (Smith, Groen, et al., 2000; Boyd & Corley, 2001), although there are exceptions, such as the program. of Princeton Child Development Institute (McClannahan & Krantz, 1994).

iii. The appropriate selection of intervention techniques, depending on the skills taught. Intervention techniques should be selected according to the skills taught. For example, for toilet training the Azrin and Fox program is still considered the most effective, whereas for teaching communication initiatives, in-house teaching is more preferable than the McGee Systematic Cycle (McGee & Daly, 2007). Finally, as noted in the literature, the Systematic Teaching Cycle is more appropriate for acquiring a child's initial skills with autism than teaching key skills (Shreibman & Winter, 2003).

CHAPTER III- SOCIAL INTERACTION IN ASD

1. Social Skills

According to the literature, a general definition of social skills is the emergence of "specific behaviors that lead to positive social interaction" that are related to both verbal and non-verbal reactions that will lead the person to develop communication (Rao et al., 2007). In the literature, of course, the difficulty of formulating a definitive definition of social skills is emphasized, as it is a multi-factor phenomenon, and the personality, age and gender of the individual, language and social environment, intelligence play an important role. and the cultural setting of individual (Merrell, & Gimpel, 1998). However, from the above definition one can understand that the absence of social skills implies that the person cannot interact positively with others in their environment, which is directly related to the offending behavior but also to the child's low academic performance (McClelland et al., 2000).

A key feature of social skills is their distinction between observable behaviors and those that are not easy to detect. In any case, their acquisition helps the individual to manage situations well and adapt to new circumstances and circumstances (Elksnin, 1998).

Michelson et al. (1983) advocated the following views on social skills. Specifically, they point out that these can be acquired through education, utilizing the methods of observing imitation and feedback. Second, social skills are related to both verbal and nonverbal communication. In addition, an integral part of social skills is the effective integration into groups as well as the manifestation of appropriate reactions. The fourth view relates to the fact that the acquisition of social skills is linked to the reinforcement of positive response from the community as a whole. Furthermore, they appear to enable individuals to interact effectively with the environment.

Finally, it is possible to identify a person's deficiencies in social skills, thereby enabling them to intervene directly and improve social behavior (Elliot et al., 1989).

2. Forms of Social Skills

Social skills take a variety of forms. Specifically, as Apteslis et al. (2012), report, they relate to the following traits: proximity, whether the individual chooses to be close to

others during specific activities and the eye contact, the ability of the individual to distinguish characteristics of or the activities of people near his / her environment and respond to the eyes of others. In addition, they relate to parallel activity, the ability of the individual to work either in a group or on his own, but without disturbing those in his environment, as well as social responsiveness, responsiveness to rules of conduct and general instructions.

In addition, social skills are also associated with social initiative, spontaneous initiative, order rotation which refers to the ability to wait in line without derogating or disturbing others, the rules which meaning the accepting or applying new rules for new situations and reciprocity and sharing, which refers to on the one hand the tolerance for interrupting an activity or the patience to complete it and on the other the choice to share objects with others and at the same time respect the objects of others. Finally, they are related to adapting to changes, whether they involve a program or a space layout (Apteslis et al., 2012)

In addition, Riggio (1986) makes a further distinction between social skills, which distinguish them in emotional expression and emotional sensitivity.

All social skills are related to how the individual communicates with others and their environment. Acquiring them also involves developing specific aspects of personality, such as developing empathy, negotiating ability, offering help, generosity, and problem-solving abilities (Lynch & Simpson, 2010). The tools and methods for assessing social skills are the TEACCH program and other tools such as the Autism Social Skills Profile developed by Bellini and Hopf (2007). According to Simpson (2005), the TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children) program is a structured curriculum that incorporates changes and interventions in the learning environment, visual stimuli, and creates a daily individual program designed to meet the educational needs of children with autism spectrum disorder and improve their communication. The program created in the 1970s by Eric Schopler at the University of North Carolina's School of Psychiatry, which was succeeded by psychologist Gary Mesibov. Its main features are related to personalized teaching and the creation of a well-structured physical environment. In the TEACCH program, autistic spectrum disorder is treated as a different "culture", where people share common behaviors and interests (Mesibov et

al., 2005). Finally, several studies refer to the SSIS (Social) Skills Improvement System), which can monitor individuals throughout their school life. This program assesses both the social skills of people with autism spectrum disorder, their academic performance, and their behavior (Elliott & Gresham, 2008).

2.1 Proximity

Proximity refers to the ability to interact positively. A general definition can be "the interpersonal distance that individuals maintain when they have developed an interaction" (Hargie et al., 1994). The absence of this particular social skill implies social isolation and the inability to participate in discussions, but also the inability to understand nonverbal behavior, such as the body movements of other people (Rozelle et al., 1997). More specifically, proximity is related to whether the child responds positively or negatively to physical contact, touching other people, and to whether he or she chooses is close to others during specific activities. Developing this skill requires specific interventions that will improve a person's ability to interact with their surroundings and decrease a passive attitude towards contact and communication with other people (Apteslis et al, 2012). The "passive proximity" is directly related to the choice of minimum contact, physical or visual, with individuals in the same group or with significant individuals, such as the mother. From this definition it seems that proximity is directly related to another social skill, that of visual contact (Laushey, & Heflin, 2000).

2.2 Eye contact

Eye contact is a form of non-verbal communication that provide the person with information about each other's intentions. In addition, the orientation of the eye toward something or someone highlights elements relevant to the individual's interest, so predicting the next movement becomes feasible (Phillips et al., 1992). Disturbances in eye contact control are either hasty visual contact with objects or individuals in space, persistent observation of specific elements, and avoidance of responding to facial expressions as well as inability to understand them (Myers & Johnson, 2007).

2.3 Group Activity

This social skill, as mentioned earlier, relates to one's participation in group activities and the use of objects in space. With this skill, the individual is a functional part of the team and does not isolate or cause problems or annoy other members during activities. The development of the capacity for parallel activity must take place simultaneously

with the development of the two previous social skills, with the aim of learning a set of elements that will lead to the effective integration of the individual into a group as well as the development of positive interaction with its members.

In the absence of this social skill, the child may adopt a range of behaviors while he or she is with other classmates. It may not deal with the objects in the space at all, but it does appear to be isolated from the rest. In addition, the child can play with objects in the space, which are different from those used by his classmates, while not showing interest in playing with his peers' toys. Also, the child may join the group but not interact with its members, remaining a mere spectator of the game. Lastly, he may be in the team playing the same games, but not interacting directly with other members, simply by playing close to his peers and not with them. The development of this skill helps the child to join the group smoothly, share objects and engage in activities without being able at an early stage, to support a specific role. Gradually, it becomes an organic part of the group and learns to work with other members (Gena et al., 2007).

3. Language

Social responsiveness is directly related to eye contact, and the ability to respond to rules and instructions is added. Thus, as in the first case, the individual must direct his or her gaze to each individual, whether adult or peer, or unknown. In the latter case, the child must respond to prompts or gestures, be able to imitate others and have an immediate response when requested for assistance or contribution to an activity (Apteslis et al, 2012). In addition, developing social responsiveness skills means that the person is able to shake hands, respond to a greeting, and be willing to participate in activities on their own. In addition, it is characteristic of the ability to respond to and comment on a particular event, which requires the person's uninterrupted attention to it (Weiss, 1999). It should also be emphasized that it is not just about developing the skill, but also applying it at the right time. One method that can enhance this skill is to imitate individuals in their environment. However, this process should not be a mere memorization of specific movements and responses, but an essential understanding of the reactions that should occur in specific situations. In this way, one gains experience in manifesting one's particular skills, which can lead to spontaneous responses to specific movements and behaviors of others (Weiss & Harris, 2001). Therefore, the

importance and necessity of a unified education becomes evident, which will be discussed below.

3.1 Communication

Autism is characterized by difficulties in social and language development. The social difficulties of ASD children have an impact on their language development and linguistic difficulties impact in socialization because is linked to language development (Nordgren, 2016). Linguistic abilities are highly heterogeneous in children with autism as there is variability in language development and a variety of phenotypes (Wilkinson & Murphy, 2016). According to Benítez-Burraco & Murphy (2016), one-third of children with autism have morphological and syntactic problems. Wittke et al. (2017), classify people with autism into three groups according to their level of language difficulty: People with relatively normal language development, people with speech difficulties but relatively good vocabulary, and people with low language skills.

Language disorders in the autism spectrum can be distinguished as follows:

3.2 Phonological processing

Phonology in children with autism is an area that has been poorly studied. However, it is an important area as it develops from infancy as hearing affects speech production quantitatively and qualitatively Nordgren (2016). Although there is a significant delay in speech in children with autism, phonological development follows the course of typically developing children. According to Kambouroglou and Papantoniou (2003), the accent and height of autistic children 's speech are peculiar.

3.3 Vocabulary, Syntax and Semantics

In recent years, research has suggested that the development of language in autistic people is deficient not only in functional use but also in grammar-syntax. (Terzi et al. 2014). Structural dysfunctions in autism include difficulties in understanding questions and in the passive use of language (Perovic & Janke, 2013, Perovic et al., 2007, Wilkinson & Murphy, 2016). Children with autism have a particular difficulty in using and handling specific language types such as articles, pronouns, intentions, and verbs because they do not understand their semantics (Kambouroglou & Papantoniou, 2003). Children with autism have difficulties in expressing their everyday experiences using language and therefore have limited semantic development (Kambouroglou & Papantoniou, 2003). According to Wilkinson & Murphy (2016), they receive different

semantic information that is integrated in a different way than other people. In addition, semantic deficits persist in adolescence even in functional individuals with autism who over time improve some of their difficulties.

3.4 Functional use of language

It is well known that the main deficit of autistic children in speech is the functional use of language. Indeed, in the case of children whose level of syntactic and semantic is high, real use of language can be a deficit. Usually, children with autism are not interested in dialogue, but also when they do, they constantly jump from one topic to another without any connection or meaning. Also, they are unable to understand the metaphorical use of language and intentions, motivations, perceptions, and goals of other people in discussion. In addition, they have difficulties in oral speech and often leads them to bursts of anger and vigorous agitation in order to convey the message they want (Vogindroukas, 2005). Finally, their speech is monotonous, full of echoes, and their voice can be inappropriate in tone or color (Baron-Cohen, 1993). The difficulties of autistic children in the functional use of language have obvious consequences on the school profile of child. The speech, thinking, and social, emotional and cognitive development are connected, so any difficulty in one area affects others at the same time.

3.5 Gestures

Deficits in gestures are one of the criteria for diagnosing autism (DSM V). Specifically, autistic children show a significant decrease in the index gestures as well as the interdependence between speech production and gesture usage (Nordgren, 2016). Also, according to Nordgren, (2016), children with autism have an audiovisual impairment in the integration of sounds, expressions and gestures, and these deficits lead to delayed social development as it begins with the knowledge of facial expressions, understanding intentions, interaction and focus of attention.

The difficulties of children with verbal autism are essentially related to communication difficulties such as not responding to dialogue, their tendency to perceive only the literal meaning of words, deficits in a discussion. According to Vogindroukas (2005), people with autism may want interaction and communication, but only within their means. Specifically, surveys conducted in the natural communication environment has shown that the odd behaviors of people with autism are ways of expressing and seeking out

communication and social intent. (Vogindroukas, 2005, Prizant & Rydell 1984, Shapiro 1977).

4. Inclusion

The development of policies and strategies for the inclusion of students with special educational needs in mainstream schools has been a concern for the European education community since the 1980s. According to the principles of the European Commission, inclusion is "inclusive education". It provides an important basis for ensuring equality of opportunity for people with disabilities and flexible education systems that meet the diverse needs of these students.

4.1 A model of inclusive intervention

In the 21st century schools are characterized by the diversity of their students. Students differ in race, religion, nationality but there are also students with special educational needs or disabilities. For this reason, inclusive education is a particular challenge for schools that should provide equal opportunities to all their students. Of course, in order to achieve this, it is necessary to involve teachers, who are the most critical factor in inclusive education as they are called to implement it.

In the past few years, the inclusion of children with autism has become prevalent because of the increasing number of children diagnosed with autism but also because of the complex clinical picture that children with autism present (Gena, 2006). Also, the number of students with autism attending mainstream schools in inclusive settings has increased. This fact shows that students with autism are no longer the exception in general schools, and teachers may have one or more of these students in their classes each year. (Roberts & Webster, 2020).

According to Lynch and Irvine (2009) there is some debate as to which characteristics needs an inclusive classroom and many of the attempts to describe these models are informative and can assist educators and researchers in better understanding this elusive construct. Lipsky and Gartner (1996) described the essential elements of inclusion. They describe seven essential elements that can be used to develop and guide an inclusive education programme in USA. These elements were visionary leadership, collaboration, refocused use of assessment, support for staff and students, funding, effective parental involvement, and curricular adaptation and effective instructional

practices. In addition, in order to develop inclusive learning, needs to think it as a process aimed at acquiring students' competences and not just as learning lessons (Council, 2002). Halvorsen & Neary (2009) reinforce this view by arguing that inclusion is an attempt by students with disabilities to attend school with their friends and neighbors and receive specially designed teaching and support. However, it is necessary to emphasize that inclusion is not only the education of these students in a general classroom, but also social and emotional education coupled with the motivation of the students. Thus, for students with autism, the goal is to integrate not only learning but also socially within the classroom and interact with their classmates by developing relationships. (Webster, 2016).

The effectiveness of inclusive education relies upon factors that make it difficult to implement it properly. Specifically, according to Lindsay (2007), the following issues arise: (a) regarding the definition and interpretation of the idea, since the categorization of the child with special educational difficulties and the degree of severity of these difficulties are disputed by some people, (b) issues related to distinction of categories of special educational needs (c) issues identified with changes in the idea of school education such as the fact that "inclusion" can no longer be interpreted as something contrary to "separateness". (d) by the practical and operational use of specialized educational support. (e) the effectiveness of the educational process.

4.2 Teachers' attitude about inclusion

Educational professionals are crucial to successfully implement inclusive education (Van Der Steen et al., 2020). The severity of the disorder is a significant factor for the acceptance of a student with special needs in their classroom.

According to some researches teachers in general education has a lack of knowledge about educating students with ASD (Simpson et al. 2003, Westling, 2010, De Boer et al., 2011). According to Shaddock, (2006) the main obstacles that teachers encounter when applying inclusive education are: lack of time, difficulty in individualizing the program within the classroom, lack of education and resources, lack of support from school and the general view of many teachers that by adapting a program for helping specific students, it may affect the standard advancement on students without disabilities. More specifically, teachers don’t feel confident when teaching these students and according to Lindsay et al., (2014) it seems a difficult task for them. In the

Greek education, according to Zoniou-Sideri & Vlachou (2006), even though all teachers said that they would accept a child with disabilities in their classroom, they would prefer to choose a different class that would include students from different cultural, ethnic, linguistic, religious groups rather than students with disabilities. Also, although most of teachers argued that children with disabilities can be educated in the general school, at the same time, stated that their education in the special school would be better for them. In addition, they consider special education teachers more suitable for the education of children with special educational needs (Erdem, 2017). According to Webster (2016), leadership is a key factor in inclusive schools and one of the most important factors in inclusive programs, is the belief of school leaders that students with autism can learn and achieve in the school setting with the appropriate support.

According to Van Der Steen et al. (2020) research on the challenges, attitudes and teaching strategies of general education professionals who teach students with ASD emphasize the collaboration with staff and parents, ongoing training, appropriate classroom management and didactic strategies, the appropriate school policy for ASD students, and ways to improve the social acceptance from typical peers. Even though is widespred the needs of students with ASD in inclusive education, the research on the needs of their teachers is limited (Van Der Steen et al., 2020; Able, et al., 2015). Most of studies concerned with educators in general school have focused on their attitudes (Avramidis et al., 2000), teaching strategies (Florian & Black-Hawkins, 2011) and the challenges they experience (De Boer et al., 2011; Van der Worp-Van der Kamp et al., 2013, Westling, 2010). The academic development depends on the individualized programs (Lynch & Irvine, 2009) because the heterogeneity in the population of ASD makes it hard for the general teachers to find the diverse needs of the students (Breitenbach et al., 2013).

On the other hand, parents of children with disabilities who are integrated into mainstream schools, argued that their children play better and are more socially favored by typically developing peers (Handleman et al., 2005). However, Greek parents are disappointed as concerned the effort to integrate their children with disabilities into mainstream schools, because of the difficulties they face, in the absence of appropriate support and required schooling (Zoniou-Sideri, 1998).

4.3 Inclusive programs in Greece

Inclusive education in Greece is an issue that poses many challenges as it will bring critical changes in Greek society (Soulis et al., 2016). The implementation of inclusive education in Greece is predicted in accordance with Law 4115/2013. This law specifies that the special education unit of Primary and Secondary education is an official unit of the EAE and the school units that make it up comprise the School Education and Support Network (ΣΔΕΥ). Each "ΣΔΕΥ" points (a) to advance participation, (b) to coordinate the work of school units, and to empower them to respond to the special educational needs of students, c) the support of the integration departments (TE), the equal help co-training and the students who receive home teaching.

4.4 Student's attitude about inclusion

Researchers generally agree that the attitude of peers of children with disabilities should be worked on and taken into account in the implementation of inclusive education in general education schools. The social acceptance of children with special needs by children attending general schools is a very important factor for the success of inclusive education. According to a study (Gash, 1993) girls express greater social interest compared to boys. Regarding the application of inclusion, students were aware of the consequences of using negative behaviors and characterizations on a student with special needs. In another study (Magiati et al., 2002), in which students expressed attitudes and views about disability, most children had a positive attitude and were receptive to coexisting in the classroom with a student with a disability.

As concerned the Greek schools, which was conducted in primary schools, proves that primary school students had less positive attitudes towards students with special needs. In particular, it seemed that the students were possessed by feelings of fear and realized that students with disabilities do not have the same abilities as themselves. In any case, they don't appear to be possessed by empathy for their classmates with disabilities as they feel that they do not feel lonely or subordinate. A notable fact of the study was that the girls also developed more positive attitudes regarding the issue of inclusion of students with disabilities as well as students of lower school grades. However, in another study by Kalyva & Agaliotis (2009), the gender of general school students was not a factor in different attitudes about inclusive education and most of the students expressed positive attitudes towards inclusion.

Many researches show that students with autism are not successfully be integrated and participate in school setting (White et al. 2009, MacNeil et al., 2009) and teachers often feel unskillful stressed and anxious about the need of an ASD student in their classrooms (Roberts & Simpson, 2016). According to a survey by the Hellenic Statistical Authority (Elstat, 2023), the students attending elementary Greek general education schools are 621.298 total. Since the proportion of ASD children worldwide is 6 per 1000 children, we assume that almost 0.006 * 621.298 = 3.728 children attending Greek schools belong to the autism spectrum disorder.

Students with ASD often show difficulties in cognitive ability (Ashburner et al., 2010), in the use of higher-level language and impaired executive functions such as focus and sustain their attention, to manage their time effectively, and to monitor or correct themselves (Liss et al., 2001, Rosenthal et al., 2013). Also, they often experience difficulties with play, forming and maintaining peer relationships. Children with autism spectrum disorders Research has demonstrated that these social difficulties persist into adolescence and young adulthood (Schall & McDonough, 2010). More specifically, usually have difficulty with components of play, like turn taking, changing activities, reduced symbolic quality, and giving the control of preferred play activities (Kent et al 2019). In addition, according to American Psychiatric Association, (2013) students with ASD may show social communication difficulties that can cause social isolation, self-injury, stereotypic behaviours and emotional sensitivity (Cappadocia et al., 2012). Other difficulty is the likelihood to be bullied that is increased in ASD students than either typically developing (TD) students (van Roekel et al., 2009). Also, they show difficulties in play, forming and maintain social relationships (Kent et al., 2019) and according to Schall and McDonough (2010) they last until adolescence.

For this reason, according to Roberts and Simpson (2016), the characteristics of autism disorder are a challenge for both students and school which often struggle to support their needs.

5. Advantages of Inclusion in Children with Autism

The most important benefits of integrating children with autism into general schools are in the area of social development (Handleman et al., 2005). More specifically, the opportunities to build friendly relationships with their peers and the possibility to adopt

acceptable behavior patterns exhibited by their typically developing peers contribute to more profitable social behavior for ASD students in general than in special settings (Koegel et al., 2001). Also, there are important benefits from integrating children with autism acquired by their typical development peers who are involved in the implementation of the integration program (Handleman et al., 2005). In particular, the involvement of typical students in the inclusive program helps to develop more positive attitudes towards their classmates with special needs and in overall attitude about inclusion (Gena & Kymissis, 2001; Harrower & Dunlap, 2001 Kamps et al., 1998).

6. Individualized Inclusive Programs

There are different theoretical positions regarding the inclusion of children with autism in the mainstream school that help in the creation of inclusive programs with different philosophy and practices. Most of these programs believe in the importance of personalized education in the need of special context, peer modeling, and the advantages that peer modeling can bring to the ASD student in general school (Handleman et al., 2005). According to Odom et al. (2011), the successful inclusion should involve active intervention to promote engagement, social participation and child development.

The development of a personalized inclusive program requires qualitative and quantitative analysis of the behavior not only of children with autism in the classroom but also of their typical developmental peers (Gena, 2001, 2002). According to Handleman et al. (2005) the students with autism should be included first in a personalized program in a specific context and then based on their skills to the framework that will fit. For example, high-functioning children, with a good level in language and cognitive skills, can be fully participate into the classroom and educated along with their typical development peers but there is a likelihood to need some special support in order to improve their social skills. Other children with autism may join the classroom for a few hours a day and then return to more specialized contexts, such as an integrated class in the general school, and specialized early intervention centers. Children with the most severe disorders may need to continue study in special settings like special schools and associate with their typical peers in another settings like parks, playgrounds or cafeteria (Handleman et al, 2005).

Interventions that promote the inclusion of autistic children into school can be classified as: direct adult teaching, peer mediation, and active child with autism.

6.1 Direct Teaching

According to Gena (2002), in direct teaching, the educational conditions are formulated only by the teacher. The teacher teaches directly the desired behaviors and enhances their expression (Krantz & McClannahan, 1998).

According to Harrower and Dunlap (2001), inclusion of children with autism is promoted when they are provided with priming. In priming, the student should be prepared for an upcoming activity or event which sometimes is not pleasant for him/her. This can occur in a friendly for the child setting (e.g., class, home) and it's better to incorporate in the kid's routine. In the inclusive setting, priming is used to familiarize the child with autism in school life activities and in social interaction with peers, in order to successful response to the demands of the school setting (Harrower & Dunlap, 2001).

It is often necessary to provide partial assistance when integrating children with autism. Part-time help, in the form of verbal guidance and presentation of a role model, has been successfully implemented in the education of children with autism integrated into mainstream schools (Gena, 2006). In addition, partial guidance in the form of verbal help and presentation of a role to imitate, has been successfully implemented in the education of children with autism integrated in general schools (Gena, 2006). These programs are a form of visual stimulus guidance that has been successfully applied to facilitate in the transition from one lesson to another or from one activity to another. Other forms of visual aids, which have been effectively implemented to teach social skills to children with autism, include the video modeling, the use of scripts and the use of social stories.

It has also been found that often rewards guarantee can improve school experiences of students. On the other hand, according to Krantz and McClannahan, (1998), students who are not frequently take rewards pay less attention to their teachers and do not have strong motivation to participate in classroom activities. An important element in the school environment is descriptive verbal praise, that is, praise that includes both expressive acceptance of the behavior and the description of the particular behavior that

is rewarded. The use of interventional techniques, such as support and social reinforcement from the therapist, are necessary for the development of social skills.

As concerned the role of the general education teacher in integrating children with special needs it could be supportive and his intervention in the interaction of children needs to be discreet. Also, it is needed special training in the techniques of integrating and managing problem behavior (Handleman et al., 2005). In addition, the presence of a well-educated Parallel Support Teacher who can provide only the support needed to the student with autism in the general school is a key factor in order to successfully response to school needs (Gena, 2006). The Parallel Support Teacher must provide only the necessary help, can withdraw gradually and systematically must be specially trained (Gena, 2002).

6.2 Peer Mediated Interventions

Peer Mediated Intervention is a range of strategies that considered a successful support in social-communication behavior for kids. It is considered particularly effective the knowledge of typical peers about difficulties and abilities of their peers with autism, because with the appropriate reinforcement and guidance it can be developed the appropriate strategies to facilitate their interaction. (Owen-DeSchryver et al., 2008).

Several different approaches to interventions have been developed to address impaired social interactions and play in children with ASD. These different approaches include coaching the child with ASD, identifying and addressing individual play skills and interests, and developing supportive relationships and environments. Typically developing classmates are important role models for imitation of desirable social and communicative behaviors. In particular, in PMI (Peer Mediated Intervention) the typical peers play an active role in helping their peer with autism. The training include ways to help and encourage their classmate with autism and learn him/her ways to develop social game skills such as sharing and swapping. In some cases typical developmental students are trained to provide help, support, and feedback to their peers with autism (Weiss & Harris, 2001). By receiving general instructions on how to insist on interaction, the autistic student participate in activities that this student is involved in, use simple language, enhance their effort, and invite the adult special teacher-therapist, when is needed (Handleman et al., 2005). In some other cases PMI interventions include the training of typical development peers to interact with their peers with special needs (Laushey & Heflin, 2000). The most common processes in this

category of intervention are social skills groups (Kamps et al., 1992; Chung et al., 2007; Owen De-Schryver 2008; Licciardello et al. 2008) and peer buddy approaches (eg Laushey & Heflin, 2000; Kohler, 2007; Morrier, 2018). The social skills groups involve small groups of students, including children with and without special needs who practice in the social skill which the teacher present to them. The teacher guide and support the students when they needed. In the Buddy approach the children are separated into pairs and trained to play and talk to their "buddy ".

Peer-based strategies promote the development of more natural and socially more valid forms of social behavior, compared to direct teaching, where therapists usually teach specific reactions (Laushey & Heflin, 2000). There is constant research demonstrating the effectiveness of this approach for increasing social interactions and academic engagement for students with autism spectrum disorder in school settings (Bene et al, 2014; Chang & Locke, 2016; Watkins et al., 2015; Brain & Mirenda, 2019). According to Chan et al. (2009), PMI is a socially valid and practical method for social skill development and suits in school and other settings as café, playgrounds etc. Peer mediated interventions may also be used to target multiple skills at once (Pierce & Schreibman, 1995). Some of the benefits of PMI for children with ASD include among others the increasing duration of interactions with peers and increasing frequency and quality of social initiations and responses (Chan et al., 2009; Zhang & Wheeler, 2011).

6.3 Active role of student-Self-Management

Self-management programs can be designed and implemented by the individual in total or may require at least to some degree of involvement by the individual. In the first case, we could assume that the individual has achieved an ideal degree of self-control but in the second case the individual will manage part of his/ her behavior. Self-management is more effective in improving the desired behavior than in reducing undesired behavior. The students with ASD are taught to see the difference between appropriate and inappropriate social behaviors and reward themselves when they adopt the appropriate behavior (Harrower & Dunlap, 2001). The younger than 7 years children’s behavior shows the greatest improvement and children with autism or attention deficit/hyperactivity disorder benefit more from self-management (Gilboa & Helmer, 2020).

In Morrison et al. (2001) study, students with autism self-monitor their social interaction skills while playing games with peers. The results showed that ASD students increased their peer initiations and responses and decreased their inappropriate behavior as a function of the intervention. According to Mitchem et al. (2001), self-management programs involve some combination of two or more of the following strategies: self monitoring (including self-assessment and self-recording), self-evaluation (including decision-making and goal-setting), and self-reinforcement for goal attainment. Koegel (1992) noted that the factors that make self-management a promising strategy. Firstly, promote the independence for children with autism, can generalize the results in several natural settings and can be taught in a short time with quick results at the same time.

To sum up, self-manage procedures can treat the lack of social responsivity in autistic child and at the same time doesn't require a full presence of teacher in the children's natural settings. Self-management strategies cannot be effective in every student and need a lot of time and training but it seems that have some good perspectives. Even though the self-management strategies have potentials, studies addressing their efficacy in children with autism are limited.

7. Evaluation of interventions

According to Odom et al. (2011), the successful inclusion should involve active intervention to promote engagement, social participation and child development.

The direct teaching technic has proved an effective approach in development of transitioning skills from one activity to another, from one classroom to another and to maintaining a new behavior (Sainato et al., 1987). Also, the support from a teacher in autistic children with the target skill of social initiative while simultaneously suggesting to peers to respond, helps to increasing not only the responses, but the initiatives that receive as well as a longer interaction (Odom & Strain, 1986).

As for the self-management strategy, it has proven that helps students to control their behavior and don't depend on parent and teachers prompts and at the same time to generalize the new skill in natural settings (Galanis, 2018, Lee et al., 2007, Koegel et al., 1999). Also, by using these strategies, students engage in more time, decrease less disruptive behaviors and creates a more positive environment in the classroom (Reid,

1996). Also, when the child has acquired self-management skills and doesn't need any teacher guidance can have more chances to interact with peers and avoid stigmatization (Harrower & Dunlap, 2001). This permits teachers to spend more time on learning process rather than behavior management of student with autism (Galanis, 2018). In addition, educating children with autism to self-manage their social interactions with their peers can generalize these skills to new conditions, in peers who are not aware of the integration program (Handleman et al., 2005).Finally, self-management needs much less direct contact with the Parallel Support Teacher makes this ideal for the classroom environment, community and home.

Peer-based strategies promote the development of more natural and socially more valid forms of social behavior, compared to direct teaching, where therapists usually teach specific reactions (Laushey, 2000). Also, in this strategy, generalization does not need to be planned (Rogers, 2000), peers act as "intervention agents" and as a result this reduces the requirements from the school staff (Chan et al., 2009). PMI have been proven effective in developing social interaction skills with typically developing peers (Handleman et al., 2005) and peers can benefit from better understanding the diversity of autism and with moral satisfaction from the help they offer (Kamp et al., 1998). There is constant research demonstrating the effectiveness of this approach for increasing social interactions and academic engagement for students with autism spectrum disorder in school settings (Bene et al., 2014; Chang & Locke, 2016; Watkins et al., 2015, Brain & Mirenda, 2019). According to Chan et al. (2009), PMI is a socially valid and practical method for social skill development and suits in school and other settings as café, playgrounds etc. Peer mediated interventions may also be used to target multiple skills at once (Pierce & Schreibman, 1995). In addition, they reduce the need for continued support from an adult (Rogers, 2000. Weiss & Harris, 2001), they are economical in their application and conditional on promoting the generalization of new skills (Gena, 2006, Kamps et al., 2002, Rogers, 2000).

There have been a small number of reviews which summarized and evaluated PMI interventions (see Chan & Locke, 2016; Wang & Spillane, 2009; Watkins et al., 2015; Martinez et al. 2019; Whalon et al., 2015; Chapin et al 2018). Wang and Spillane exacted a metaanalysis in order to examine the effective social skills interventions in children with ASD, Chan et al. summarized all PMI studies of the years 2008-2009 and argued that PMIs may be quite different from study to study, particularly in the targeted

skill sets (i.e., academic skills, disruptive behaviors, social skills). Some years later, Watkins et al. (2015) focused on the intervention characteristics and components. Chang and Locke (2016) in their review focused on the quality of the PMIs by examining studies that have used experimental group designs for all school age children with ASD that targeted social skills. In a previous review of school-based interventions, Bellini et al. (2007) conducted a meta-analysis of single case design studies investigating the impact of school-based interventions on the social skills of children with ASD. Also, Whalon (2015) conducted a systematic literature review of single case design school-based interventions that facilitate the peer-related social interaction of children with ASD. Lastly, Martinez (2019) conducted a more specific systematic review with the outcomes of single-case research design studies that have implemented peer-mediated interventions to address the social competence of young children with ASD (3 to 8 years old). All studies have shown that PMI has beneficial effects in the social interaction of children with autism. However, these reviews have focused in young children with ASD and does not cover all the school ages. Also, there are few studies that explored qualitative measures of interaction between children with and without special needs, which is being developed with peer-based approaches. In addition, this strategy is complex in implementation, because require an adequate number of typically developing peers, with good social skills, willing to participate and can be sometimes annoying and tiring for typical developmental students (McGee et al., 2007).

All in all, the severity of difficulties that face the students with autism disorder and the challenge that the teachers face require the best possible understanding of these techniques in order to ensure their accurately and consistently application. Interventions aimed at developing key skills for successfully integrating children with autism in general school should combine all three key techniques in the accession process. Specifically, it is important to combine adult support, peer-to-peer interaction, and a well-prepared for inclusive settings child with autism (Handleman et al., 2005). According to Odom et al. (2011), the successful inclusion should involve active intervention to promote engagement, social participation and child development.

CHAPTER IV – METAANALYSIS STUDY

Recent research has shown that children with autism spectrum disorder (ASD) attending primary school face a variety of difficulties in their social integration across the school context. According to the fifth edition of the diagnostic and statistical manual of mental disorders (DSM-5) the key characteristics of ASD are deficits in social communication and interaction combined with restricted and repetitive behaviors, interests, and activities (American Psychiatric Association, 2013). Students with autism often try to interact with others in their own way and that leads to miss opportunities for socialization. Several studies indicated that students with ASD have low friendships (Bauminger & Kasari, 2000), weak conversation capacity and low social engagement (Koegel et al., 2008). According to the National Research Council (2001) students with ASD should be taught skills in the natural settings in which they would be utilized.

These characteristics can become more intense in playground activities with other same age children. Specifically, their social communication deficits, may lead to difficulties between the ASD students and their teacher or classmates' relationship. Also, their restricted and repetitive interests may affect both academic achievement and social relationships (Watkins, 2014) and the challenging behaviors that some students show may disturb the inclusion in general classroom. These deficits may harm the child's quality of life (Gifford-Smith & Brownell, 2003). For this reason, effective intervention is required at an early age in order to prevent lifelong harms of ASD (Aldabas, 2019). The opportunity of education in children with autism spectrum disorder is a big challenge for the educational community. The challenge is based on the complexity of the nature of disorder and the special features like socialization, communication and creative imagination deficit. For this reason, there is a need for evidence-based interventions that helps ASD student to have significant gains in inclusive settings. (Watkins, 2019).

In order to improve the outcomes for children with ASD much research has been focused on developing effective methods for inclusion of ASD children in natural settings with the most popular interventions those based in peer engagement. Typically developing classmates are important role models for imitation and have desirable social and communicative behaviors. In particular, in PMI (Peer Mediated Intervention) the typical peers play an active role in helping their peer with autism. Social interaction

with peers has an impact on a person's development during childhood and affects in academic, social and emotional success and in general personal life (Medina et al., 2016, Reichow et al., 2013).

The last decade, have published several reviews investigating Peer Mediated Interventions for students with ASD in inclusive settings. (Aldabas, 2020; Martinez, 2019; Chapin, 2018; Ramos et al., 2018; Zagona, 2018; Chang and Locke, 2016; Ezzamel and Bond 2016; Watkins 2015; Whalon 2015; Trottier 2011; Sperry 2010; Chan, 2009). Some of them analyzing the characteristics of effective PMI and the social outcomes (Martinez et al., 2019; Ramos et al., 2018; Watkins et al., 2015; Chan et al., 2009,) and some other evaluate only the effectiveness of PMI (Aldabas, 2020; Ezzamel and Bond 2016).

Although there are many review studies that have demonstrated the effectiveness of social skills in social interactions of ASD children with their TD peers, there is a need for additional research in most recent studies published in the last decade. Even though, reviews on the topic of social skills interventions have typically focused on how they can improve the social interaction of ASD children with their typical peers (White 2009, Watkins 2014, Chang 2016), there is a need to know how peer-intervention studies have targeted communication abilities in this population. Moreover, previous studies have indicated that future research should include not only quantity, but quality data too in the field of peer mediated intervention (Chang, 2016, Licciardello 2008, Owen-DeSchryver 2008). Owen-DeSchryver consider that there is a need of better analyze the qualitative changes in social interactions by using a data collection system that allows measurement of changes in the duration of interactions or in some aspects of student behavior. According to Licciardello, future researches should analyze the quality of peer interactions with measure the duration of interactive play, with percentage of social exchanges that included conversation and the kind of activities that are associated more frequently with reciprocal responding. However, less is known about how literature in the field has explored the added value of different quantitative and qualitative measurements, and specifically regarding the measurement of communication abilities. This evidence motivates to investigate with a meta-analysis study how peer-intervention studies have implemented qualitative and quantitative data to assess the impact of social interventions.

Previous meta-analysis studies focusing in peer-intervention have focused on investigating the effectiveness of peer-interventions. Chang & Locke (2016) summarizes the observed social outcomes, focuses on generalization, sustainment, implementation fidelity, and discusses the clinical implications of these studies in school settings and Watkins (2014) review focused on the intervention characteristics and strategies. Wang et al, (2009) meta-analysis examined social skills studies with single- subject designs and found PMIs to be highly effective for children with ASD .

Therefore, the purpose of this meta-analysis is to (a) summarize the characteristics of the interventions (b) explore the abilities which have implemented in PMI studies, (c) analyzing study differences by controlling the quality of the design and (d) provide recommendations for practice and future research.

1. Method

A search was conducted using the PsycINFO, Education Resources Information Center (ERIC), using the terms: *autism, autism spectrum disorder, ASD, Asperger, social skills, social behavior, social development, conversational skills, peer mediated interventions, PMI, preschool, elementary.* The search was restricted to English language PMI studies published between 2007 through 2019 and in order to identify relevant studies that could be missed by electronic search, were conducted search in references of included articles that was potentially relevant for inclusion. Also, research of review and meta-analysis studies conducted in order to identify further studies to consider for inclusion in this study. Finally, a total of 15 articles met the criteria for inclusion in this meta-analysis.

2. Inclusion criteria

Before the search of literature, the criteria for inclusion in this study were developed. The inclusion criteria were: (1) All participants must have ASD diagnosis (2) Including children 4–13 years old (3) Studies conducted exclusively in inclusive settings Inclusive settings defined as the settings in which the student with ASD shared the context and activities with typically developing children (Watkins et al., 2015) (4) Studies using experimental research design that allowed for direct analysis of the effect of the intervention.

(5) Studies must use outcome measures that targeted social-communication skills (6) Studies assessed the effectiveness of social skill interventions (7) Studies with empirical, intervention-based investigation published the last 15 years.

From 75 articles examined for inclusion in the search process 12 excluded. This occurred because 4 of them didn't focus only in ASD children but in children with several disabilities, 2 of them didn't report information about the participant characteristics and 7 did not take place in inclusive setting.

3. Data extraction

Each study analyzed across the following categories: (1) participant characteristics (number, gender, age, ethnicity, and functioning level), (2) description of target behaviors and skills (3) description of intervention (4) research design (5) Duration (6) intervention results including intervention, maintenance, generalization effects, treatment fidelity and inter-rater ability. We focus only in studies that included an experimental design because they evaluated as evidence based.

The functioning level of participants has been reported according to author's references or specified by IQ scores determined the estimation f participants' cognitive level. According to the schema provided by Reichow and Volkmar (2010), participants categorized as lower functioning have limited or no verbal language skills and an IQ 55. Participants categorized at a moderate functioning level typically had basic verbal communication skills and an IQ of 55 to 85. Participants categorized as high functioning typically were described as having high-functioning autism or Asperger's Syndrome and had well developed verbal communication with an IQ 85 and above.

4. Intervention Effectiveness

For single case design studies, there are reported two non-parametric effect sizes which provide visual analysis of intervention results of each study, the PND and IRD indicators. PND (Scruggs et al. 1987) includes the percent of nonoverlapping data and IRD (Parker, Vannest, & Brown, 2009) includes improvement rate difference. They calculated in order to determine the degree of overlap among baseline and treatment phase. There are meta-analyses in the field (e.g Wang & Spillane, 2009; Schlosser &

Wendt, 2008) that used PND as the effect size metric and others (e.g., Ganz et al., 2012) used IRD as the effect size metric. Chen et al., (2016) has highlighted the high correlation between PND and IRD indicators and provided evidence that results may be comparable in terms of quantifying effect size

The percent of non-overlapping data (PND) calculated by counting the number of treatment data points that exceed from the upper of baseline data point and this number divided by the total number of treatment phase data points to determine the PND. Scruggs and colleagues suggested the the ranges for the interpretation of PND scores: 0–50 % ineffective, 50–70 % questionable, 70–90 % effective and 90 % or greater very effective (Scruggs and Mastropieri, 1998). According to Maggin et al. (2011) the percentage of nonoverlapping data (PND) is the most frequently used treatment effect score appearing in 55 % of the 84 effect sizes garnered from 68 literature syntheses. Scruggs and Mastropieri also provided suggestions for interpreting the PND results (1998). They suggested that PND scores above 90 represented highly effective treatments, scores from 70 to 90 represented effective treatments, scores from 50 to 70 were questionable, and scores below 50 were ineffective.

The IRD is characterized as the difference in improvement rates between baseline and intervention phases where an improved data point in baseline is unexpectedly large (i.e., overlapping with treatment's data). The improved data point in intervention phase is above all baseline phase data (nonoverlapping). For the calculation of IRD, all overlapping data points between baseline and intervention are considered either improved or unimproved, by finding the smallest number of data points that may be removed in order to eliminate all data overlap between phases (Parker et al., 2009). The maximum IRD score is 1.00 (100%) and this show an effective intervention. A large or very large treatment effect occurs when all intervention phase scores exceed all or almost all baseline scores and are around .70 or .75 or higher. The scored that are around .50 to .70 indicate moderate effects and scores below 0.50 considered small questionable effects. (Maggin, Cook & Cook, 2019; Parker et al., 2009). According to Parker et al., (2009). A negative IRD score is possible and indicate deterioration below baseline levels (Parker et al., 2009). IRD is an effect size with distinct advantages over other effect sizes currently available because of it's a) accessible interpretation b) simple hand calculation c) compatibility with PND from visual analysis; d) known sampling distribution for confidence intervals; e) proven track record (as "risk

difference") in medical studies, and (f) high to moderate correlations with other effect sizes g) application to complex single-case research designs and multiple data series. All these information are included in Table 2 below.

Table 2.
Method and Research-design

Reference	Participants	Setting	Target Behavior	Procedure	Research Design
Banda, Hart and Liu-Gitz (2010)	2 male participants (6-year-old) Diagnosis: speech impairment and PDD-NOS[3] 2 to3 typical peers per participant Moderate functioning	classroom	social initiations and responses	Teaching simultaneously peers and ASD children through direct instruction modeling, reinforcement, prompting, fading) to improve social initiations and responses	multiple-baseline across participants
Brain & Mirenda (2019)	3 (M) participants with ASD (11,12,13 years old), Ethnicity: Chinese-Canadian Diagnosis: Autism 9 peer coaches Low functioning (1) High functioning (2)	classroom	Engagement and communicative acts	Training peers in strategies named DO, HELP, and TALK using description, model, role play and feedback.	multiple-baseline across participants

[3] PDD-NOS: Pervasive Developmental Disorder-Not Otherwise Specified

Chung, Reavis, Mosconi, Drewry, Matthews and Tasse (2007)	4 male ASD children 6,7,7,6 years old and 3 peers. Diagnosis: Autism and pervasive developmental disorder	Play room	Appropriate-inappropriate talking	Teaching peers how to prompt the target children using the new skill, encourage them and praise them. Use of role plays with peers and adults to understand the process.	basic comparison design
Ganz & Flores (2008)	Two play groups each with four children (2 male 4 years old and 2 TD and 1 male ASD and 2 TD 3-6 years old) Diagnosis: Autism and PDD-NOS Ethnicity: Hispanic and Caucacian High functioning	Play room in private school	script or unscripted phrases responses and comments, intervals with speech	Script training: Participants taught to use scripted phrases for different play themes; trained to use visual instruction cards to initiate with participants during play; peers modeled play behaviors for participants; adults used least to most prompting for participant use of scripted phrases	changing criterion single-subject design
Harper, Symon and Frea (2007)	Two males with autism 8-9 years old and Six 3rd grade TD students	classroom and recess	number of attempts at gaining attention of peers, number	Triads were developed with two peers and one target child with autism; Use of visual training	Concurrent multiple baseline design across participants

	Ethnicity: Vietnamese		of turn-taking and initiations to play	cards and cue cards and role playing for check if peers understand the new strategies.	
Katz & Girolametto (2015)	3 ASD children (2 male and 1 female) 4-5 years old and 9 peers High functioning	classroom	Responding and initiations	The researcher read a storybook, and gave to each child opportunity to re-enact the story using puppets.; Teaching strategies to initiate and respond and used them to a communication board; pairing of the child with ASD with a trained peer.	multiple baseline single-subject across participant and subject
Koegel, Vernol, Koegel and Paullin (2012)	2 males, 1 female; 9, 10, and 12 years Old and 6 to 10 peers per participant High functioning Ethnicity: Euro-American and Hispanic	camp, cafeteria, and schoolyard	Social Engagement and initiations	Engagement and peers participated in school clubs' activities which created based on participant's interests	multiple baseline across-participants
Kohler, Greteman, Raschke and	1 female child with ASD 4 years old and 6	classroom	peer social overtures and	Buddy skills intervention;	multiple-baseline

Highnam (2007)	peers (4 years old)		target child overtures	playgroups; peers taught "Stay, Play, and Talk" strategies; teacher used cue cards, prompts and praise to teach peers to interact with target child	across-subjects
Lee, Odom and Loftin (2007)	3 males ASD children With frequent stereotypic behavior & 12 TD children 8 to 10 years old Ethnicity: 2 Caucasian, 1 African Diagnosis: Autism	Classroom	Initiation, responses, stereotypic behavior, teacher prompts and motor behaviors	Peers taught to naturally respond and initiate with target children by analyzed steps in the natural setting using modeling, prompts, repeated trials and reinforcement	multiple baseline design across participants and settings
Loftin, Odom and Lantz (2008)	ASD children: 3 male children 9,10 years old Peers: Not mentioned High functioning Ethnicity: Not mentioned	Cafeteria	Social initiation, social interaction and repetitive motor behaviors	Peers taught to naturally reinforce social initiations from the child with autism; Target children taught to initiate to peers by using task analysis, modeling, repeated trials, prompts, and Reinforcement; Target children taught to self-manage the initiations and identify reinforcement	Multiple baseline design across participants

Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014)	3 male ASD children 6-7-8-year-old and 4-6 TD peers	Playground	number of communication acts	Peer training with direct social skills instruction; instructions of play skills; teacher prompt peers to initiate and to use visual cues or hand over-hand prompts to elicit an appropriate social response from participants during recess; teachers used reinforcement card for all children to talking, sharing, and playing appropriately	Multiple baseline single case design across participants
McCurdy & Cole (2014)	3 ASD males 7-8-11 years old and 3 peer supporters High functioning	classroom	Classroom behavior; off-task behavior and; Peer Opinion Questionnaire	Peers trained to identify on task behavior of target children and provide them feedback; Peers trained through modeling and role-play	Multiple-baseline design across participants
Owen-DeSchryver, Carr, Cale and Blakeley-Smith (2008)	2 male ASD and 1 male Asperger 7 and 10 years and 8 peers Moderate and High functioning	School cafe and recess	social initiations and responses	Peers were provided by a friendship rationale for students with disabilities; They discussed about a book or	multiple baseline design across participants

				participated in a circle-of-friends activity (depending of the age); General discussion with purpose to understand that all children have special abilities and needs; They trained in strategies to initiate and play with the target children; They use visual support of strategies during interaction with target children	
Rodriguez-Medina, Martín-Antón, Carbonero and Overjero (2016)	1 male Asperger child 8 years old and 16 peers High functioning	Classroom	initiation, response, challenging interactions, time that he is alone and time he interacts and inadequately	Peers provided a combination of strategies of peer initiation, reinforcement, and proximity which include direct instruction, modeling, and social reinforcement; In recess time they practice the proposed skills and interview with a classmate and the peer who pair with the target student	single-case design

Schmidt and Stichter (2012)	3 males; 12 and 13 years Old high functioning	Classroom and cafeteria	appropriate and inappropriate initiations, responses, and continuations directed toward peers	Peers trained in strategies such as direct instruction, modeling and role play and strategies for reinforcement; Peers participated in a social competence program which trained peers in recognition and expression of facial expressions, sharing ideas, turn taking in conversation, recognition feelings and emotions and solving problem.	multiple treatments design

After this information, the duration of sessions for each research separately is presented in Table 3 below.

Table 3.
Duration of sessions

Reference	Duration of sessions
Banda, Hart and Liu-Gitz (2010)	10 min and 4- to 5min before training frequency is not reported
Brain & Mirenda (2019)	10min x 28 sessions per activity
Chung, Reavis, Mosconi, Drewry, Matthews and Tasse (2007)	90min per week for 12 weeks
Ganz & Flores (2008)	30 min 4-5 days per week for 4-5 x per weeks, 4 weeks in total
Harper, Symon and Frea (2007)	20min x 7 sessions;10min x 3-4 sessions (generalization)
Jung, Sainato and Davis (2008)	5 x10 min sessions per day for 12-15

	15 weeks, M 35 sessions per participant
Katz & Girolametto (2015)	20 min 1 play session (baseline); 15min x 5 training session (children); 12 x 20-minute play sessions; 4 follow up sessions
Koegel, Vernol, Koegel and Paullin (2012)	15min per session frequency is not reported
Kohler, Greteman, Raschke and Highnam (2007)	10 min 3x week for 11 weeks
Lee, Odom and Loftin (2007)	4-6 sessions x10 min play session; 20 min x 5 training sessions; 10min generalization session 1 day per week
Loftin, Odom and Lantz (2008)	30 min, 5 x per week 7 weeks in total
Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014)	10 min, 3 x per week,13 sessions per participant
McCurdy & Cole (2014)	not reported
Owen-DeSchryver, Carr, Cale and Blakeley-Smith (2008)	30–35 min for 26 weeks total
Rodriguez-Medina, Martín-Antón, Carbonero and Overjero (2016)	20-40 min x14 sessions in 4 weeks; 10 sessions for 3weeks (maintenance)
Schmidt and Stichter (2012)	6 x 40min sessions per week for 12 weeks

5. ASD participants' characteristics

Collectively, the 16 studies provided intervention to a total of 40 ASD participants. The dominant gender of participants with ASD was male (n=37; 92%), with fewer female participants (n=3; 8%). This could be explained because of the frequency in appearance of disorder in boys. The majority of participants were in age ranging from 5 to 11 years old. Specifically, 31 students were in elementary school (n=31; 77%), and 9 in preschool (n=7 ;23%). Unfortunately, only 5(33%) of the 15 studies mention the ethnicity and culture of participants and most of the participants described as Caucasian, American, African, Vietnamese or Hispanic-Latino.

Regarding the level of functioning in ASD participants, 12 of 15 studies provide information about the functioning level of children or have been categorized based in criteria from Reichow and Volkmar., (2010). 27 participants described as high

functioning with developed social skills, 3 as moderate with basic social communication skills and 4 as low functioning level with limited or no verbal language skills. Two studies haven't provided data for the functional level of participants. From the 27 high functioning participants with ASD and from 3 moderate functioning participants as well as from 4 low functioning participants all were males.

The estimation of participants' functioning level was determined either by the author of the study or classified according to the schema provided from Reichow and Volkmar., (2010). The participants that belong to Asperger's Syndrome classified in the high functioning level even if the study didn't provide IQ data.

6. Target behaviors

According to Banda et al., (2010) the child should be able to demonstrate communicative intent when interacting with adults or peers. Most of analyzed studies which explore the social communication effects of a Peer Mediated Intervention program (PMI) use a general measurement based in children's communicative abilities. They explore the initiations, which defined as verbal interactions consisting of turn-taking questions or conversation and responses which defined as comments and responses in the questions made from a peer to the child with autism or from the ASD child to a peer. In some other studies, the authors use the term "communication acts" in order to explain the initiations and responding from the ASD child in peers or from peers to ASD child.

There was a range of target behaviors selected for intervention with PMI, with most of studies including more than one behavior. Target behaviors were reported as the social behaviors that studies targeted and measure. The most common target behavior was some form of social interaction initiations, responses to social initiation, communication and turn taking or sharing but there are also studies that focus on interventions targeting more complex behaviors. The 8 of 15 studies (53%) targeted social initiations and responses. Initiations defined as verbal or, gestural communication from the target children toward a peer and the response defined as any verbal or gestural behavior directed toward an initiating from target children to a peer. Even though two of the studies targeted in communicative acts (Brain & Mirenda, 2019 and Mason et al., 2014), this category defined as social initiations and responding from

a peer or to a peer from the target child so it can be categorized in these target behaviors. Some of the studies used a variety of dependent variables targeted both in initiation or response combined with other dependent variables such as receiving social bids, engage in playing, repetitive motor behaviors, time that ASD child is alone or interact, challenging interactions, stereotypic or motor behavior, gaining attention and number of turns taking interactions. Other studies targeted in social behaviors such as appropriate and inappropriate talk (Chung, 2009), prompt (Ganz, 2008; Jung, 2008), peer social overtures (Kohler, 2007), off-task behavior (McCurdy, 2013), challenging behavior (Medina, 2016) and social engagement (Koegel, 2012).

All in all, the main domain of target behaviors in PMI studies consisted of social communication skills. The most common behavior is initiation and responding in social interaction and in most cases meet it up with other target behaviors and are not the only measurement.

7. Setting

The setting category described the specific location in which peers implemented the intervention. All interventions took place in inclusive settings such as classroom, playground or schoolyard, cafeteria, playroom or a combination of these settings. Nine studies used the classroom setting (60%), two studies took place in a playground of school yard (13%), three in a cafeteria (20%) and two studies in play rooms (13%) and one study took place in a camp. Three studies used a combination of recess and cafeteria (Owen-DeSchryver et al., 2008), a combination of classroom and recess setting (Harper et al., 2007) as well a combination of camp, cafeteria and school yard (Koegel et. al., 2012). The identity of schools is not reported in all studies but from those who report it three studies took place in private and two in public schools.

8. Duration of sessions

Most studies (n 8) implemented a total intervention time of 4 to 6 h per participant, followed by 2 to 3 h (n 3) and 6 or more hours (n 1). Duration of intervention sessions ranged from 10 to 40 min per session and occurred from once a week to five times a week. In three studies the frequency of sessions was not reported while in another one study the duration of sessions is not referred. The treatment intensity of the rest of 14

studies reporting the duration and frequency of the intervention sessions varied significantly.

9. Research design

The majority of studies utilized a multiple baseline design (11 of 15 studies 73%). Ten of studies conducted across participants, two studies conducted across settings (and two across subjects. One study conducted across both participants and settings and another one study across participants and subjects. From the other four studies (27%), the first one used basic comparison design for each participant and another one used multiple treatment design. The rest two studies used a changing criterion single-subject design and single case design.

10. Procedure of intervention

All the studies implemented Peer-Mediated Intervention but the training strategies that researches use in order to teach peers vary and use more than one strategy. Actually, they combine several intervention types to create a specific treatment package. In PMI the peers trained directly peers how to initiate, communicate and interact with target participants by using some techniques. Most of studies follow visual support strategies by using prompt of intervention procedures, reinforcement for correct implementation and cue cards or pictures. These strategies included modeling, cue cards, scripts and book. Specifically, eight studies use prompt, four studies use reinforcement and five use cue cards or pictures. Also, most of the studies (7 of 15) use modeling in order to teach social or play behaviors, one study use scripts, five use role-play, three provided direct instruction feedback and two praise. In two studies (Owen-DeSchryver et al. 2008 and Katz & Girolametto, 2015) training of initiation and play occurs through a book that is discussed or with a circle of friend's activity but they use visual support strategies during interaction with target children and in one study peers trained to participate in activities based in ASD participant's interest (Koegel et al., 2012). Also, there is a study (Katz & Girolametto, 2015) in which teaching strategies (initiation and response) provided by using communication boards.

In some cases, the intervention sessions provided by some of the study authors or sometimes the authors trained teachers, school staff or peer interventionists to

implement the intervention in participants with ASD. For example, McCurdy & Cole, (2014) provided instructions to peer supporters and taught them how to prompt the desired behavior from ASD children. The Table below (Table 4) show us all these information.

Table 4.
Quality appraisal criteria

Reference	**Maintenance/Generalization**	**Treatment fidelity**	**Social Validity**	**Inter-rater Reliability/Agreement**
Banda, Hart and Liu-Gitz (2010)	Not reported	Not reported	Not reported	81%
Brain & Mirenda (2019)	1-4 week/ Results maintained with some decrease in level and increased variability No generalization probes	Baseline: 0% across all groups Interventions & follow-up for 3 participant's peer coaches: 95% (range 50-100%) 85% (56-100%) and 71% (44-80%)	questionnaires that completed from teachers and peers' coaches in the end of intervention phase. HIGH	95%
Chung, Reavis, Mosconi, Drewry, Matthews and Tasse (2007)	Not reported	Not reported	Not reported	86%
Ganz & Flores (2008)	4-5 days in 4 weeks Follow the same procedure with	Not reported	Not reported	baseline sessions: 92% intervention

	intervention but adult's prompts decreased			and generalization sessions:92%
Harper, Symon and Frea (2007)	Ten-minute generalization probes for 4–5 sessions; No prompts or directions to use the PRT strategies	Data ranged g from 78%-100%	Examined through anecdotal/informal reports for each participant.	93%
Jung, Sainato and Davis (2008)	Children told to play with peers and toys without low-p requests in the same setting with intervention during center time	Not reported	questionnaire asking whether parents and teachers considered each research question to be valid and useful; professionals in early childhood special education complete a checklist after viewing videotaped segments of all experimental conditions for each child HIGH	experimental session: 99% generalization session: 98%
Katz & Girolametto (2015)	4-7 weeks after intervention social initiations and respondings maintained and generalized their response and initiation skills to an untrained peer Generalization results not reported	Rated at 100% compliance in all five social skills training sessions	Two blinds for the interventions colleagues rated recordings which were randomly ordered. They were asked to respond to questions about the observed frequency of the target children's responses and initiations.	93%
Koegel, Vernol,	Not reported	Not reported	Not reported	97%

Koegel and Paullin (2012)				
Kohler, Greteman, Raschke and Highnam (2007)	Not reported	Not reported	Not reported	Not reported
Lee, Odom and Loftin (2007)	Not reported	used an 18-item scale with a 3-point rating system where 3 is when the item was fully implemented). The intervention items rated with 3; It was selected a 2-min segment of baseline and intervention phase sessions for each child in the intervention and generalizatio n settings and five teachers watched the segments and completed a social	Teachers watched 2min segments and completed a social validation rating scale for each Questions to parents and teachers and anecdotal information (not reliable)	85%

		validation rating scale for each of them.		
Loftin, Odom and Lantz (2008)	No formal measure	checklist for each observation and instruction session completed by investigator and research assistant	Questions to parents and teachers about the goals, procedures, and outcomes of the study	97%
Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014)	Not reported	checklist that was completed by trained research staff with mean score 94% (range of 80-100%)	Mix of questionnaire and anecdotal questions (not reliable) completed by school staff	85%
McCurdy & Cole (2014)	Not reported	Not reported	Rating scales (IRP-15 and CIRP) completed by teachers.	93%
Owen-DeSchryver, Carr, Cale and Blakeley-Smith (2008)	Not reported	Not reported	No formal data but anecdotal/informal reports (not reliable) valued by peers, parents and teachers	83%
Rodriguez-Medina, Martín-Antón, Carbonero and Overjero (2016)	Not reported	Not reported	Record students' satisfaction rating it on a five-point Likert-type scale; Teachers and specialists completed a	Not reported

			brief satisfaction survey rated a 5-point Likert-type scale	
Schmidt and Stichter (2012)	Use a SCI-A program curriculum that targets the generalization of social behaviors in untrained settings	Data collected from two checklists which rated from typical peer participants	Not reported	88%

11.Maintenance / Generalization

Maintenance and generalization of new skills are important indicators of the overall effectiveness of an intervention (Bellini & Hopf, 2007; Watkins et al., 2015; Watkins et al., 2019). Also, generalization of skills is a basic clue of social skills interventions, studies need to examine it and professionals implement generalization of skills when developing a social skill intervention.

In the nine of 15 studies (60%) maintenance or generalization data haven't been reported. Six of the studies 40%) provide maintenance and generalization measures but one of them provide only maintenance data.

12.Implementation fidelity

Implementation fidelity or treatment integrity or intervention fidelity, is the degree to which the implementer apply the intervention as it was planned. For assessing the implementation fidelity, the research team should think the data collection method, the frequency of data collection and the individual who will collect them.

Seven (47%) of 15 studies evaluated the treatment fidelity of intervention. In two of these studies even though the treatment integrity checked by completing a scale and checklist from professionals and parents there are no numerical data. The rest of studies which assessed treatment fidelity have high scores of fidelities.

However, the studies have been implemented by researchers and it is not possible to prove whether they can be implemented by professionals and parents with high fidelity and it is difficult to make correct conclusions about the treatment fidelity of studies.

13.Social validity indicators

Social validity is an important factor for controlling the effectiveness of intervention. It is reported as to whether the proposed intervention and also the acquisition of behavior represents a socially accepted practice. Discussions with team members, questionnaires or document with blanks at the start of the intervention can determine whether those involved (e.g., teacher, parent, student) believe that the intervention is socially valid. In a study that checks the social validity of results, it is more likely that teachers and parents will be more motivated to make an attempt to implement the intervention. Social validity usually checked either through interviews, rating scales or through questionnaires to participants or teachers and parents. The presence of social validity in each study coded from the teachers' or parents' satisfaction in the study results. The studies that measured social validity provided quantifiable data from teacher and parents completed scales or questionnaires.

Most of the half-included studies measured the social validity of survey. The ten of 15 studies (67%) checked the participants', teachers' or parents' satisfaction and collected data and comments.

The most common social validity indicator was the questionnaires or simple questions of study results which used either as a basic measure either mixed with anecdotal reports or scales. Four studies used questions or questionnaires, two of the studies based in informal/anecdotal parent's or teacher's reports while other two studies used rating scales completed by teachers and specialists.

One study from ten that measured social validity used a mix of rating scales, questions and anecdotal reports (Lee et al., 2007), two of them used a mix of both questionnaires and anecdotal reports. and five of 15 studies (33%) have not reported social validity.

14. Inter-rater Reliability

Interobserver agreement refers to assessment of how well the data from discrete observers relate. It's normally checked consistently all through the research ought to be at least 80% in order to be considered the observations reliable.

Interobserver agreement should have been collected on at least 20% of sessions across all conditions, raters, and participants with inter-rater agreement at up .80 (Reichow et al., 2008). All the analyzed studies (n=16) have an effect above 81% and most of them (8) meet an agreement up to 90%. Two of the included studies have not reported reliability data. Everything is presented in the following Table (Table 5).

Table 5.
Results of PND and IRD

Study	Results	PND	IRD
Banda, Hart and Liu-Gitz (2010)	Increased target behavior	100% (HE[4])	1.0 (VLE[5])
Brain & Mirenda (2019)	Improvements in all three target behaviors	95% (HE)	.95 (VLE)
Chung, Reavis, Mosconi, Drewry, Matthews and Tasse (2007)	Improvement in at least one advanced social communication subscale. ¾ demonstrated improvement in both ECR (elaborated contingent response) and IC (initiating comments), skills necessary for effective communication.	54% (Q[6])	.51 (ME)[7]
Ganz & Flores (2008)	Script phrases increased for all three participants (effective) Unscripted phrases remained in low rates (ineffective) Context-related phrases increased a very effective or effective Responses remained in low rates for the two of 3 participants (ineffective) Intervals in which any speech occurred increased for all participants throughout intervention and	76% ([8]E)	0.76 (VLE)

[4] HE= High Effective
[5] VLE= Very Large Effects
[6] Q= Questionable
[7] ME= Moderate Effects
[8] E= Effective

	generalization but PND calculations suggest effective treatment for only one participant.		
Harper, Symon and Frea (2007)	Both participants improved their social peer interactions during recess	76% (E)	.77 (VLE)
Jung, Sainato and Davis (2008)	Increased social peer interactions during recess	100% (HE)	1.0 (VLE)
Koegel Vernol, Koegel and Paullin (2012)	Engagement and initiations of ASD children improved.	95% (HE)	0.95 (VLE)
Katz & Girolametto (2015)	Improved frequency of the three ASD's children's initiations and responses to trained peers. Improved frequency of responses to untrained peers	97% (HE)	.96 (VLE)
Kohler, Greteman, Raschke and Highnam (2007)	the frequency of social overtures from peers to ASD child increased and ASD child directed more overtures to her peers	87% (E)	.85 (VLE)
Lee, Odom and Loftin (2007)	Social engagement increased and stereotypic behavior heavily decreased especially the simultaneous motor behavior	100% (HE)	1.0 (VLE)
Loftin, Odom and Lantz (2008)	social initiations successfully increased and repetitive motor behavior decreased	86% (E)	.86 (VLE)
Mason, Kamps, Turcotte, Cox, Feldmiller and Miller (2014)	All participants improved their total communication acts in recess	97% (HE)	.97 (VLE)
McCurdy & Cole (2014)	Off-task behavior of students with ASD reduced	100% (HE)	1.0 (VLE)
Owen-DeSchryver, Carr, Cale and Blakeley-Smith (2008)	initiations increased for two of the three ASD participants; both peers and the students with ASD showed an increase in the rate of responses	71% (E)	.71 (LE[9])
Rodriguez-Medina, Martín-Antón, Carbonero and Overjero (2016)	Slightly increase of target behaviors in the intervention phase but initiating and responding skills maintained after intervention; challenging and inadequate interactions decreased while adequate interactions increased; no significant change in low-intensity interactions or time he/she was alone in recess.	26% (NE)	.26 (Q)

[9] LE= Large Effects

Schmidt and Stichter (2012	Social competence for each participant increased and generalization of skills acquired in non-intervention settings enhanced	45% (N[10]E)	0.39 (Q[11])

15.Discussion

The current decade there is a growing amount of research on social skills interventions for individuals with ASD (Reichow et al. 2010). More precisely, they need clear strategies that give them opportunities to establish relationships and develop reciprocal friendships. This study analyzed the intervention's effectiveness by providing a quantitative analysis of intervention results which come to a conclusion of moderate to large effects in efficacy of PMI intervention strategy.

The study described 15 Peer Mediated Interventions that have been developed and evaluated to increase interactions among ASD participants and typical development peers. The results are equally the same with those of previous review and metaanalysis studies indicating that interventions which target in increasing the social interaction among students with ASD with their peers in inclusive settings are increasingly effective for children with ASD (Watkins and O'Reilly, 2019; Chang and Locke, 2016; Watkins et al., 2014). The outlines of the above studies indicate that PMI is a promise and effective intervention approach for children with ASD, as the majority of studies reviewed reported positive results and the findings of study are consistent with findings of previous reviews and meta-analysis that examined the effectiveness of PMI on children with ASD (Aldabas, 2019; Martinez, 2019; Chapin, 2018; Ramos et al., 2018; Chang and Locke 2016; Zagona 2016; Ezzamel and Bond 2016; Watkins 2015; Whalon 2015; Trottier 2011; Sperry 2010; Chan 2009. Also, the fact that majority of studies had large or moderate rating results supports the findings of previous studies which claims that PMI has positive outcomes in social behavior of children with ASD. Only one study reported questionable results, and one study had negative findings.

Most of the included studies participants were male and belong to high functioning level of ASD. The majority of male gender in PMI studies is justified because of the

[10] N= Non-Effective
[11] Q= Questionable Effects

frequency in appearance of disorder in boys. The high functioning level of studies participants, strengthen the results of previous studies that highlight the successfully of PMI in high functioning children with autism and enhance them. Thus, there is a potential for future studies to investigate the effectiveness of this intervention in low functioning students with autism. Also, even though males are in overwhelmingly, all PMI interventions seem to have positive results in female participants too and this fact expand the intervention's efficacy.

Even though in all studies readers can assume some evidence about the functioning level of participants either from IQ or writer's information, the cultural background is not so easy understandable. The culture in which participants belongs is known in a minority of analyzed studies (n=4) but ethnicity is an important variable that should be considered when designing an intervention. (Pierce et al., 2014, Watkins et al., 2019). ASD children who are immigrants from other countries or live in underdeveloped countries, may need an intervention approach with different perspectives. Duration of intervention doesn't seem to affect the successfully of program. These findings confirm the results of Watkins et al., (2019) who claims that short interventions can produce strong effects. It stands to reason that a treatment that lasts 6 hours in overall can provide more complete strategies in participants than one which lasts 2 hours in total, but according to these findings we cannot confirm this possibility.

The majority of studies used modeling and role-play as part of the peer training phase. From one perspective this fact seems that these strategies are a good treatment package that can be combined with several intervention types in order to teach behaviors. On the other side, peers may need a more creative strategy that promote critical consideration in order to think and plan alone ways to interact with ASD participants (Chang and Locke, 2016).

The results in analyzed interventions produce moderate to high effects in the target behavior. Interestingly, there is not a significant number of interventions which reported as increased in all the target behaviors for children with ASD. Some of these studies identified as effective in the visual analysis, but they didn't succeed in all target behaviors of ASD participants. Also, there are generally positive findings about the generalization, maintenance, and social validity of PMI that further supports the use of this method. Wang and Spillane (2009), in a metanalysis study of evidence-based social skills interventions for children with autism, asserted that parents and teachers should

believe that an interventions strategy is effective and appropriate in order to make an effort to implement it and increase the fidelity of intervention. Most of the selected studies have measured social validity and the half of them (n=8) evaluated the treatment fidelity of intervention. Even though maintenance and generalization data are important indicators of the overall effectiveness of the intervention, they haven't been reported from the majority of studies. While treatment success is dependent to a large extent on fidelity of implementation, most of the included studies haven't measured it. There are only two studies which provide us a complete measuring of these significant indicators of research effectiveness (Brain & Mirenda, 2019; Katz & Girolametto, 2015). PMIs are evidence-based practices but the creators of this approach should choose the strategies carefully as well as the implementer of them. In case of teachers being the implementers of PMI program, there is a need for carefully training in order to increase the treatment fidelity.

16.Limitations

This study evaluated only a small number of Peer Mediated Interventions published between 2008 and 2020. It may be beneficial to analyze more studies in order to draw a better conclusion but the studies done up to 15 years ago, may had less effective interventions components.

Another limitation is the fact that this synthesis included only Single Case Design studies with no Randomized Controlled Trials studies and may the results from these studies be weaker than of randomized controlled trials. This occurred in order to compare studies with the same structure and find the best intervention components for a future complete and effective intervention in all domains. Future review should investigate important indicators and moderators of randomized controlled trial studies with larger sample of ASD participants.

This study mainly focused in treatment session and check only if studies had generalization, treatment fidelity and social validity data without further analyze them. But we need three additional plan components such as generalization and maintenance, implementation fidelity and social validity which help to ensure the success. For this reason, future studies should focus in a detailed investigation about how studies

implement these components out of the intervention in order to have long-term outcomes.

Future studies should provide more evidence about the ASD participants characteristics. Specifically, they need to report the functioning level and ethnicity of ASD participants in order to know for whom PMI strategies will be most efficient and the researcher could better interpret the problematic child's social behaviors if they have. Also, there is a need to expand the literature about the efficacy of PMI in low functioning ASD participants as well as the influence of peers in improving the academic skills of ASD participants. Finally, future studies need to collect post-intervention data.

The continuing research on PMI strategy will provide important guidance and will strengthen the findings for new skills in the social acceptance of ASD children in inclusive settings.

METHODOLOGY AND DESIGN OF THE RESEARCH

1. Defining the problem

Social interaction difficulties are a defining feature of Autism Spectrum Disorders (Diagnostic and Statistical Manual of Mental Disorders, DSM-5; American Psychiatric Association, 2013). Children with autism spectrum disorder have difficulty in establishing and maintaining peer relationships over time (Locke et al., 2012) and face significant difficulties in their integration into the general school. As the inclusion rates of children with autism in typical classrooms keep on rising, social consideration with peers turns into a primary concern (Rotheram-Fuller and Jill, 2005). In United Kingdom, the 71% of students with ASD attend general school (Department for Education, 2013).

The limitation of generalizing social abilities require the education of ASD students in taking initiatives and responses during interaction with their schoolmates. The best time for this effort is during the time of school recess. Researches showed that children with ASD in comparison with their peers interact less with other children, are less truly dynamic and staying next to adults during recess (Lang et al., 2011; Anderson et al., 2004; Gutierrez et al., 2007; Lang et al., 2009).

Parents and professionals are looking to inclusive settings which give social opportunities for children with autism that could be lacking in a self-contained setting (Boutot & Bryant, 2005). Undoubtedly, the inclusive settings contribute to the development of social skills, but the transition of children with autism to them alone doesn't ensure the improvement of their sociability (Koegel, Koegel, Frea, et al., 2001). Therefore, an intervention program is still necessary in order to improve the social acceptance of these children. In fact, according to Koegel, Koegel, Frea, et al., (2001) the intervention should be systematic and it should be provided immediately after their inclusion in the new setting.

One of the most significant advantages of inclusive classrooms is the chance to create social support groups with typically developing peers and their classmates with disabilities (Boutot & Bryant, 2005). If children with autism manage to obtain significant, reciprocal social relationships with peers, they could complete an emotional and even cognitive development (Scheuermann and Webber, 2002).

Even though inclusion of children with disabilities in school settings is increasing over the years (Locke et al., 2012), it is not clear that it can really benefit the social associations of these children. Children with autism in general school usually play in separation from their schoolmates and rarely take initiatives to interact with them (Sigman and Ruskin, 1999). Even though previous research has suggested promising intervention models which decrease the social deficits of elementary school students with ASD, few of these models have been developed into training packages and shared to school teachers in order to use the for promoting social interaction of ASD students. As it is mentioned in the Chapter II, Peer Mediated interventions have been particularly successful and make one of two most promising intervention methodologies which improve social skills of children with ASD (Chang and Locke, 2016; Chan et al., 2009; Reichow & Volkmar, 2010). Typically developing classmates are important role models for imitating desirable social and communicative behaviors and PMI is a well-suited intervention for use in school settings because it can be easily applied in natural school routine (Carter et al., 2017). By teaching peers with several behavioral and social strategies, can benefit children with ASD to be more accessible in school settings. According to Owen De-Schryver, et al. (2008), when a trained team of typical development children starts to interact with their ASD classmates, encourage the rest of untrained peers to imitate their example. Brain and Mirenda, (2019) conducted a peer-mediated intervention for middle school students with autism spectrum disorder. Results showed an increase in engagement and communicative acts among ASD participants and peers and the intervention program proved appropriate for use by trained school staff. According to Brain and Mirenda (2019), it would be helpful for students with ASD who have limited interests to create an intervention that expand appropriate play activities in conjunction with PMI. Sivaraman and Fahmie (2018), identified that by incorporating common preferences in order to match interests of ASD participants and typical peers, the socialization of children with autism and their peers could be improved. In this study, three ASD early-aged children were involved in play activities with peers which have been selected based in their preferences assessments. There was no further social skill training, neither direct teaching but engagement with peers and initiations between them was effectively increased during play.

Also, Koegel et al. (2013) integrated favored interests in the regular lunchtime activities of young people with ASD in inclusive settings. Common interests identified by using interviews of ASD participants and then, incorporated into the club activities of

lunchtime. Social engagement and initiations of ASD participants increased and structured activities were enjoyable for both ASD and peer adolescences. This study is an extended version of the study of Koegel et al. (2012), where school-aged children participated in special lunch clubs which constructed according to the ASD children's preferences in order to promote peer engagement by providing opportunities to peers to engage in these activities and socialize with target children. According to Sivaraman and Fahmie (2018), a future common interests-based study with some training for the typically developing peer could increase these results. Common interests are a particularly interesting topic for further research as they can enable the establishment of a friendship with maintenance in time.

This study aimed to: a) extend this line of research with a lengthier intervention that combine both PMI intervention and social activity which emphasize the common interests between the ASD elementary school students and their typical classmates b) to evaluate the effectiveness of this intervention package by using it from Special Education teachers who works in promoting the social interaction of children with ASD and their peers.

2. Objective and research questions

The effect of the intervention, concerning the improvement of ASD students' socialization, was evaluated through a single case design. This study used a multiple baseline design. Even though the baselines were non-concurrent, the study lasted almost 4 months and all participating students' groups started baseline within a 3-week period. The differentiation was due to several reasons, such as the availability of each child, which depended on the time the school year commenced. Consequently, the objectives that arise from the literature review and the context in which they will be explored are:

- Is there a functional relationship between peer-mediated support and students with ASD during recess period in school?
- Is there any increase in communicative acts made by students with ASD towards their peers and by peers to ASD students?

- Could an intervention based on common preferences of young children with ASD and their typically developing peers lead to an increase in social initiations and responding during school day?
- How have target pupil, peer and school level outcomes related to Peer-Mediated Interventions for pupils with ASD been evaluated?'

Ethics approval was secured from the administrative team of the school where the study was conducted. The parents of ASD students and peers received detailed information about the intervention program and the goals of this procedure and gave their consent for their children's participation in this study. All participant names are pseudonyms.

3. Design of the Research

Multiple baseline designs are used to examine the functional relationship between the intervention and the target behavior (Barlow et al., 2009; Kazdin, 2011). In this design, two or more behaviors are examined to specify the baseline condition, and then an intervention is implemented. The independent variable is introduced at a different time for each individual or behavior, and there are different types of experimental designs with multiple baselines, like the designs that involve the intervention of different experimental subjects, behaviors and conditions (Kazdin, 2011). Firstly, the researcher collect data from the baseline of all individuals who participate in the research. When the performance of all participants fluctuates at similar levels and the rates do not deviate significantly, the intervention is applied to them. Then the data of the person who received an intervention must be changed, while the rest stay at baseline levels. The effectiveness of intervention is demonstrated if the behavior of each person or subject changes in the desired direction, at the time that the intervention is introduced (Kazdin, 2011). The most important advantage of multiple-baseline design in a school-based intervention, is that results may generalize across behaviors and there is no need to intervene on each behavior separately (Sulzer-Azaroff & Mayer, 1991).

In multiple baselines design the validity of the experimental procedure is not based on the removal of intervention like other individual experimental designs (e.g. in ABAB) that would involve manipulation of the independent variable. This way practical and ethical limitations can be avoided and the gradual application of intervention at each

baseline gives the opportunity of improving the intervention if it proves to be inadequate at the first baseline (Alberto & Troutman, 2013; Kazdin, 2011).

A nonconcurrent multiple baseline design across participants was used to assess the effectiveness of PMI. Three conditions were conducted in this study: baseline phase, intervention phase and follow-up phase. These phases lasted totally twelve sessions while each session lasted 10 minutes during recess period of every school day. The experimental design was nonconcurrent while the baseline data collection did not begin simultaneously for all participants, but at different times (Barlow et al., 2009). Then, the start time of the intervention did not coincide for any of the 5 children.

4. Population and Sample

4.1 Sample selection

For their participation in the study, the ASD participants should meet the follows criteria: (a) ages 7-10 years (b) diagnosed with Autism Spectrum Disorder ASD through an independent assessment by a multidisciplinary team (c) attending in general school setting (d) low social engagement with classmates with verbal communication ability (e) accept an individualized education program through a Learning Support Assistant called Parallel support as we mentioned in Abstract section.

After a period where a number of peer participants were selected from special education teacher's observations and classroom teachers' recommendations, the final selection based on: a) similar classroom and grade level, b), student willingness to participate, c) previous expression of interest in interacting with their classmate with ASD, d) good social skills, e) Availability/Consistency

The selected peers should attend in the same grade level and school class with an ASD participant and selected according to teacher nominations who had the following characteristics: (a), (b) previous expression of interest in interacting with their classmate with ASD and (c) students with systematic attendance at school.

4.2 Participants

Five groups of participants were recruited for this research and consisted of five students with autism spectrum disorder (ASD), and twenty-five typical development peers.

ASD Participants

All five ASD students live with their natural families who belong to the middle of the social hierarchy and attend in public elementary schools of Athens, Crete and Mytilene Island. In the scale GARS-2, all participants scored in the mild/moderate range of autism. Table 6 below, gives more information about each ASD student.

Table 6.
Participants' information

NAME	GENDER	CHRONOLOGICAL AGE	GARS-2 score	
			Communication	Social interaction
Nikos	Male	9-3m	27	28
Dimitriss	Male	8-7m	19	23
Giorgos	Male	8-5m	19	25
Ioanna	Female	9-8m	32	38
Thanasis	Male	8-2m	23	25

Peer participants

Five typical peers from ASD participants' classroom participated in the peer training intervention. The selection of peers who were going to participate in the intervention program based on observations in recess and recommendations of classroom teachers. When they recommend a number of potential peers, special education teachers chose the peers who are going to participate in the study.

Peers were selected based on the criteria of McEvoy et al. (1990), which include (a) the student's willingness to participate; (b) consistent attendance of the student at school; (c) compliance with instructions; and (d) student's ability to replace any schoolwork missed during training. Exclusion factors for participation were a history of bad relationship among ASD children with a peer.

4.3 Sample description

Group 1: Nikos

Group 1 included Nikos, a 3rd grade Greek student with ASD, 5 typical developing classmates and a special education teacher with four years of teaching experience. Peers

group recruited from 3 girls and two boys 9 years old. Peers were 9 years old and spoke Greek.

Nikos was diagnosed with Autism Spectrum Disorder (ASD) from an official government's organization where he assessed by a multidisciplinary team. He lives in Mytilene Island with his natural family who have an average education level and belongs to average social strata. Nikos attend in third grade of elementary school and he follows an individual educational program supervising by a Parallel Support Teacher for twenty-four hours per week (full time) during the school program. He was able to follow daily routines at school but he needed additional support with daily living skills and after the school he was attended in psycho and speech therapy lessons. In the beginning of the research, he was 10 years and 3 months old. Nikos was able to communicate verbally but he made limited conversational attempts with his classmates and he rarely reciprocated in peer's questions. Even though he was taking prompts from special education teacher to communicate with his peers in recess, his social communication level was significantly short of his age. Also, he usually avoids eye contact during social interactions but he had some learning skills such as learning memory and he got well with numbers in Math. According to teachers' nomination he showed signs of aggression and maladapting behavior. In the GARS-2 rating scale (Gilliam, 2006) the Autism Index which contained the field of communication and social interaction was 115 (>85), down to the mild score and identified that he has autistic characteristics (Table 7).

Table 7.
Participant 1: Nikos- Results of Gilliam Autism Rating Scale – Second edition (GARS-2)

Score summary	Raw score	Standard score	% ile	Autism index
Communication	27	13	84	
Social interaction	28	12	75	
Sum		25	84	115

Group 2: Dimitris

Group 2 consisted of a 2nd grade Greek student, 5 typical developing classmates and a special education teacher with five years of teaching experience. Peers group recruited

from 3 girls and two boys 8 years old. Peers were 8 years old and their primary language was Greek.

Dimitris was diagnosed with Asperger Syndrome from an official government's organization where he assessed by a multidisciplinary team. He lives in Athens with his natural family who has high educational and economic level. Dimitris attend in the second grade of public elementary school and he gets an individual program related to educational and functional communication from a Parallel Support Teacher about twelve hours per week during the school program. His school performance was in medium level and he can complete some academic tasks without supervision. He had verbal communication with a variety of spoken words but his conversational skills were limited. He had a disability in how to express his feelings and respond to social interaction of his classmates while he usually walks alone in recess and speak to himself. In the GARS-2 rating scale (Gilliam, 2006) the Autism Index which contained the field of communication and social interaction was 100 (>85), a fact that shows a high standard score (>85) performance with identified autistic characteristics (Table 8).

Table 8.
Participant 1: Dimitris- Results of Gilliam Autism Rating Scale – Second edition (GARS-2)

Score summary	Raw score	Standard score	% ile	Autism index
Communication	19	10	50	
Social interaction	23	10	50	
Sum		20	500	100

Group 3: Giorgos

Group 3 consisted of a 1st grade Greek student, 4 typical developing classmates and a special education teacher with 2 years of teaching experience. Peers group recruited from 4 boys 7 years old. Peers were 7 years old and their primary language was Greek.

Giorgos was diagnosed with Autism Spectrum Disorder (ASD) from an official government's organization where he assessed by a multidisciplinary team. He lives in Sitia, a small town of Crete Island with his natural family who have medium educational and economic level. Giorgos attends in the first grade of public elementary school, in one-year smaller grade level according to his chronological age. He gets an individual program related to educational and functional communication from a Parallel Support

Teacher about twenty-four hours per week during the school program. He also received three times per week speech therapy a service after school (private). Giorgos communicated verbally by using some words and was able to make requests but he did not initiate social interactions with peers and remained alone during recess. In recess, he often followed peers without speaking to them nor participating in the games. In the GARS-2 rating scale (Gilliam, 2006) the Autism Index which contained the field of communication and social interaction was 103 (>85), a fact that shows a high standard score (>85) performance with identified autistic characteristics (Table 9).

Table 9.
Participant 3: Giorgos- Results of Gilliam Autism Rating Scale – Second edition (GARS-2)

Score summary	Raw score	Standard score	% ile	Autism index
Communication	19	10	50	
Social interaction	25	11	63	
Sum		21	58	103

Group 4: Ioanna

Group 4 consisted of a 2nd grade Greek student, 5 typical developing classmates and a special education teacher with 6 years of teaching experience. Peers group recruited from 3 girls and 2 boys 9 years old. Peers were almost 8 years old and their primary language was Greek.

Ioanna was diagnosed with Autism Spectrum Disorder (ASD) from an official government's organization where he assessed by a multidisciplinary team. She lives in Athens with her natural family who have higher educational and economic level. Ioanna attends in the second grade of public elementary school. She repeated the 1st grade after the teacher's recommendation and she had moderate to low language abilities. After the school day she received daily private speech and psychological services. In recess, she used to walk alone observing the other children. When she got closer to the boy peers, she provokes them by displaying negative expressions to them such as "shut up" and words like "idiot" and "loser" while sometimes she pushes and kick some boys from her class. She showed to go better with girl classmates but they still hadn't any friendly connections. In the GARS-2 rating scale (Gilliam,1995) the Autism Index which contained the field of communication and social interaction was 132 (>85), a fact that

shows a high standard score (>85) performance with identified autistic characteristics (Table 10).

Table 10.
Participant 4: Ioanna - Results of Gilliam Autism Rating Scale – Second edition (GARS-2)

Score summary	Raw score	Standard score	% ile	Autism index
Communication	32	15	95	
Social interaction	38	16	98	
Sum		31		132

Group 5: Thanasis

Group 5 consisted of a 3rd grade Greek student, 4 typical developing classmates and a special education teacher with 3 years of teaching experience. Peers group recruited from 3 boys and 1 girl 9 years old. Peers were almost 8 years old and their primary language was Greek.

Thanasis was diagnosed with Autism Spectrum Disorder (ASD) from an official government's organization where he assessed by a multidisciplinary team. He lives in Athens with his natural family who have higher educational level. Thanasis attends in the third grade of public elementary school in one-year smaller grade level according to his chronological age. He repeated a grade level in the kindergarden after teachers' suggestions and he received full-time support from a special education teacher since the first-grade level. He received private speech and occupational therapy services after school. Thanasis exhibited limited social interactions. In recess he ate alone and rarely interacting with other students. When he getting closer to them, involved to talk or imitation of his favorite cartoon character but he actually didn't engage with peers. In the GARS-2 rating scale (Gilliam, 2006) the Autism Index which contained the field of communication and social interaction was 106 (>85), a fact that shows a high standard score (>85) performance with identified autistic characteristics (Table 11).

Table 11.
Participant 5: Thanasis - Results of Gilliam Autism Rating Scale – Second edition (GARS-2)

Score summary	Raw score	Standard score	% ile	Autism index
Communication	23	11	63	
Social interaction	25	11	63	

Sum	22	65	106

4.4 Setting and Conditions

The children who participated in the research were attending in Greek elementary schools near their place of residence. More precisely, participant 1 was attending in a central public school of Mytilene Island, participant 2, 4 and 5 were attending in elementary public schools from Athens district and participant 3 was attending in elementary school placed in a village of Crete island. All the participants supported from a Parallel support Teacher, in order to help them with the learning process and socialization.

The whole intervention program conducted in elementary schools where the children with ASD attended. Data collection took place during the recess period where spontaneous social interactions promoted among children. The intervention program was applied from trained school staff and more precisely, the special education teacher who is responsible for the ASD's student individualized program and the ASD's participant's classroom teacher.

The peers that selected for join in research participated in the same activities as their classmates and were made no changes to the school environment for the needs of the research. During the research period, teachers did not take any special care of the children who participated in the research, as well as did not organize the free play of their students or interfered with any other way in this. The only case that they could intervene, was to manage behavioral problems or prevent violent or provocative behavior of children.

Peer training sessions took place in empty classrooms during school program (i.e., students who were not participating in the study were not present during training). Baseline and intervention sessions took place during recess in the school yard, the area. Greek school provide two or three recess period in students. In this period, all students in the school ate breakfast in the school yard and then had free time to play period was approximately 30 min long and was supervised by 4–5 educational assistants, teachers, and/or parent volunteers.

The data collection took place during recess in the school yard area. Greek school provide two or three recess period in students during a school day. Free play periods considered ideal for promoting social interactions between children opposed to

structured activities, where students' attention is more focused on the school teacher. The observations began in the first recess period for about 10 minutes.
It should be mentioned that there were not any changes to the school environment for the needs of the research and no teachers or researcher interfere in the free play condition except from need to prevent challenging behaviors.

5. Instruments of the Research

The research tools that have been used except the form of initiations and responses (3.3.2 section of this chapter), were a book story related to ASD and a game that promotes the common interests between participants.

The book named “To avgo” (Vakirtzi, 2014), in English “The egg”, is referred to a little ASD boy. He hardly speaks at all, he avoids looking most people in the eye, he doesn't make friends easily and he likes to spin a piece of string in the air for hours. And all this because the little child happens to live in a big white egg with a very hard shell. In other words, this book is an introduction book to the phenomenon of autism. The story of this book is going to be read to the peers of ASD students by the teachers who participate in this study.

Additional materials included some visual cue cards that had the name of the skill and completion forms that were given to each student in order to fill his/her answer and including the answers of the rest group. The topics of the tool deal with areas of interest of the student’s daily life, such as:

- Favorite hobby
- Favorite food
- Favorite movie
- Favorite color
- Favorite board game
- Favorite animal
- Favorite subject in school
- Favorite season

In more detail, it aimed to cultivate and promote the discussion/conversation between the members of the group so as to achieve:

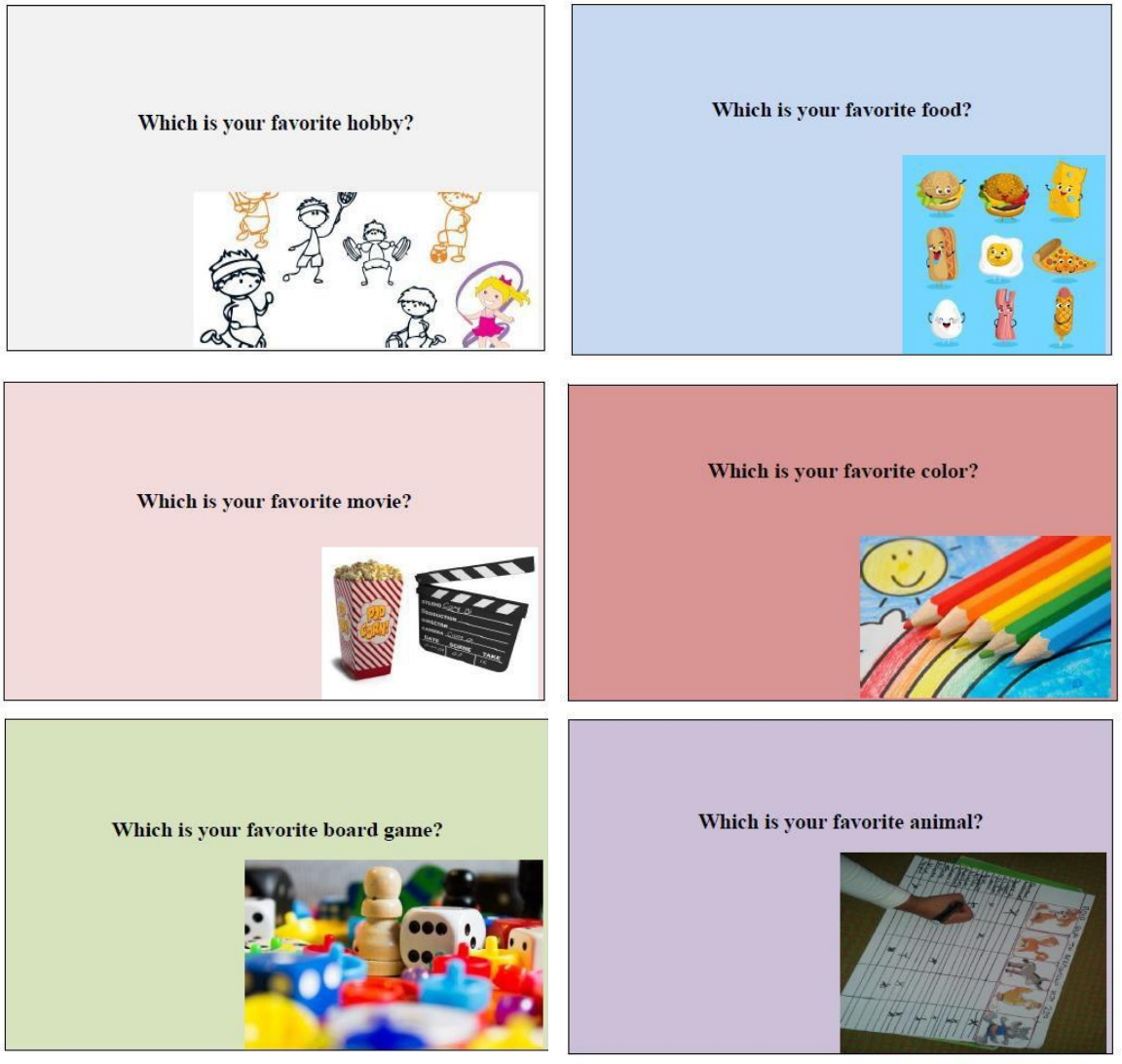
1. Social interaction
2. Linguistic interaction
3. Response to interaction

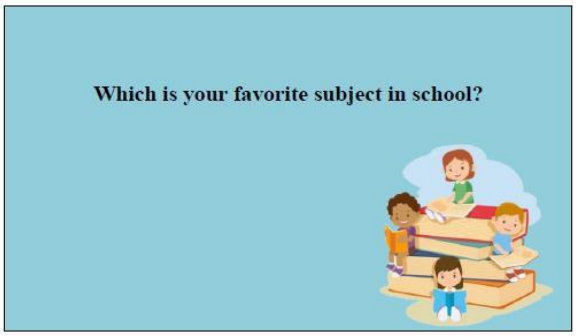
As far as the design of the game is concerned, 8 interest cards and 6 fill-in forms have been created that will be given to each student in the group to fill in the answers of the others. Each student draws a card from the pile of cards and asks a question to each student in turn, while at the same time the others fill in their answers on the answer sheet. The purpose is for the participants to come into direct communication and conversation discussing their interests/preferences, while finding possible common options with their classmates. The choice/creation of question cards has been made in such a way as to avoid obstacles-difficulties for students with ASD, after an extensive literature review of ASD and its correlation with their peers.

The cards of common interest game are presented below (Picture 1).

Picture 1.

Cards of common interest activity





The fill-in form of common interest game that was given to each student is presented also below (Picture 2).

Picture 2.

Fill-in form of common interest game

Students/ Preferences	Me	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby						
Favorite food						
Favorite movie						
Favorite color						
Favorite board game						
Favorite animal						
Favorite subject in school						
Favorite season						

6. Variables

6.1 Independent variables

In table 12 variables' denomination and their corresponding categorization is presented.

Table 12.
Independent variables

Variables	Categories
Gender	1. Male
	2. Female
Type of student	1. Typical student (T.S.)
	2. Autistic student (A.S.)

6.2 Dependent variables

The variables of the study have been selected according to the results of the meta-analysis performed by the researcher before the implementation of the intervention (Chapter 2). According to that study which includes 16 studies belonging to the category of PMI that aims to improve the social interactions between typical peers and ASD children, the most commonly used variable were initiations from ASD children and responses made by ASD children to peers. So, this study examined two dependent variables through observation probes. These variables included the frequency of social initiations made by ASD students to peers and the frequency of responses made by ASD students toward peers' initiations. The number of initiations and responses were recorded in a special form designed by the researcher. This form is presented in Appendix (Appendix 1).

Social initiations included: (a) questions made by ASD students toward one or more peers (e.g., "do you want to play with me?"); (b) emotional expressions, such as unprompted gestures (e.g., high-five, hugs) and facial expressions (e.g., smiling, eye contact); (c) participation in activities on their own accord; (d) attempts at getting attention defined as vocalizations; (e) invitations defined as verbal or gestural offers to start a communication (e.g., "let's go play"). An initiated attempt had to include at least a consonant and a vowel sound (e.g., I am…, soooo…, eeemmm). Sudden sounds, such as screams or laughter, were not coded as initiations even though the student had eye-contact with one peer. This variable was coded by summarizing the number of initiations in every five categories. In the case that one ASD student engaged in more than one category of initiations, the first behavior that was noticed and was the one that

helped us to categorize it accordingly. For example, if a child asks, “Do you want to play?” while smiling and pointing toward the playground, this counts as one initiation in the category of a question. The range depends on each student’s efforts for initiations.

The responses were defined as verbal and non-verbal responses to peer initiatives for interaction. If a response to peer initiation was assisted by a teacher, then it was not included in the measurements. The field of responses was coded by calculating the number of successful responses divided by the total number of their peer’s questions. The range was 0–1.

In Table 13 below, many questions are categorized giving some examples in the description.

Table 13.
Categories of Initiations

Category	Description
Questions	General questions toward his/her peers e.g., “what is this?”, “what should we do now?”
Emotional expressions	Verbal or non-verbal expressions e.g., unprompted gestures (high-five, hug) or facial expressions (smiling, eye contact)
Engagement	Willing to participate in activity or game with peers. e.g., by asking “what is this game?”, “I wanna play too” or by moving and start play without saying a word.
Try to get attention	Attempts to get the attention of peers with movements or verbal expressions “dancing” or “cartoon imitation”
Invitations	Invite peers to participate in activities other than play activities e.g., “come and sit with me” “do you want some chips?”

7. Trained School Staff and Researcher

The children were attending in elementary public schools and all ASD participants were under the supervision of a specially trained teacher, who was graduated from university and was specialized in special education. The first ASD participant (Nikos), was accompanied by the researcher while the other four participants accompanied by

specialized teachers in individualized educational programs for students with autism. Their work experience in integration programs of children with ASD in elementary school was about two to six years.

Before the start of program, the author trained in the intervention procedure all the specialized teachers who accompany the ASD participants together with classroom teachers of target pupils. Training occurred one week before the start of intervention program in two-hour workshop where the researcher explains the process and modeled by the school staff. The researcher ensure that all the interventionists took the necessary record and teaching materials.

The data collection in all phases for the first participant and his classroom peers were done by author in cooperation with the classroom teacher who collected data in predetermined number of sessions, in order to check the inter observer agreement. As for the other four ASD participants and peer groups, data collection done by trained special education supporters in cooperation with trained classroom teachers in order to check the observations agreement.

8. Procedure

The children who participated in the research attended Greek elementary schools near their place of residence. The whole intervention program was conducted in elementary schools where the children with ASD attended. Approval from the Ethics Committee or Institutional Review Board was not necessary because the Parallel Support Teachers that had applied the intervention program were already staff of the specific schools where the ASD students were studying. Regarding the Declaration of Helsinki, a consent form for each ASD student and each typical student was obtained from their parents before the intervention program. Initially, the parents of the participants were informed about the basic principles and aims of this research, giving their signed consent. The filing of Gilliam autism rating scale (GARS) was a necessary condition for the participation of every ASD student before the intervention program. This rating scale is presented in the Appendix section.

Additionally, it should be mentioned that all the students were aware that they could leave the project any time. This option provided them with a sense of safety, stability,

and control over the intervention process. The students who participated in this research were selected by the principal and the teachers at each school and agreed to participate with consent provided by their parents as was previously mentioned Finally, it is important to mention that the name of each participant would not be their real one, as their parents had also agreed to in the signed consent.

Data collection took place during the recess period where spontaneous social interactions took place among the children. The intervention program was applied by a trained Parallel Support Teacher, who was responsible for each of the ASD student's individualized program. The peers who were selected to join the research participated in the same activities as their classmates, and no changes were made to the school environment for the needs of the research.

Peer training sessions took place in empty classrooms during the school program. The data collection of baseline, intervention, and follow-up phase sessions took place during recess in the school yard area. Greek schools have two or three recess periods for students during a school day. The dependent variables started off being counted with continuous recordings in the recess period for about 10 min. It should be mentioned that there were not any changes to the school environment for the needs of the research, and no teachers interfered in the free play condition except for the need to prevent challenging behaviors. The researcher had already trained the observers during a pilot period when she was collecting the data, and they were taking note of the process.

9. Measurement

The measurement took place in twelve sessions. Each session lasted 10 minutes during recess period of every school day. An observation session was starting after the first two hours of lessons when the students were free to play in the school yard. The exception was an ASD girl named "Ioanna" who didn't want to leave the classroom when the school bell was ranging. On those days, the observation lasted two or three minutes less for her and two other teachers of the school were acting as secondary observers to help the first one. The observers had no interaction with the students as they had to be discreet throughout the duration of the research, but they were on hand to intervene in case of any unwanted behavior. The observers nodded to each other at

the beginning of each interval. Data were collected in the form of social interaction which was created from the researcher.

The primary observer was the trained special education teacher who supported the target pupil in school. Secondary observers were the classroom teacher along with one more school staff who agreed to participate in observations in order to help the research for inter-rater agreement. The observers had no interaction with the students as they had to be discreet throughout the duration of the research, but they were on hand to intervene in case of any unwanted behavior. The observers nodded to each other at the beginning of each interval. Data were collected in the form of social interaction which was created from the researcher. The necessary tools for observers were pencils and some filling sheets.

10. Phases of the design

In the beginning of the project, Parallel Support Teachers of ASD students completed the Gilliam autism rating scale (GARS) in cooperation with their parents. This occurred in order to obtain additional information about each ASD student's functioning level. The GARS (Gilliam, 2005) is a parent questionnaire for observing social and communicative behaviors of children who are likely to have autism (Mazefsky & Oswald, 2006). The GARS covers three content areas and focuses on the likelihood of autism: stereotyped behaviors, communication, and social interaction. Its purpose is not to offer a diagnosis but to gather information about the social and communication function of the examinees. In the present study, the experimental procedure included: (a) baseline, (b) intervention phase, and (c) follow-up.

10.1 Baseline

During baseline, the Parallel Support Teacher observed and noted on a special form (presented on section 3.3.2 Dependent variables) the social interactions between the ASD students and their schoolmates through recess and free game periods. This form was designed by the researcher. In this context, all the students had the opportunity to communicate while participating in social interactions. On the contrary, the classroom activities did not consistently encourage social interactions. Neither training or feedback nor prompts or praise were provided by the researcher and school staff about social interactions. The baseline phase was separated in 10-min sessions. In each ASD

student the number of sessions was depended from the period of time that the social behavior was going to be stable. Finally, the researcher collected all the noted forms and analyzed the data.

10.2 Peer Training / Intervention Phase

After the collection of data in the baseline phase, peers were taken by a trained Parallel Support Teacher into a separate room in order to start the training. Students were taken out of classroom activities only at times allowed by the classroom teacher in order to limit the disruption from the school schedule. The peer training occurred in three phases, and each phase lasted from 30 to 40 min. When each training session was completed, peers gained a sticker as a result from their participation in the common interest program. They were unaware about the sticker reward before they received it. Data were not collected during the peer training intervention but during the recess period after the intervention.

Phase 1: The first phase of training consisted of reading and discussing a story about a child with autism (Vakirtzi, 2014). The book describes the characteristics of an ASD child who has typical autistic characteristics. This book allows peers to enter the world of autistic children, learn to decode their "strange" behaviors, and see the world from the autistic child's perspective. After reading the book, a guided conversation began about the importance of peer friendships for children with disabilities in contrast to teachers and adults.

Phase 2: This phase consisted of a discussion about personal interests and the social contact among every group through common preferences. Each group, as was previously mentioned, consisted of one ASD student and five typical peers. The trained teacher loudly asked the group about the best activity/game played during the school recess. The students needed to answer to at least 3 activities/games on paper and then give the paper back with their names written on it. Then, the answers of each student were written in a special form (presented on section 3.6 Data collection instruments), created by the researcher, in order to point out the most common choice. After this, the teachers tried to motivate the group to play the specific activity/game. This phase aimed to bring the peers closer to the ASD student to identify if they had any common preferences that they did not know of before. If something such as this happened, they might have a good chance to play together more and build up a friendship. Additionally,

this phase helps students to recognize that all children with and without disabilities have special abilities and areas of need.

Phase 3: In this phase, the interventionist taught peers strategies to interact with an ASD child. Peers were taught how to prompt the ASD children to use the skill of the day, to encourage target children to ask questions, and to praise the target children for working hard. The interventionist went over the target skill of the week and conducted role-plays with the peers to assess their understanding of the target skill and answer questions. Then, the strategies that the classmates could use to be friends with ASD students were described.

10.3 Follow-Up Phase

In the follow-up phase, there were neither any teacher's feedback nor peer training sessions. In the same setting and conditions of intervention, the children acted naturally without prompt or praise from adults. The interventionists used the same form created by the researcher as in the baseline and intervention phase. Finally, the researcher collected and analyzed data as previously mentioned.

At the end of follow-up phase, we collected the social validity data, which were applied to two different groups. The first consisted of peer participants and the second included teachers. The social validity data were collected through questionnaires conducted by the researcher.

11. Data Analysis strategies

Data analysis was based on visual analysis of graphs, use of descriptive statistical terms, such as mean (mean), standard deviation (SD), percentage of increase or decrease from baseline, intervention, and follow-up phases, which is consistent with single case designs (Kazdin, 2018). The improvement of children's performance was assessed according to the differences observed in the graphs, in the averages, and in the rate of the behavior's modification after the intervention.

12. Reliability - Interobserver agreement

The reliability of the research was guaranteed by checking the level of agreement of the observations of independent observers who provided systematic recording of data variables.

The reliability data collected from two trained school assistants who were aware of the purpose of the study and the experimental phase. In the training of independent observer's, the school assistants were given a manual with the meanings of operations of dependents variables along with data sheets and coding protocols. The independent observers practiced during recess period by observing behaviors of children who won't participate in study.

Two trained observers blind to the purpose of the study were trained to collect the reliability data. The baseline phase included session, depending of each ASD student. Normally, the range of baseline phase was 3 to 5 sessions, the intervention phase included 5 to 8 sessions, and follow-up phase included 3 sessions. The interval recording method was used to calculate the agreement between observers. In this method, which is called "interval-by-interval IOA" all the intervals where both observers agreed with each other were marked. Then, the number of the agreements was divided by the total number of intervals and multiplied by 100. Table 14, 15, 16, 17 and 18 represent the IOA of initiations for each ASD student and Table 19, 20, 21, 22 and 23 represent the IOA of responses. In the IOA method, the symbol "+" was used by the observers for any existence of at least one initiation or response respectively and the symbol "–" for no existence of them.

Overall, as it is shown in Table 24, IOA across groups' initiations was 95.5% (range 93.3–100%) and for responses was 90% (range 85–93.3%). Two low scores for responses (75%) occurred during the fourth observation session of Nikos and Ioanna because of the difficulty in collecting data accurately. The school playground is a natural environment where kids speak loudly, and it is difficult to hear with precision what the children are saying.

Table 14.
IOA - Initiations for Nikos

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12
Observer 1	+	+	+	+	+	+	+	+	+	+	+	+
Observer 2	+	-	+	+	+	+	+	+	+	+	+	+

Table 15.
IOA - Initiations for Dimitris

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11
Observer 1	+	+	+	+	+	+	+	+	+	+	+
Observer 2	+	+	+	+	+	+	+	+	+	+	+

Table 16.
IOA - Initiations for Giorgos

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12
Observer 1	-	+	-	-	+	+	-	+	+	+	+	-
Observer 2	-	+	-	-	+	+	-	+	-	+	+	-

Table 17.
IOA - Initiations for Ioanna

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12	s.13	s.14	s.15	s.16
Observer 1	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+
Observer 2	-	+	-	-	-	+	+	+	+	-	+	+	+	+	+	+

Table 18.
IOA - Initiations for Thanasis

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12	s.13	s.14
Observer 1	-	+	+	+	+	+	+	+	+	+	+	+	+	+
Observer 2	-	-	+	+	+	+	+	+	+	+	+	+	+	-

Table 19.
IOA - Responses for Nikos

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12
Observer 1	+	-	+	-	+	+	+	+	+	+	+	+
Observer 2	+	-	+	+	+	+	+	+	+	+	+	+

Table 20.
IOA - Responses for Dimitris

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11
Observer 1	-	+	+	+	+	+	+	+	+	+	+
Observer 2	-	+	+	+	+	+	+	+	+	+	+

Table 21.
IOA - Responses for Giorgos

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12
Observer 1	+	-	-	+	+	+	+	+	+	+	+	+
Observer 2	+	-	-	+	+	+	+	+	+	+	+	+

Table 22.
IOA - Responses for Ioanna

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12	s.13	s.14	s.15	s.16
Observer 1	-	-	+	-	-	+	-	+	+	+	+	+	+	+	+	+
Observer 2	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+

Table 23.
IOA - Responses for Thanasis

Sessions	s.1	s.2	s.3	s.4	s.5	s.6	s.7	s.8	s.9	s.10	s.11	s.12	s.13	s.14
Observer 1	+	+	-	+	+	+	+	+	+	+	+	+	+	+
Observer 2	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table 24.
IOA for initiations and responses in each phase

		Initiations	Responses
Nikos	Baseline	(3/4) 75%	(3/4) 75%
	Intervention	(5/5) 100%	(5/5) 100%
	Follow-up	(3/3) 100%	(3/3) 100%
	Average	92%	92%
Dimitris	Baseline	(3/4) 75%	(3/3) 100%
	Intervention	(5/5) 100%	(5/5) 100%
	Follow-up	(3/3) 100%	(3/3) 100%
	Average	92%	100%
Giorgos	Baseline	(4/4) 100%	(4/4) 100%
	Intervention	(5/5) 100%	(5/5) 100%
	Follow-up	(3/3) 100%	(3/3) 100%
	Average	100%	100%
Ioanna	Baseline	(4/5) 80%	(4/5) 80%
	Intervention	(6/8) 75%	(7/8) 88%

	Follow-up	(3/3) 100%	(3/3) 100%
	Average	85%	89.3%
Thanasis	Baseline	(2/3) 67%	(2/3) 67%
	Intervention	(8/8) 100%	(8/8) 100%
	Follow-up	(2/3) 67%	(3/3) 100%
	Average	78%	89%
	Total Avrg.	89.4% (range 78% - 100%)	94.1% (range 89% - 100%)

CHAPTER V - RESULTS

1. Common interest activity

Before the intervention, the common interest activity between ASD students and their peers was realized and very interesting results were collected.

Table 25.
Common interest activity for Nikos

Students/Preferences	ASD student 1	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby	bicycle	football	basketball	bicycle	volleyball	football
Favorite food	pizza	souvlaki	pizza	souvlaki	spaghetti	souvlaki
Favorite movie	madagascar	lion king	ice age	madagascar	frozen	lion king
Favorite color	red	red	blue	green	pink	red
Favorite board game	monopoly	guess who	cluedo	monopoly	brain box	monopoly
Favorite animal	pinguin	fish	bird	dog	cat	dog
Favorite subject of school	gymnastic	maths	gymnastic	gymnastic	history	maths
Favorite season	summer	summer	summer	autumn	winter	summer

From the table above (Table 25) it is concluded that Nikos had:

- 2 common interests with peer 1
- 3 common interests with peer 2
- 4 common interests with peer 3
- 0 common interests with peer 4
- 3 common interests with peer 5

Nikos had totally 12 common interests out of 40 with all the peers. More specifically this student had 4 common interests out of 8 with peer 3. It must be mentioned that Nikos had no common interests with peer 4.

Table 26.
Common interest activity for Dimitris

Students/Preferences	ASD student 2	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby	reading ancient greece	basketball	bicycle	basketball	running	dance
Favorite food	souvlaki	souvlaki	pizza	spaghetti	souvlaki	spaghetti
Favorite movie	hercules	spiderman	frozen	batman	aladin	lion king
Favorite color	red	green	white	black	blue	red
Favorite board game	traveling to greece	monopoly	brain box	monopoly	monopoly	jenga
Favorite animal	dinosaur	dog	cat	dog	dinosaur	bird
Favorite subject of school	history	gymnastic	gymnastic	maths	maths	gymnastic
Favorite season	summer	spring	winter	summer	summer	spring

From the table above (Table 26) it is concluded that Dimitris had:

- 1 common interests with peer 1
- 0 common interests with peer 2
- 1 common interest with peer 3
- 3 common interests with peer 4
- 1 common interests with peer 5

Dimitris had totally 6 common interests out of 40 with all the peers. More specifically this student had 3 common interests out of 8 with peer 4. It must be mentioned that Dimitris had no common interests with peer 2.

Table 27.
Common interest activity for Giorgos

Students/Preferences	ASD student 3	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby	running	dance	football	running	basketball	volleyball
Favorite food	spaghetti	potatos	souvlaki	pizza	souvlaki	spaghetti
Favorite movie	batman	beauty and beast	spiderman	spiderman	batman	frozen
Favorite color	grey	red	red	green	grey	black
Favorite board game	battleship	uno	brainbox	puzzle	monopoly	uno
Favorite animal	birds	cat	dog	dog	fish	birds
Favorite subject of school	music	music	gymnastic	maths	gymnastic	history
Favorite season	summer	spring	summer	summer	summer	spring

From the table above (Table 27) it is concluded that Giorgos had:

- 1 common interest with peer 1
- 1 common interest with peer 2
- 2 common interests with peer 3
- 3 common interests with peer 4
- 2 common interests with peer 5

Giorgos had totally 9 common interests out of 40 with all the peers. More specifically this student had 3 common interests out of 8 with peer 4 and 1 common interest with peer 2. It must be mentioned that ASD student 3 had at least 1 common interest with all peers.

Table 28.
Common interest activity for Ioanna

Students/Preferences	ASD student 4	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby	basketball	football	volleyball	basketball	football	running
Favorite food	pizza	souvlaki	pizza	souvlaki	burger	spaghetti
Favorite movie	spiderman	batman	frozen	lion king	spiderman	lion king
Favorite color	blue	blue	pink	green	blue	red
Favorite board game	uno	jenga	guess who	uno	monopoly	brainbox
Favorite animal	dog	dog	cat	dog	fish	lion
Favorite subject of school	arts	gymnastic	music	gymnastic	maths	gymnastic
Favorite season	summer	summer	winter	spring	summer	summer

From the table above (Table 28) it is concluded that Ioanna had:

- 3 common interests with peer 1
- 1 common interest with peer 2
- 3 common interests with peer 3
- 3 common interests with peer 4
- 1 common interest with peer 5

Ioanna had totally 11 common interests out of 40 with all the peers. More specifically this student had 3 common interests out of 8 with 2 peers (peer 1 and peer 3) and had at least 1 common interest with all peers.

Table 29.
Common interest activity for Thanasis

Students/Preferences	ASD student 5	Peer 1	Peer 2	Peer 3	Peer 4	Peer 5
Favorite hobby	football	basketball	football	volleyball	running	basketball
Favorite food	souvlaki	pizza	souvlaki	chicken	burger	souvlaki
Favorite movie	batman	spiderman	thor	frozen	avengers	spiderman
Favorite color	black	red	blue	black	green	red

Favorite board game	chess	uno	monopol y	monopol y	uno	battleshi p
Favorite animal	dinosaur	dog	dog	cat	dinosau r	dog
Favorite subject of school	maτns	gymnasti c	gymnasti c	nιstory	maths	gymnasti c
Favorite season	summer	summer	winter	summer	summer	spring

From the table above (Table 29) it is concluded that Thanasis had:

- 1 common interest with peer 1
- 2 common interests with peer 2
- 2 common interests with peer 3
- 3 common interests with peer 4
- 1 common interest with peer 5

Thanasis had totally 9 common interests out of 40 with all the peers. More specifically this student had 3 common interests out of 8 with peer 4. It must be mentioned that ASD student 5 had at least 1 common interest with all peers.

2. Initiations – Responses

The purpose of this study was to investigate the effectiveness of a low-intensity PMI intervention on the social-communication behaviors of elementary school students with ASD during school recess. The following sections describe the results for initiations and responses between ASD students and their peers. After these results, the social validity results of peers and teachers are also presented.

In figures 1-5 the left vertical axe represents the rates of initiations for each ASD student towards his/her peers while the right vertical axe represents the rates of responses for each ASD student from his/her peers. The rates of the responses are measured in percentages as we mentioned before, so they are represented as decimal numbers.

2.1. Group 1: Nikos

Figure 1.
Frequency of initiations and responses for Nikos

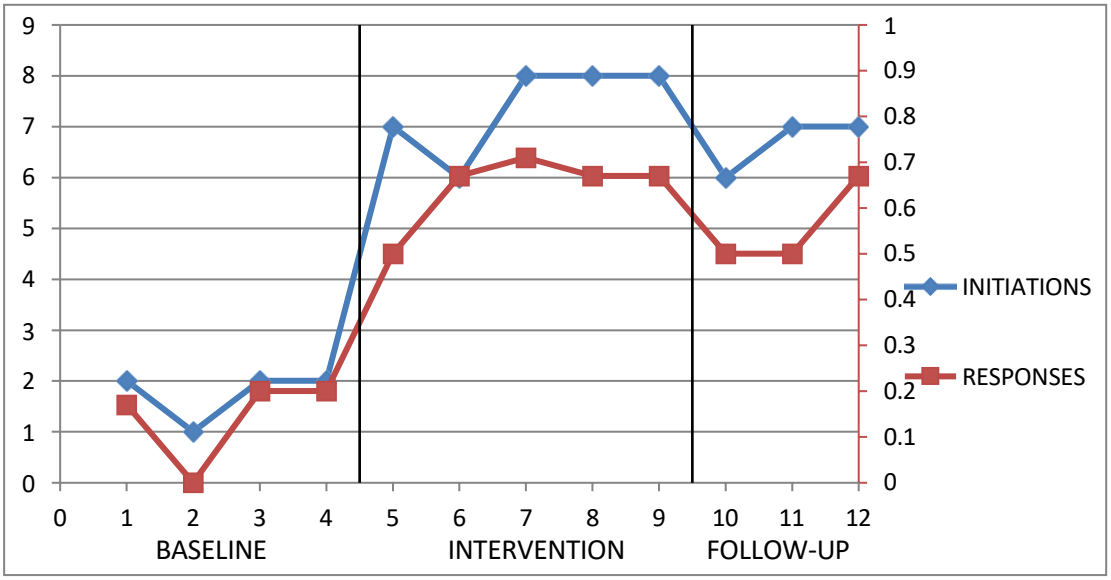


Figure 1 shows the results of initiations and responses during baseline, intervention and follow-up phases for Nikos. During baseline, Nikos' average of initiations towards peers was 1.75 (range 1-2), in intervention phase 7.4 (range 6-8) and in follow-up phase 6.7 (range 6-7). As concerning the responses, during baseline Nikos's average towards his peers was 0.14 (range 0-0.2), during intervention 0.64 (range 0.5-0.71) and in follow up phase 0.56 (range 0.5-0.67). It is concluded that Nikos showed an increase in initiations and responses in both intervention and follow up phase. Over all sessions, the standard deviation of initiations was 2.74, with an overall mean of 5.33. The standard deviation of responses was 0.25, with an overall mean of 0.46.

2.2 Group2: Dimitris

Figure 2.
Frequency of initiations and responses for Dimitris

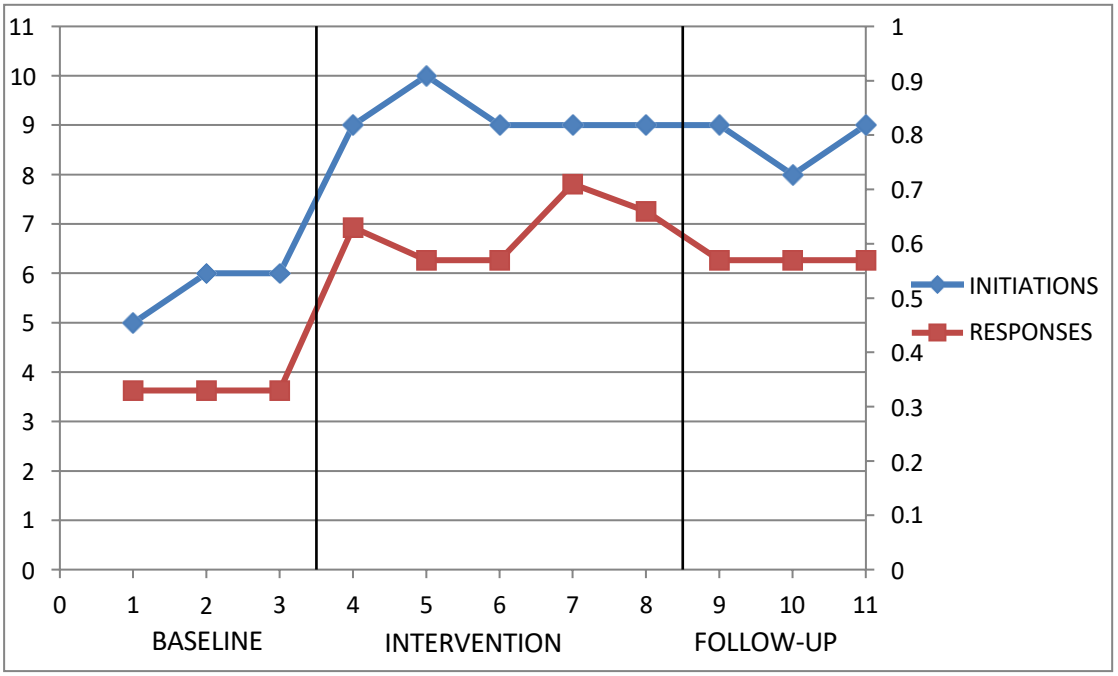


Figure 2 shows the results of initiations and responses during baseline, intervention and follow-up phases for Dimitris. During baseline, Dimitris' average of initiations towards peers was 5.67 (range 5-6), during intervention phase 9.2 (range 9-10) and in follow-up phase 8.67 (range 8-9). During baseline, Dimitris' average of responses towards his peers was 0.33 (range 0.33), during intervention 0.63 (range 0.57-0.71) and in follow up phase 0.57 (range 0.57). It is concluded that Dimitris showed an increase in initiations and responses in intervention that was also continued in the follow up phase. Over all sessions, the standard deviation of initiations was 1.64, with an overall mean of 8.09. The standard deviation of responses was 0.14, with an overall mean of 0.53.

2.3 Group3: Giorgos

Figure 3.
Frequency of initiations and responses for Giorgos

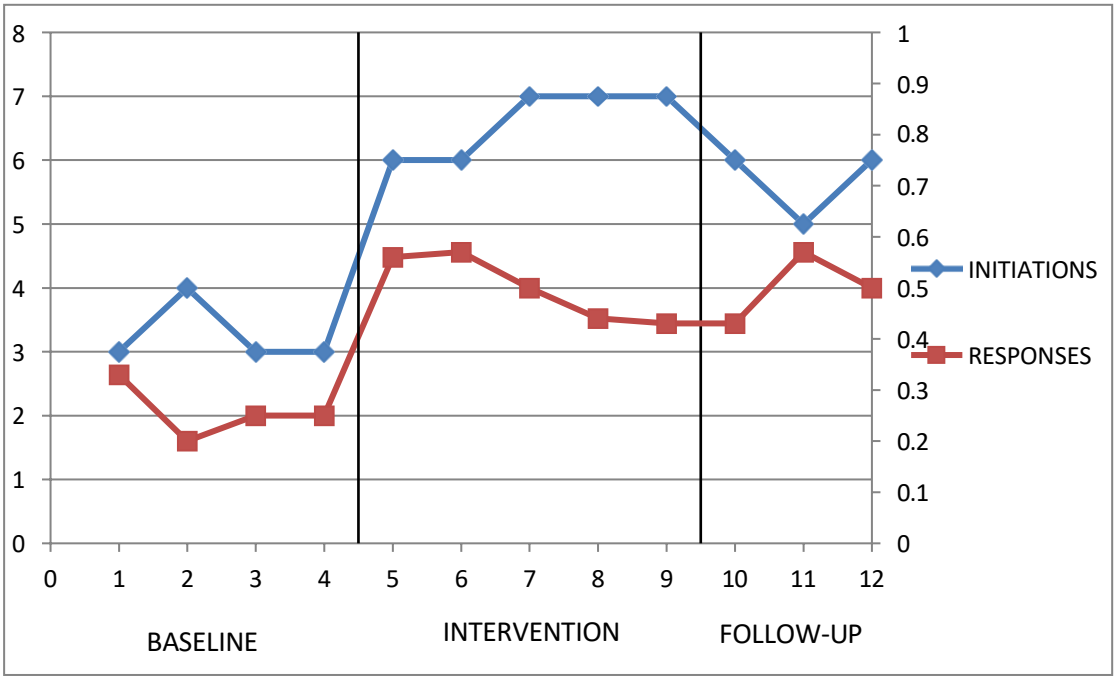


Figure 3 shows the results of initiations and responses during baseline, intervention and follow-up phases for Giorgos. During baseline, Giorgos' average initiations towards peers was 3.25 (range 2-4). During intervention phase, Giorgos' average initiations was 6.6 (range 6-7). In follow-up phase, Giorgos' average initiations was 5.67 (range 5-6). During baseline, Nikos's average responses towards his peers was 0.26 (range 0.2-0.33). During intervention, Giorgos' average responses was 0.5 (range 0.43-0.57) and in follow up phase the average of Giorgos' responses was 0.5 (range 0.43-0.57). It is concluded that Giorgos showed an increase in initiations and responses in intervention that was also continued in the follow up phase. Over all sessions, the standard deviation of initiations was 1.6, with an overall mean of 5.25. The standard deviation of responses was 0.13, with an overall mean of 0.42.

2.4 Group 4: Ioanna

Figure 4.
Frequency of initiations and responses for Ioanna

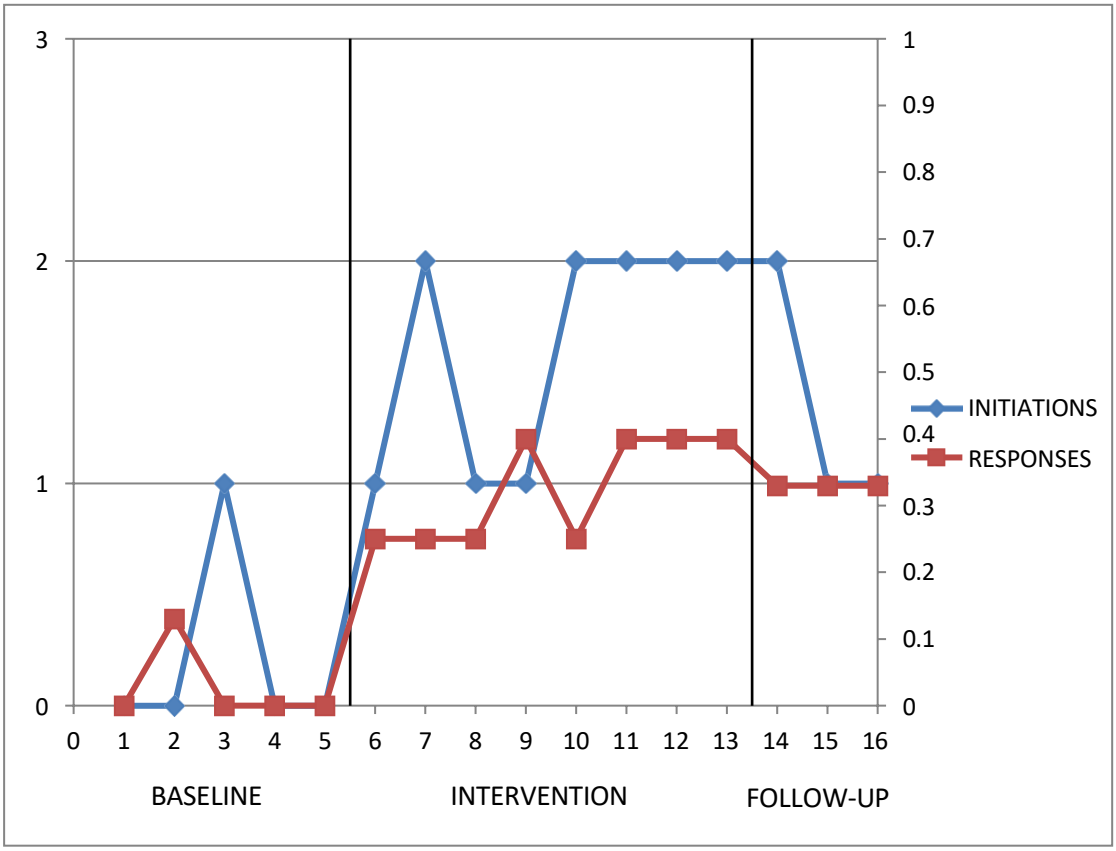


Figure 4 shows the results of initiations and responses during baseline, intervention and follow-up phases for Ioanna. During baseline, Ioanna's average of initiations towards peers was 0.2 (range 0-1), during the intervention phase 1.63 (range 1-2) and in follow-up phase 1.33 (range 1-2). During baseline, Ioanna's average of responses towards his peers was 0.02(range 0 -0.13), during intervention 0.33 (range 0.25-0.4) and in follow up phase 0.33 (range 0.33). It is concluded that Ioanna showed an increase in initiations and responses in intervention that was also continued in the follow up phase. Over all sessions, the standard deviation of initiations was 0.81, with an overall mean of 1.13. The standard deviation of responses was 0.16, with an overall mean of 0.23.

2.5 Group5: Thanasis

Figure 5.
Frequency of initiations and responses for Thanasis

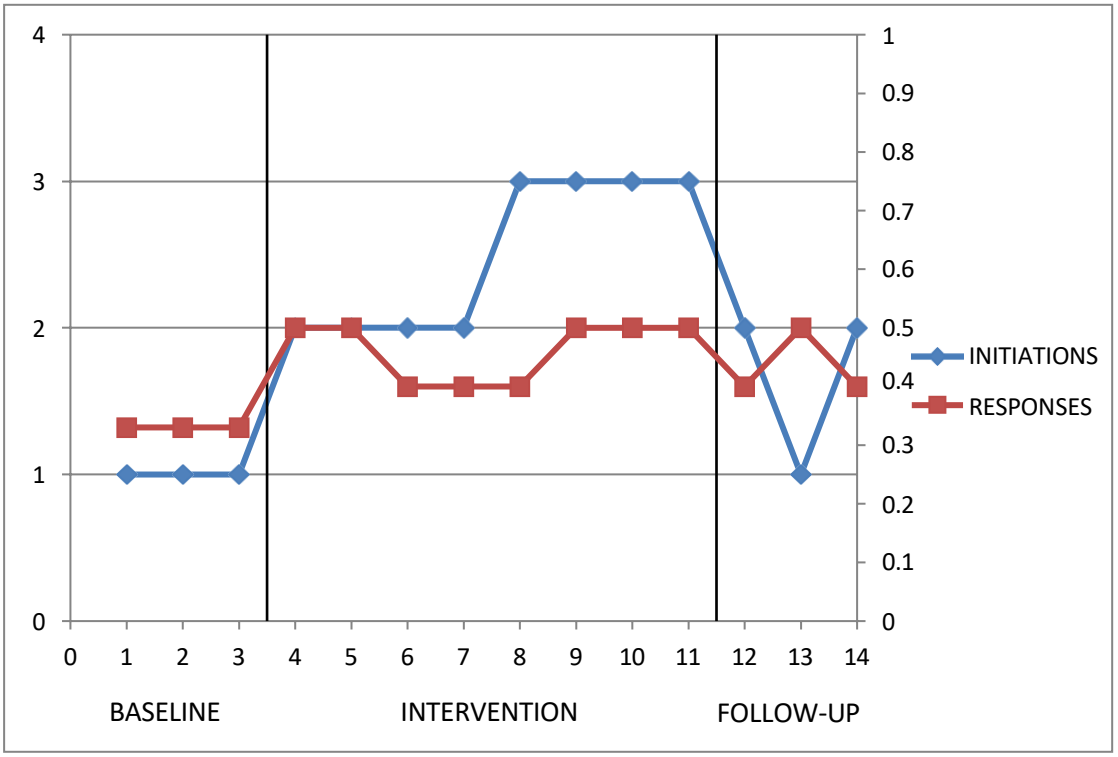


Figure 5 shows the results of initiations and responses during baseline, intervention and follow-up phases for Thanasis. During baseline, Thanasis' average initiations towards peers were 1 (range 1). During intervention phase, Thanasis' average initiations was 2.5 (range 2-3). In follow-up phase, Thanasis' average initiations was 1.67 (range 1-2). During baseline, Thanasis' average responses towards his peers was 0.33 (range 0.33). During intervention, Thanasis average responses was 0.46 (range 0.4-0.5) and in follow up phase the average of Thanasis' responses was 0.43 (range 0.4-0.5). It is concluded that Thanasis showed an increase in initiations and responses in intervention that was also continued in the follow up phase. Over all sessions, the standard deviation of initiations was 0.78, with an overall mean of 2. The standard deviation of responses was 0.07, with an overall mean of 0.43.

3. Social validity

At the end of follow-up, phase we collected the social validity data. Two questionnaires were granted at teachers and peers who participated in intervention which they should complete according to their opinion for study. The measurement of social validity included six closed-ended questions/fields that were rated on five-point Likert-type scale (i.e., 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree). Tables 30 and 31 display the results for peer participants' and for teachers' social validity. All of the teachers and the peer participants in all three groups rated the intervention experience quite positively. All of the peer participants stated clearly that they could understand more about ASD students, which was one of the goals during the

PMI program. Additionally, most of the peers from then onward would consider their ASD classmate a friend, answering with a mean of 4.27 out of 5. Generally, all five groups of peers gave positive answers concerning ASD students and the package of PMI—intervention program, which is shown from the means at Table 30. All comments from teachers were also positive (e.g., "This program increases the interaction between the target child and peer participants", "This strategy was helpful to me as teacher", "I would recommend this strategy to another teacher who has a student with ASD"). These means were absolutely positive as Table 31 shows while the rest of the questions were also positive with means near to five out of five.

According to Kazdin (2005), the social validity in any research is very important for three reasons. Firstly, various effective techniques for facing problematic behaviors may not be equally acceptable to the person who receives the treatment. Secondly, breaching the rights of the people receiving the treatments should be avoided, and thirdly, the identification of specific variables could influence the acceptability of treatments.

Table 30.
Peers' Social validity (Range)

	Group 1	Group 2	Group 3	Group 4	Group 5	Mean
I have fun during training period.	5.0 (5.0)	4.2 (3.0-5.0)	5.0 (5.0)	5.0 (5.0)	4.4 (4.0-5.0)	4.72
This participation has an impact in my social life.	1.0 (1.0)	1.4 (1.0-2.0)	1.0 (1.0)	1.4 (1.0-2.0)	1.0 (1.0)	1.16
I consider my classmate with ASD my friend now.	4.4 (4.0-5.0)	4.8 (4.0-5.0)	4.2 (3.0-5.0)	3.6 (3.0-5.0)	4.4 (4.0-5.0)	4.28
If asked, I would volunteer again in a same project.	5.0 (5.0)	4.4 (4.0-5.0)	5.0 (5.0)	4.2 (3.0-5.0)	5.0 (5.0)	4.72
I feel that I can understand more about	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5

students with ASD.						
This participation was valuable use of my school time.	5.0 (5.0)	4.8 (4.0-5.0)	5.0 (5.0)	4.4 (4.0-5.0)	5.0 (5.0)	4.84

Table 31.
Teachers' Social validity (Range)

	Group 1	Group 2	Group 3	Group 4	Group 5	Mean
This strategy was helpful to me as teacher.	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5
This program increases the interaction between the target child and peer participants.	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5
The strategy was easy to implement.	4.5 (4.0-5.0)	4.0 (3.0-5.0)	4.5 (4.0-5.0)	4.0 (3.0-5.0)	4.0 (4.0)	4.2
The student with ASD has more friends thanks to this program.	5.0 (5.0)	4.0 (4.0)	5.0 (5.0)	4.0 (4.0)	5.0 (5.0)	4.6
I would use this strategy again in the future.	5.0 (5.0)	5.0 (5.0)	4.0 (4.0)	5.0 (5.0)	4.0 (4.0)	4.6
I would recommend this strategy to another teacher who has a	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5.0 (5.0)	5

student with ASD.						

4. Discussion

This study was conducted to enhance peer-to-peer social skills in five elementary ASD students and twenty-five peers from general education classrooms. Important evidence of this research was (a) the use of a common interest activity to increase social interactions between peers and ASD students; (b) the use of a school setting to increase social interactions among students with ASD and their typical peers; and (c) the fact that the intervention program will be applied by the school staff. Confirming the previous research on PMI, the current study demonstrates that peer training can be a useful strategy for increasing interactions between typical peers and students with ASD (Brain & Mirenda, 2019; Owen et al.,2008; Chung et al., 2007; Kamps et al., 2002; Kohler et al., 2007; Lee et al., 2007; Sainato et al., 1987).

Results indicated that the social skills intervention had direct and vigorous improvements on social initiations and responses in all five participants. Social interaction was investigated in recess period among typical developing peers and ASD students after the implementation of PMI program. Results showed that the intervention significantly and substantially increased interactions between students with ASD and their peers. Improvements in the measurement of social interactions were large and despite the different ways that typically developing children socialize, the ASD children succeeded to interact with them and started interactions. Some changes were noticed in all study variables, keeping up a positive slant within the rates of initiating and responding to interactions, and a negative slant within the rate of time the ASD students maintained low interactions. Results maintained during follow-up phase with some decrease in their value from the intervention phase. This research had the advantage of evaluating training in school, which is the most naturalistic setting while simultaneously giving school staff the opportunity to implement the intervention. Intervention procedures required the collection of data during the free play period of school recess, and school professionals had no difficulty to access that program. At the end of study, we selected social validity data where teachers reported that they had no difficulty with the procedures of intervention, and they found it easy to apply in school. Peer participants reported positive things about their experience, too. Social validity ratings were high for both peer participants and classroom teachers and this study extend the previous research by demonstrating the effectiveness of PMI applied from school staff in a natural school setting. It should be noticed that the implementers of intervention were not research staff for the need of the study, but they already worked in the public schools and taught the target students of the study.

As far as the results of this study are concerned, it is concluded that there is an emerging need to provide multiple opportunities for social interactions, not only in non-academic

social groups but also in group settings with academic activities. According to Krier and Labros (2020), by providing chances for interaction with typical peers, ASD students have higher possibilities of responding and participating in activities. This comes in line with our research, as all five ASD students showed more frequent participation in activities during school time. A similar condition was noticed in their responses and initiations, too. In these results, the training of peers in combination with a common interest activity, often helped them to create more contacts with ASD students. This happened because, during the common interest activity, peers realized some common preferences with their ASD classmates. Newcomb and Bagwell (1995) support that children often define friendship in terms of mutual enjoyment of a preferred activity. A characteristic example was that after the intervention most of the students from Dimitris's classroom were playing the "game of hide-and-seek" for many days, which was his favorite game. This was confirmed from the follow-up phase of Dimitris's, where responses and initiations ranged at similar levels with the intervention phase. These findings are significant because ASD students could have more frequent interactions and responses with their peers building stronger friendships than before (Sivaraman & Fahmie, 2018; Jobe et al., 2007; Howlin, 2000; Feld, 1982). Additionally, it has been noted from Pierce and Schreibman (1995) that the failure to engage in social behaviors that are often observed in ASD may be related to a lack of motivation. These promising results showed that school staff could use this intervention package in order to strengthen their students' relationship and simultaneously help the ASD children to interact with peers. These findings confirm and expand the previous studies of PMI indicating positive social outcomes of students with ASD (Krier & Lambros, 2020; Watkins et al., 2019; Brain & Mirenda, 2019; Chan et al., 2009).

During baseline, due to the low rates of social initiations and responses, it is observed that all five ASD participants are socially isolated in school recess. These findings confirm the previous references showing that students with ASD are socially isolated and experienced higher levels of victimization than more socially impaired children at schools (Rowley et al., 2012). Before the intervention program, Nikos, according to Gars-2 scale had 13 standard score in communication section and 12 in social interaction section. Overall, his score was 115 Autism Index in Gars-2 scale. In the common interest activity, Nikos had 12 common interests out of 40 with his peers. Actually, Nikos had 4 common interests out of 8 with peer 3. After the results of all three phases, this ASD student showed great increase in initiations and responses both during the intervention phase and the follow–up phase in relation to baseline phase. The mean of initiations was at 1.75 units in baseline phase and was increased to 7.4 units in intervention phase. Also, a progress was noticed in follow-up phase too by almost 5 units comparing with baseline phase (from 1.75 to 6.67). As regarding the responses, Nikos showed also an increase, as in the baseline phase the mean was 14% and in the intervention phase it reached 64%. In the follow-up phase he also showed an increase by 42% in relation to the baseline phase (from 14% to 56%).

As concerning Dimitris, according to Gars-2 scale, he had 10 standard score in communication section and 10 in social interaction section. Overall, his score was 100 Autism Index in Gars-2 scale. In the common interest activity, Dimitris had only 6 common interests out of 40 with his peers. Actually, Dimitris had 3 common interests out of 8 with peer 4. After the results of all three phases, this ASD student showed great increase in initiations and responses both during the intervention phase and the follow–up phase in relation to baseline phase. The mean of initiations was at 5.67 units in baseline phase and was increased to 9.2 units in intervention phase. Also, a progress was noticed in follow-up phase too by almost 3 units comparing with baseline phase (from 5.67 to 8.67). As regarding the responses, Dimitris showed also an increase, as in the baseline phase the mean was 33% and in the intervention phase it reached 63%. In the follow- up phase he also showed an increase by 24% in relation to the baseline phase (from 33% to 57%).

Giorgos, according to Gars-2 scale, he had 10 standard score in communication section and 11 in social interaction section. Overall, his score was 103 Autism Index in Gars-2 scale. In the common interest activity, Giorgos had 9 common interests out of 40 with his peers. Actually, Giorgos had 3 common interests out of 8 with peer 3 and at least 1 with all the rest peers. After the results of all three phases, this ASD student showed great increase in initiations and responses both during the intervention phase and the follow–up phase in relation to baseline phase. The mean of initiations was at 3.25 units in baseline phase and was increased to 6.6 units in intervention phase. Also, a progress was noticed in follow-up phase too by almost 3 units comparing with baseline phase (from 3.25 to 5.67). As regarding the responses, Giorgos showed also an increase, as in the baseline phase the mean was 26% and in the intervention phase it reached 50%. In the follow- up phase he also showed an increase by 24% in relation to the baseline phase (from 26% to 50%).

Another ASD student, Ioanna, according to Gars-2 scale, she had 15 standard score in communication section and 16 in social interaction section. Overall, his score was 132 Autism Index in Gars-2 scale. In the common interest activity, Ioanna had 11 common interests out of 40 with his peers. She and Nikos were the only ASD student who had so many common interests with their peers. Actually, Ioanna had 3 common interests out of 8 with peer 1, peer 3, peer 4 and 1 common interest with peer 2 and peer 5. After the results of all three phases, this ASD student showed great increase in initiations and responses both during the intervention phase and the follow–up phase in relation to baseline phase. The mean of initiations was at 0.2 units in baseline phase and was increased to 1.63 units in intervention phase. Also, a progress was noticed in follow-up phase too by 1 unit comparing with baseline phase (from 0.2 to 1.33). As regarding the responses, Ioanna showed also an increase, as in the baseline phase the mean was 3% and in the intervention phase it reached to 33%. In the follow-up phase she also showed an increase by 30% in relation to the baseline phase (from 3% to 33%).

Lastly, Thanasis, according to Gars-2 scale, he had 11 standard score in communication section and 11 in social interaction section. Overall, his score was 106 Autism Index in

Gars-2 scale. In the common interest activity, Thanasis had 9 common interests out of 40 with his peers. Actually, Thanasis had 3 common interests out of 8 with peer 4 and at least 1 with all the rest peers. After the results of all three phases, this ASD student showed great increase in initiations and responses both during the intervention phase and the follow–up phase in relation to baseline phase. The mean of initiations was at 1 unit in baseline phase and was increased to 2.5 units in intervention phase. Also, a progress was noticed in follow-up phase too by almost 1 unit comparing with baseline phase (from 1 to 1.67). As regarding the responses, Thanasis showed also an increase, as in the baseline phase the mean was 33% and in the intervention phase it reached to 46%. In the follow- up phase he also showed an increase by 10% in relation to the baseline phase (from 33% to 43%).

There are several factors that may have contributed to the success of the intervention. Firstly, the training of peers included information of how to respond effectively in their interactions with ASD students. Also, the increased frequency of initiations by ASD students could be a reason that gave peers more opportunities to respond. In addition, the common interest activity gave to all students the chance to express their interests and start conversation about them. Lastly, the implement of intervention from the school staff leads all students feel comfortable with the process of the interventions. Then, the providing feedbacks from their teachers boosted their confidence. These are shown by the social validity rates in the group of peers. More specifically, in the questions/fields “I have fun during training period”, “If asked, I would volunteer again in a same project’ and “This participation was valuable use of my school time” the rate was really high and close to 5 which was the highest rate (4.72,4.72 and 4.84 respectively).

5. Implications and Limitations

The referred results, show that all of five ASD students increased their social interaction regarding their initiations and their responses to their peers. Nikos, an ASD student with higher Autism Index (115) than the other three ASD students, had the highest improvement in his measurements comparing with all five ASD students. He had also the most common interests with his peers during the intervention phase. So, common interest activity could be a sign that affected his measurements. As Bambara et al. (2021) mention, PMI based on common interests can successfully help to introduce and maintain topics of conversation of relevance and interest to conversation partners among ASD adolescents.

On the other hand, Ioanna, who had the highest Autism index (132) in Gars-2 scale, showed the lowest improvement in her measurements, although she had many common interests with her peers. Ioanna, before the intervention, according to her teachers was low-functioning without any social interactions with peers. This comes in line with the results of the measurements in baseline phase. Finally, Thanasis and Giorgos, two ASD students with the lowest Autism Index (106 and 103) had lower improvement in their

measurements comparing with Ioanna who had higher Autism Index (132). These students before and during the intervention had already some social interactions with their peers.

The results from the current investigation are representative of such a need for additional training components. Future research should also consider whether deficits in social interaction are caused by a skill deficit (i.e., lack of ability) or a performance deficit (lack of interest or motivation) when developing interventions for children with ASD. Also, future studies should provide more evidence about the ASD participants characteristics. Specifically, they need to report the functioning level and ethnicity of ASD participants in order to know for whom PMI strategies will be most efficient and the researcher could better interpret the problematic child's social behaviors if they have. Furthermore, there is a need to expand the literature of PMI in out of school settings in order to broaden the socialization of ASD children and check if the effects of PMI can generalize in different environments. Last but not least, it could be beneficial to investigate the effects of PMI in adults with ASD by involving training procedures related to friendship and social participation, and well-being.

Furthermore, it is very important to refer the pilot research that had been realized prior to the main study, where the researcher applied the ABA methodology design to three ASD students. Even though the ABA design is more powerful than the basic AB design from an experimental point of view (Gast & Ledford, 2018), there is a concern that the limited phase changes may lead to an observation effect that coincides with external conditions (Tanious & Onghena, 2019). It is significant that Barlow et al. (2009) noted that ABA design is "experimental," while others (Kazdin, 2011) suggested the ABAB design as necessary step to meet the conditions of experimental criterion. Furthermore, Johnston and Pennypacker (2009), authors of the leading behavior analysis, cleared that the ABA design provides only "preliminary evidence" related to the reliability of the treatment effect and added that even the ABAB design is problematic in drawing firm conclusions. This design does not provide reassurance that the independent variable is responsible for the associated changes in responding. Anyone could argue that these selected behavioral changes are due to external factors initiated by or selectively associated with the independent variable, and we would have no evidence for a convincing rebuttal. Also, researchers may sometimes find this a difficult constraint to accept. When someone has planned and implemented already a study and have noticed everything closely from day to day, it is tempting to believe that the independent variable embedded in the intervention condition is absolutely responsible for the observed changes in responding. Even colleagues reading a published article of the study might want to make the same hypothesis, especially if they are also interested in a specific outcome. Nevertheless, the fact of the matter is that neither an ABA nor ABAB design establishes a functional relation because it does not face the role of external factors selectively associated with the independent variable (Johnston & Pennypacker, 2009, pp. 264–265). When implemented with multiple design features (e.g., within- and between-case comparisons), SCDs can lead towards a strong basis for

causal inference, especially given considerations of internal validity threats (R. H. Horner et al., 2005) So, the multiple baseline design was finally applied instead of ABA design.

The presented study has some limitations. Even though the intervention program showed an increase in social interaction among ASD students and peers, generalization data were not assessed. ASD students can become socially functional when the social behavior techniques are generalized beyond training conditions (Stokes & Baer, 1977). For this reason, progress toward the inclusion of ASD students can be assisted by generalizing the PMI goals in other natural settings, such as a private playground where peers are not guided or supervised by adults. Most of the PMI studies, such as the one presented, focus on exploring the effects of this approach in functional students with ASD where the possibility of interaction with classmates is greater. Future research on PMI should examine the effect of this approach for non-verbal or other low-functioning students with ASD. Additionally, researchers could analyze the quality of peer interactions to measure the duration of interactive play. The continuing research on PMI strategy could provide important guidance and strengthen the findings for new skills in the social acceptance of ASD children in inclusive settings.

6. Conclusions

In any case, as it is noted at Michalopoulou et al. (2022), "this intervention package provides a promising approach to enhance social skills in ASD students promoting progress in acceptance and inclusion of students with ASD. The study presented also conduces to the literature by proving how peer training in combination with activities based on students' common interests can be easily used by the teachers in a school setting."

The presenting study reproduced and extended the previous research of PMI by demonstrating that this approach can successfully increase interactions between students with ASD and their peers. This intervention has the benefit of school staff's participation and the verification of effectiveness by several subjects in different grades and in different schools. However, a greater number of peer participants in each social group may lead students to model more social skills and generalize the learning of the intervention with peers in several settings (Michalopoulou et al., 2022). Additionally, the presented research has unclear results about untrained classmates of an ASD student. It would be interesting for a future study to generalize the results in untrained peers and further explore the peers' benefits and experience of being surveyed via personal interviews.

The continuing research on PMI strategy could provide important guidance and strengthen the findings for new skills in the social acceptance of ASD children in inclusive settings.

References

Able, H., Sreckovic, M. A., Schultz, T. R., Garwood, J. D., & Sherman, J. (2014). Views from the Trenches: Teacher and Student Supports Needed for Full Inclusion of Students with ASD. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children*, *38*(1), 44–57. https://doi.org/10.1177/0888406414558096

Agaliotis, I., & Kalyva, E. (2011). A survey of Greek general and special education teachers' perceptions regarding the role of the special needs coordinator: Implications for educational policy on inclusion and teacher education. *Teaching and Teacher Education*, *27*(3), 543-551.

Alberto, P., & Troutman, A. C. (2013). *Applied behavior analysis for teachers*. Pearson.

Alcover, C., Mairena, M. Á., Mezzatesta, M., Elias, N., Díez-Juan, M., Balañá, G., ... & Arias-Pujol, E. (2019). Mixed methods approach to describe social interaction during a group intervention for adolescents with autism spectrum disorders. *Frontiers in Psychology*, *10*, 1158.

Alnahdi, G. H. (2015). Single-subject designs in special education: advantages and limitations. *Journal of Research in Special Educational Needs*, *15*(4), 257-265.

Aldabas, R. (2020). Effectiveness of peer-mediated interventions (PMIs) on children with autism spectrum disorder (ASD): a systematic review. *Early Child Development and Care*, *190*(10), 1586-1603. https://doi.org/10.1080/03004430.2019.1580275

American Psychiatric Association. Task Force on DSM-IV. (1994). *Dsm-iv sourcebook*. American Psychiatric Pub.

American Psychiatric Association. (2013). *DSM-5 TM guidebook the essential companion to the Diagnostic and statistical manual of mental disorders, fifth edition* (5th ed.). Washington, Dc American Psychiatric Publishing.

Anderson, A., Moore, D. W., Godfrey, R., & Fletcher-Flinn, C. M. (2004). Social skills assessment of children with autism in free-play situations. *Autism*, *8*(4), 369-385. https://doi.org/10.1177/1362361304045216

Apteslis, N., Mitropoulou, E., & Tsakpini, K. (2012). Educational Assessment Tool for children with Autism in the Social Skills Sector. Available in: http://www.specialeducation.gr/frontend/index.php

Ashburner, J., Ziviani, J., & Rodger, S. (2010). Surviving in the mainstream: Capacity of children with autism spectrum disorders to perform academically and regulate their emotions and behavior at school. *Research in Autism Spectrum Disorders*, *4*(1), 18–27. https://doi.org/10.1016/j.rasd.2009.07.002

Avramidis, E., Bayliss, P., & Burden, R. (2000). A survey into mainstream teachers' attitudes towards the inclusion of children with special educational needs in the ordinary school in one local education authority. *Educational Psychology*, *20*, 191-211.

Bambara, L. M., Cole, C. L., Telesford, A., Bauer, K., Bilgili-Karabacak, I., Weir, A., & Thomas, A. (2021). Using peer supports to encourage adolescents with autism spectrum disorder to show interest in their conversation partners. *Journal of Speech, Language and Hearing Research*, *64*(12), 4845-4860.

Banda, D. R., Hart, S. L., & Liu-Gitz, L. (2010). Impact of training peers and children with autism on social skills during center time activities in inclusive classrooms. *Research in Autism Spectrum Disorders*, *4*(4), 619–625. https://doi.org/10.1016/j.rasd.2009.12.005

Baron-Cohen, S., & Bolton, P. (1993). *Autism: the facts*. Oxford University Press.

Bauminger, N., & Kasari, C. (2000). Loneliness and Friendship in High-Functioning Children with Autism. *Child Development*, *71*(2), 447–456. https://doi.org/10.1111/1467-8624.00156

Beglinger, L., & Smith, T. (2005). Concurrent Validity of Social Subtype and IQ after Early Intensive Behavioral Intervention in Children with Autism: A Preliminary Investigation. *Journal of Autism and Developmental Disorders*, *35*(3), 295–303. https://doi.org/10.1007/s10803-005-3292-3

Bellini, S., & Hopf, A. (2007). The Development of the Autism Social Skills Profile. *Focus on Autism and Other Developmental Disabilities*, *22*(2), 80–87. https://doi.org/10.1177/10883576070220020801

Bene, K., Banda, D. R., & Brown, D. (2014). A Meta-analysis of Peer-Mediated Instructional Arrangements and Autism. *Review Journal of Autism and Developmental Disorders*, *1*(2), 135–142. https://doi.org/10.1007/s40489-014-0014-9

Benítez-Burraco, A., & Murphy, E. (2016). The Oscillopathic Nature of Language Deficits in Autism: From Genes to Language Evolution. *Frontiers in Human Neuroscience*, *10*. https://doi.org/10.3389/fnhum.2016.00120

Bibby, P., Eikeseth, S., Martin, N. T., Mudford, O. C., & Reeves, D. (2002). Progress and outcomes for children with autism receiving parent-managed intensive interventions. *Research in Developmental Disabilities*, *23*(1), 81–104. https://doi.org/10.1016/s0891-4222(02)00095-1

Boutot, E. A., & Bryant, D. P. (2005). Social integration of students with autism in inclusive settings. *Education and Training in Developmental Disabilities*, *40*(1)14-23.

Boyd, R. D., & Corley, M. J. (2001). Outcome Survey of Early Intensive Behavioral Intervention for Young Children with Autism in a Community Setting. *Autism*, *5*(4), 430–441. https://doi.org/10.1177/1362361301005004007

Brain, T., & Mirenda, P. (2019). Effectiveness of a low-intensity peer-mediated intervention for middle school students with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *62*, 26–38. https://doi.org/10.1016/j.rasd.2019.02.003

Breitenbach, M. M., Armstrong, V. L., & Bryson, S. E. (2013). The implementation of best education practices for a student severely affected by autism. *International Journal of Inclusive Education*, *17*(3), 277–294. https://doi.org/10.1080/13603116.2012.676087

Byiers, B. J., Reichle, J., & Symons, F. J. (2012). Single-Subject Experimental Design for Evidence-Based Practice. *American Journal of Speech-Language Pathology*, *21*(4), 397–414. https://doi.org/10.1044/1058-0360(2012/11-0036)

Camargo, S. P. H., Rispoli, M., Ganz, J., Hong, E. R., Davis, H., & Mason, R. (2014). A Review of the Quality of Behaviorally-Based Intervention Research to Improve Social Interaction Skills of Children with ASD in Inclusive Settings. *Journal of Autism and Developmental Disorders*, *44*(9), 2096–2116. https://doi.org/10.1007/s10803-014-2060-7

Cappadocia, M. C., J. A. Weiss, and D. Pepler. 2012. Bullying Experiences Among Children and Youth with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders 42*(2): 266–277.

Carter, E. W., Gustafson, J. R., Sreckovic, M. A., Dykstra Steinbrenner, J. R., Pierce, N. P., Bord, A., ... & Mullins, T. (2017). Efficacy of peer support interventions in general education classrooms for high school students with autism spectrum disorder. *Remedial and Special Education*, *38*(4), 207-221.

Carter, A. S., Davis, N. O., Klin, A., & Volkmar, F. R. (2005). Social development in autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior* (pp. 312–334). John Wiley & Sons, Inc..

Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, *3*(4), 876–889. https://doi.org/10.1016/j.rasd.2009.04.003

Chang, Y.-C., & Locke, J. (2016). A systematic review of peer-mediated interventions for children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *27*, 1–10. https://doi.org/10.1016/j.rasd.2016.03.010

Chapin, S., Boyle, S., Babb, S., & McNaughton, D. (2018). Effects of Peer Support Interventions on the Communication of Preschoolers with Autism Spectrum Disorder: A Systematic Review. *Seminars in Speech and Language*, *39*(05), 443–457. https://doi.org/10.1055/s-0038-1670670

Charlop-Christy, M. H., Carpenter, M., Le, L., LeBlanc, L. A., & Kellet, K. (2002). Using the picture exchange communication system (PECS) with children with autism: Assessment of PECS acquisition, speech, socialcommunicative behavior and problem behavior. *Journal of Applied Behavior Analysis, 35*(3), 213-231.

Charlop-Christy, M. H., Le, L., & Freeman, K. A. (2000). A comparison of video modeling with in vivo modeling for teaching children with autism. *Journal of Autism and Developmental Disorders*, *30*(6), 537–552. https://doi.org/10.1023/a:1005635326276

Chen, M., Hyppa-Martin, J. K., Reichle, J. E., & Symons, F. J. (2016). Comparing Single Case Design Overlap-Based Effect Size Metrics From Studies Examining Speech Generating Device Interventions. *American Journal on Intellectual and Developmental Disabilities*, *121*(3), 169–193. https://doi.org/10.1352/1944-7558-121.3.169

Christensen, D. L., Baio, J., Braun, K. V. N., Bilder, D., Charles, J., Constantino, J. N., … Yeargin-Allsopp, M. (2016). Prevalence and characteristics of autism spectrum disorder among children aged 8 years—Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2012. *Morbidity and Mortality Weekly Report Surveillance Summaries, 65(3), 1–23.*

Chung, K.-M., Reavis, S., Mosconi, M., Drewry, J., Matthews, T., & Tassé, M. J. (2007). Peer-mediated social skills training program for young children with high-functioning autism. *Research in Developmental Disabilities*, *28*(4), 423–436. https://doi.org/10.1016/j.ridd.2006.05.002

Commission On Behavioral And Social Sciences And Education. (2001). *Educating children with Autism*. National Academy Press.

Constantarea, M. (2001). Childhood Autism. In Tsiantis, G. and Manolopoulos, S. (Eds.) *Contemporary Issues in Child Psychiatry.* Kastaniotis Publications.

Courchesne, E., Yeung-Courchesne, R., Hesselink, J. R., & Jernigan, T. L. (1988). Hypoplasia of Cerebellar Vermal Lobules VI and VII in Autism. *New England Journal of Medicine*, *318*(21), 1349–1354. https://doi.org/10.1056/nejm198805263182102

Cristina C. Licciardello, Alan E. Harchik, & James K. Luiselli. (2008). Social Skills Intervention for Children with Autism During Interactive Play at a Public Elementary School. *Education and Treatment of Children*, *31*(1), 27–37. https://doi.org/10.1353/etc.0.0010

Ćurin, J. M., Terzić, J., Petković, Z. B., Zekan, L., Terzić, I. M., & Šušnjara, I. M. (2003). *Journal of Autism and Developmental Disorders*, *33*(4), 443–448. https://doi.org/10.1023/a:1025019030121

Damasio, A. R., & Maurer, R. G. (1978). A Neurological Model for Childhood Autism. *Archives of Neurology*, *35*(12), 777–786. https://doi.org/10.1001/archneur.1978.00500360001001

Dean, M., Harwood, R., & Kasari, C. (2017). The Art of camouflage: Gender Differences in the Social Behaviors of Girls and Boys with Autism Spectrum Disorder. *Autism*, *21*(6), 678–689. https://doi.org/10.1177/1362361316671845

de Boer, A., Pijl, S. J., & Minnaert, A. (2011). Regular primary schoolteachers' attitudes towards inclusive education: a review of the literature. *International Journal of Inclusive Education*, *15*(3), 331–353. https://doi.org/10.1080/13603110903030089

Deborah, F., Margaret, H., Edith, K., Dorothy, L., & Lynn, W. (1984). The question of left hemisphere dysfunction in infantile autism. *Psychological Bulletin*, *95*(2), 258–281. https://doi.org/10.1037/0033-2909.95.2.258

Del Valle, P. R., McEachern, A. G., & Chambers, H. D. (2001). Using social stories with autistic children. *Journal of Poetry Therapy*, *14*(4), 187-197.

DeMyer, M. K., Hingtgen, J. N., & Jackson, R. K. (1981). Infantile autism reviewed: A decade of research. *Schizophrenia bulletin*, *7*(3), 388-451.

Edelson, M. S. (2004). Auditory processing problems in Autism.

Erdem, R. (2017). Students with special educational needs and assistive technologies: A literature review. *Turkish Online Journal of Educational Technology-TOJET*, *16*(1), 128-146.

Eikeseth, S., Smith, T., Jahr, E., & Eldevik, S. (2002). Intensive Behavioral Treatment at School for 4- to 7-Year-Old Children with Autism. *Behavior Modification*, *26*(1), 49–68. https://doi.org/10.1177/0145445502026001004

Elksnin, L. K., & Elksnin, N. (1998). Teaching Social Skills to Students with Learning and Behavior Problems. *Intervention in School and Clinic*, *33*(3), 131–140. https://doi.org/10.1177/105345129803300301

Elliott, S. N., & Gresham, F. M. (2008). *Social skills improvement system: Intervention guide*. NCS Pearson.

Elliott, S. N., Sheridan, S. M., & Gresham, F. M. (1989). Assessing and treating social skills deficits: A case study for the scientist-practitioner. *Journal of School Psychology*, *27*(2), 197–222. https://doi.org/10.1016/0022-4405(89)90007-1

Press Release (2023, February 6). Primary education research (kindergarten and primary schools) end of the 2019/2020 school year. Elstat: https://www.statistics.gr/documents/20181/a25d2ffb-889e-3826-c022-1587ecd24b53

Erdem, R. (2017). Students with special educational needs and assistive technologies: A literature review. *Turkish Online Journal of Educational Technology-TOJET*, *16*(1), 128-146.

Ezzamel, N., & Bond, C. (2016). How have target pupil, peer and school level outcomes related to peer-mediated interventions for pupils with ASD been evaluated?. *European Journal of Special Needs Education*, *31*(4), 440-457. https://doi.org/10.1080/08856257.2016.1194568

Feld, S. L. (1982). Social Structural Determinants of Similarity among Associates. *American Sociological Review*, *47*(6), 797. https://doi.org/10.2307/2095216

Fenske, E. C., Zalenski, S., Krantz, P. J., & McClannahan, L. E. (1985). Age at intervention and treatment outcome for autistic children in a comprehensive intervention program. *Analysis and Intervention in Developmental Disabilities*, *5*(1-2), 49–58. https://doi.org/10.1016/s0270-4684(85)80005-7

Florian, L., & Black-Hawkins, K. (2011). Exploring inclusive pedagogy. *British Educational Research Journal*, *37*, 813-828.

Frith, U. (1989). *Autism: Explaining the Enigma*. Basil Blackwell.

Frith, U. (1994). Autism and theory of mind in everyday life. *Social Development*, *3*(2), 108–124. https://doi.org/10.1111/j.1467-9507.1994.tb00031.x

Frost, L. A., & Bondy, A. S. (1994). *PECS training manual*. Pyramid Educational Consultants.

Galanis, P., & Gena, A. (2018). Using self-management to promote the inclusion of preschoolers with autism spectrum disorder. *Journal of applied research in intellectual disabilities 31*(4), 519-519.

Ganz, J. B., Davis, J. L., Lund, E. M., Goodwyn, F. D., & Simpson, R. L. (2012). Meta-analysis of PECS with individuals with ASD: Investigation of targeted versus non-targeted outcomes, participant characteristics, and implementation phase. *Research in Developmental Disabilities*, *33*(2), 406–418. https://doi.org/10.1016/j.ridd.2011.09.023

Ganz, J. B., & Flores, M. M. (2008). Effects of the Use of Visual Strategies in Play Groups for Children with Autism Spectrum Disorders and their Peers. *Journal of Autism and Developmental Disorders*, *38*(5), 926–940. https://doi.org/10.1007/s10803-007-0463-4

Gash, H. (1993). A constructivist attempt to change attitudes towards children with special needs. *European Journal of Special Needs Education*, *8*(2), 106–125. https://doi.org/10.1080/0885625930080203

Gast, D. L., & Ledford, J. R. (2018). Replication. *Single case research methodology*, 77-95.

Gena, A. (2002). Autism and Pervasive Developmental Disorders: Assessment, Diagnosis, Management.

Gena, A. (2006). The effects of prompting and social reinforcement on establishing social interactions with peers during the inclusion of four children with autism in preschool. *International Journal of Psychology*, *41*(6), 541–554. https://doi.org/10.1080/00207590500492658

Gena, A., Papadopoulou, E., Loukrezi, S., & Galanis, P. (2007). The play of children with autism: Theory, assessment, and research on treatment. *Autism research advances*, 1-40.

Gena, A., Krantz, P. J., McClannahan, L. E., & Poulson, C. L. (1996). Training and generalization of affective behavior displayed by youth with autism. *Journal of applied behavior analysis*, *29*(3), 291-304.

Gena, A., & Kymissis, E. (2001). Assessing and setting goals for the attending and communicative behavior of three preschoolers with autism in inclusive kindergarten settings. *Journal of Developmental and Physical disabilities*, *13*(1), 11-26.

Gena, A., Couloura, S., & Kymissis, E. (2005). Modifying the Affective Behavior of Preschoolers with Autism Using In-Vivo or Video Modeling and Reinforcement Contingencies. *Journal of Autism and Developmental Disorders*, *35*(5), 545–556. https://doi.org/10.1007/s10803-005-0014-9

Gena, A., Galanis, P., Alai-Rosales, S., & Michalopoulou, E. (2014). Systemic behavior analytic applications for the treatment of children with ASD: Pilot results depicting naturalistic parent-child interaction. *Pluralism in Psychiatry: I. Diverse approaches and converging goals*, 77-82.

Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: social acceptance, friendships, and peer networks. *Journal of School Psychology*, *41*(4), 235–284. https://doi.org/10.1016/s0022-4405(03)00048-7

Gilboa, Y., & Helmer, A. (2020). Self-Management Intervention for Attention and Executive Functions Using Equine-Assisted Occupational Therapy Among Children Aged 6–14 Diagnosed with Attention Deficit/Hyperactivity Disorder. *The Journal of Alternative and Complementary Medicine*, *26*(3), 239–246. https://doi.org/10.1089/acm.2019.0374

Gilliam, J. E. (2006). *GARS: Gilliam autism rating scale*. TX: Pro-ed.

Grandin, T., & Scariano, M. (1995). Diagnosis: Autism. *A true story of an autistic person.* Greek Letters.

Green, G. (1996). Early behavioral intervention for autism: What does research tell us?.

Green, G. (1996). Early behavioral intervention for autism: What does research tell us? In C. Maurice, G. Green, & S. C. Luce (Eds.), *Behavioral intervention for young children with autism: A manual for parents and professionals* (pp. 29–44). PRO-ED.

Gutierrez Jr, A., Hale, M. N., Gossens-Archuleta, K., & Sobrino-Sánchez, V. (2007). Evaluating the Social Behavior of Preschool Children with Autism in an Inclusive Playground Setting. *International journal of special education*, *22*(3), 26-30.

Halvorsen, A. T., & Neary, T. (2009). *Building inclusive schools: Tools and strategies for success*. Pearson.

Handleman, J. S., Harris, S. L., & Martins, M. P. (2005). Helping children with autism enter the mainstream. In F. R. Volkmar, R. Paul, A. Klin & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders. Volume 2: Assessment, interventions and policy* (pp. 1029-1042). John Wiley & Sons.

Hargie, O., Saunders, C., & Dickson, D. (1994). *Social skills in interpersonal communication*. Psychology Press.

Harper, C. B., Symon, J. B. G., & Frea, W. D. (2007). Recess is Time-in: Using Peers to Improve Social Skills of Children with Autism. *Journal of Autism and Developmental Disorders*, *38*(5), 815–826. https://doi.org/10.1007/s10803-007-0449-2

Harris, S. L., & Handleman, J. S. (2000). Age and IQ at intake as predictors of placement for young children with autism: A four-to six-year follow-up. *Journal of autism and developmental disorders*, *30*(2), 137-142.

Harris, S. L., Handleman, J. S., & Jennett, H. K. (2005). Models of Educational Intervention for Students with Autism: Home, Center, and School-Based Programming. *Handbook of autism and pervasive developmental disorders*, *2*, 1043-1054.

Harris, J. (2018). Leo Kanner and autism: a 75-year perspective. *International Review of Psychiatry (Abingdon, England)*, *30*(1), 3–17. https://doi.org/10.1080/09540261.2018.1455646

Harrower, J. K., & Dunlap, G. (2001). Including Children with Autism in General Education Classrooms. *Behavior Modification*, *25*(5), 762–784. https://doi.org/10.1177/0145445501255006

Herrera, G., Alcantud, F., Jordan, R., Blanquer, A., Labajo, G., & De Pablo, C. (2008). Development of symbolic play through the use of virtual reality tools in children with autistic spectrum disorders. *Autism*, *12*(2), 143–157. https://doi.org/10.1177/1362361307086657

Barlow, D. H., Nock, M., & Hersen, M. (2009). *Single case experimental designs : strategies for studying behavior change*. Pearson.

Howlin, P. (1998). Children with autism and Asperger syndrome: A guide for practitioners and carers.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S. & Wolery, M. (2005) 'The use of single-subject research to identify evidence-based practice in special education.' Exceptional Children, 71 (2), pp. 165–79

Horner, D. H., & Baer, D. (1978). Multiple-probe technique: A variation of the multiple baseline. *Journal of Applied Behavior Analysis, 11*, 189–196.

Howard, J. S., Sparkman, C. R., Cohen, H. G., Center, V. M. R., Green, G., & Stanislaw, H. (2005). Published in: Research in Developmental Disabilities, 26, 359-383 (2005) A comparison of intensive behavior analytic and eclectic treatments for young children with autism. *Research in Developmental Disabilities*, *26*, 359-383.

Howlin, P. (1998). *Children with autism and Asperger syndrome: A guide for practitioners and carers*. John Wiley & Sons.

Howlin, P. (2000). Outcome in Adult Life for more Able Individuals with Autism or Asperger Syndrome. *Autism*, *4*(1), 63–83. https://doi.org/10.1177/1362361300004001005

Howlin, P. (2019). What Constitutes" Evidence-Based" Educational Practice?. *Journal of the American Academy of Child and Adolescent Psychiatry*, *59*(3), 344-345.

Jobe, L. E., & Williams White, S. (2007). Loneliness, social relationships, and a broader autism phenotype in college students. *Personality and Individual Differences*, *42*(8), 1479–1489. https://doi.org/10.1016/j.paid.2006.10.021

Johnston, J. M., & Pennypacker, H. S. (2010). *Strategies and Tactics of Behavioral Research*. Routledge.

Jung, S., Sainato, D. M., & Davis, C. A. (2008). Using High-Probability Request Sequences to Increase Social Interactions in Young Children With Autism. *Journal of Early Intervention*, *30*(3), 163–187. https://doi.org/10.1177/1053815108317970

Kakouros, E., & Maniadaki, K. (2003). *Child and adolescent psychopathology: A developmental approach*.

Kalat, J. (2001). *Biological Psychology*. HELLIN Publications.

Kalyva, E., & Agaliotis, I. (2009). Can contact affect Greek children's understanding of and attitudes towards peers with physical disabilities? *European Journal of Special Needs Education*, *24*(2), 213–220. https://doi.org/10.1080/08856250902793701

Kambouroglou, M., & Papantoniou, M. (2003). *Development and Communication and Speech Disorders in Autism*. Foundation for the child Pammakaristos.

Kamps, D. M., Leonard, B. R., Vernon, S., Dugan, E. P., Delquadri, J. C., Gershon, B., Wade, L., & Folk, L. (1992). Teaching social skills to students with autism to increase peer interactions in an integrated first-grade classroom. *Journal of Applied Behavior Analysis*, *25*(2), 281–288. https://doi.org/10.1901/jaba.1992.25-281

Kamps, D. M., Kravits, T., Lopez, A. G., Kemmerer, K., Potucek, J., & Harrell, L. G. (1998). What do the peers think? Social validity of peer-mediated programs. *Education and Treatment of Children*, 107-134.

Kamps, D., Royer, J., Dugan, E., Kravits, T., Gonzalez-Lopez, A., Garcia, J., Carnazzo, K., Morrison, L., & Kane, L. G. (2002). Peer Training to Facilitate Social Interaction for Elementary Students with Autism and Their Peers. *Exceptional Children*, *68*(2), 173–187. https://doi.org/10.1177/001440290206800202

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous child*, *2*(3), 217-250.

Kanner, L. (1944). Early infantile autism. *The Journal of Pediatrics*.

Katz, E., & Girolametto, L. (2015). Peer-mediated intervention for pre-schoolers with ASD: Effects on responses and initiations. *International Journal of Speech-Language Pathology*, *17*(6), 565–576. https://doi.org/10.3109/17549507.2015.1024166

Kazdin, A. E. (2018). Single-case experimental designs. Evaluating interventions in research and clinical practice. *Behaviour Research and Therapy*, *117*, 3-17. https://doi.org/10.1016/j.brat.2018.11.015

Kazdin, A. E. (2011). *Single-case research designs : methods for clinical and applied settings*. Oxford University Press.

Kazdin, A. E. (2005). *Social validity*. Encyclopedia of statistics in behavioral science.

Kennedy, C. H. (2005). *Single-case designs for educational research* (Vol. 1). Pearson/A & B.

Kent, C., Cordier, R., Joosten, A., Wilkes-Gillan, S., Bundy, A., & Speyer, R. (2019). A Systematic Review and Meta-analysis of Interventions to Improve Play Skills in Children with Autism Spectrum Disorder. *Review Journal of Autism and Developmental Disorders*, *7*, 91-118. https://doi.org/10.1007/s40489-019-00181-y

Koegel, R., Kim, S., Koegel, L., & Schwartzman, B. (2013). Improving socialization for high school students with ASD by using their preferred interests. *Journal of autism and developmental disorders*, *43*(9), 2121-2134.

Koegel, L. K., Vernon, T. W., Koegel, R. L., Koegel, B. L., & Paullin, A. W. (2012). Improving Social Engagement and Initiations Between Children With Autism Spectrum Disorder and Their Peers in Inclusive Settings. *Journal of Positive Behavior Interventions*, *14*(4), 220–227. https://doi.org/10.1177/1098300712437042

Koegel, L. K., Koegel, R. L., Fredeen, R. M., & Gengoux, G. W. (2008). Naturalistic behavioral approaches to treatment. In K. Chawarska, A. Klin, & F. R. Volkmar (Eds.), *Autism Spectrum Disorders in Infants and Toddlers: Diagnosis, Assessment, and Treatment* (pp. 207–242). Guilford Press.

Koegel, L. K., Koegel, R. L., Frea, W. D., & Fredeen, R. M. (2001). Identifying early intervention targets for children with autism in inclusive school settings. *Behavior modification*, *25*(5), 745-761. https://doi.org/10.1177/0145445501255005

Koegel, R. L., Koegel, L. K., & Carter, C. M. (1999). Pivotal teaching interactions for children with autism. *School Psychology Review*, *28*(4), 576-594. https://doi.org/10.1080/02796015.1999.12085986

Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis*, *25*(2), 341-353. https://doi.org/10.1901/jaba.1992.25-341

Kohler, F. W., Greteman, C., Raschke, D., & Highnam, C. (2007). Using a buddy skills package to increase the social interactions between a preschooler with autism and her peers. *Topics in Early Childhood Special Education*, *27*(3), 155-163. https://doi.org/10.1177/02711214070270030601

Krantz, P. J., & McClannahan, L. E. (1993). Teaching children with autism to initiate to peers: Effects of a script-fading procedure. *Journal of Applied Behavior Analysis*, *26*(1), 121-132. https://doi.org/10.1901/jaba.1993.26-121

Krantz, P. J., & McClannahan, L. E. (1998). Social interaction skills for children with autism: a script-fading procedure for beginning readers. *Journal of Applied Behavior Analysis*, *31*(2), 191–202. https://doi.org/10.1901/jaba.1998.31-191

Krasny, L., Williams, B. J., Provencal, S., & Ozonoff, S. (2003). Social skills interventions for the autism spectrum: essential ingredients and a model curriculum. *Child and Adolescent Psychiatric Clinics of North America*, *12*(1), 107–122. https://doi.org/10.1016/s1056-4993(02)00051-2

Kratochwill, T. R., Hitchcock, J. H., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2013). Single-case intervention research design standards. *Remedial and Special Education, 34(1),* 26-38.

Krier, J., & Lambros, K. M. (2020). Increasing joint attention and social play through peer-mediated intervention: A single case design. *Psychology in the Schools*, *58*(3), 494–514. https://doi.org/10.1002/pits.22460

Kypriotaki, M. A., & Markodimitraki, M. E. (2018). Playful Interactions between Twins with Autism and Teachers and Peers: a Case Study. *Preschool and Primary Education*, *6*(1), 1. https://doi.org/10.12681/ppej.11445

Kypriotakis, A. (2003). *Autistic children and their treatment*. *Papageorgiou.*

Lang, R., Kuriakose, S., Lyons, G., Mulloy, A., Boutot, A., Britt, C., ... & Lancioni, G. (2011). Use of school recess time in the education and treatment of children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, *5*(4), 1296-1305. https://doi.org/10.1016/j.rasd.2011.02.012

Laushey, K. M., & Heflin, L. J. (2000). Enhancing Social Skills of Kindergarten Children with Autism through the Training of Multiple Peers as Tutors. *Journal of Autism and Developmental Disorders*, *30*(3), 183–193. https://doi.org/10.1023/a:1005558101038

Lee, S., Odom, S. L., & Loftin, R. (2007). Social Engagement With Peers and Stereotypic Behavior of Children With Autism. *Journal of Positive Behavior Interventions*, *9*(2), 67–79. https://doi.org/10.1177/10983007070090020401

Lewkowicz, D. J., & Hansen-Tift, A. M. (2012). Infants deploy selective attention to the mouth of a talking face when learning speech. *Proceedings of the National Academy of Sciences*, *109*(5), 1431–1436. https://doi.org/10.1073/pnas.1114783109

Lindsay, G. (2007). Educational psychology and the effectiveness of inclusive education/mainstreaming. *British Journal of Educational Psychology*, *77*(1), 1–24. https://doi.org/10.1348/000709906x156881

Lindsay, S., Proulx, M., Scott, H., & Thomson, N. (2014). Exploring teachers' strategies for including children with autism spectrum disorder in mainstream classrooms. *International Journal of Inclusive Education*, *18*(2), 101–122. https://doi.org/10.1080/13603116.2012.758320

Lipsky, D. K., & Gartner, A. (1996). Inclusion, School Restructuring, and the Remaking of American Society. *Harvard Educational Review*, *66*(4), 762–797. https://doi.org/10.17763/haer.66.4.3686k7x734246430

Liss, M., Fein, D., Allen, D., Dunn, M., Feinstein, C., Morris, R., Waterhouse, L., & Rapin, I. (2001). Executive Functioning in High-functioning Children with Autism. *Journal of Child Psychology and Psychiatry*, *42*(2), 261–270. https://doi.org/10.1111/1469-7610.00717

Locke, J., Kasari, C., Rotheram-Fuller, E., Kretzmann, M., & Jacobs, J. (2012). Social Network Changes Over the School Year Among Elementary School-Aged Children with and Without an Autism Spectrum Disorder. *School Mental Health*, *5*(1), 38–47. https://doi.org/10.1007/s12310-012-9092-y

Loftin, R. L., Odom, S. L., & Lantz, J. F. (2007). Social Interaction and Repetitive Motor Behaviors. *Journal of Autism and Developmental Disorders*, *38*(6), 1124–1135. https://doi.org/10.1007/s10803-007-0499-5

Lord, C., Risi, S., Lambrecht, L., Cook, E. H., Leventhal, B. L., DiLavore, P. C., ... & Rutter, M. (2000). The Autism Diagnostic Observation Schedule—Generic: A standard measure of social and communication deficits associated with the spectrum of autism. *Journal of autism and developmental disorders*, *30*, 205-223.

Lord, C., & McGee, J. P. (2001). *Educating children with autism*. National Academic Press.

Lovaas, I., Newsom, C., & Hickman, C. (1987). Self-stimulatory behavior and perceptual reinforcement. *Journal of Applied Behavior Analysis*, *20*(1), 45–68. https://doi.org/10.1901/jaba.1987.20-45

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, *55*(1), 3–9. https://doi.org/10.1037/0022-006x.55.1.3

Lovaas, O. I. (2003). *Teaching individuals with developmental delays: Basic intervention techniques*. Pro-ed.

Loveland, K. A., & Tunali-Kotoski, B. (2005). The School-Age Child with an Autistic Spectrum Disorder. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders: Diagnosis, development, neurobiology, and behavior* (pp. 247–287). John Wiley & Sons, Inc..

Luiselli, J. K., Cannon, B. O., Ellis, J. T., & Sisson, R. W. (2000). Home-Based Behavioral Intervention for Young Children with Autism/Pervasive Developmental Disorder. *Autism*, *4*(4), 426–438. https://doi.org/10.1177/1362361300004004007

Lynch, S. L., & Irvine, A. N. (2009). Inclusive education and best practice for children with autism spectrum disorder: an integrated approach. *International Journal of Inclusive Education*, *13*(8), 845–859. https://doi.org/10.1080/13603110802475518

Lynch, S. A., & Simpson, C. G. (2010). Social skills: Laying the foundation for success. *Dimensions of Early Childhood*, *38*(2), 3-12.

MacDuff, G. S., Krantz, P. J., & McClannahan, L. E. (1993). Teaching children with autism to use photographic activity schedules: Maintenance and generalization of complex response chains. *Journal of applied Behavior analysis*, *26*(1), 89-97.

MacNeil, B. M., Lopes, V. A., & Minnes, P. M. (2009). Anxiety in children and adolescents with Autism Spectrum Disorders. *Research in Autism Spectrum Disorders*, *3*(1), 1–21. https://doi.org/10.1016/j.rasd.2008.06.001

Maggin, D. M., Chafouleas, S. M., Goddard, K. M., & Johnson, A. H. (2011). A systematic evaluation of token economies as a classroom management tool for students with challenging behavior. *Journal of School Psychology*, *49*(5), 529–554. https://doi.org/10.1016/j.jsp.2011.05.001

Maggin, D. M., Cook, B. G., & Cook, L. (2019). Making Sense of Single-Case Design Effect Sizes. *Learning Disabilities Research & Practice*, *34*(3), 124–132. https://doi.org/10.1111/ldrp.12204

Magiati, I., Dockrell, J. E., & Logotheti, A.-E. (2002). Young children's understanding of disabilities: the influence of development, context, and cognition. *Journal of Applied Developmental Psychology*, *23*(4), 409–430. https://doi.org/10.1016/s0193-3973(02)00126-0.

Mahoney, G. (2001). Book Review: Autism Spectrum Disorders: A Transactional Developmental Perspective. *Topics in Early Childhood Special Education*, *21*(3), 184–187. https://doi.org/10.1177/027112140102100307

Mallabar, S. (2019). *Stay, Play, and Talk: A Peer-Mediated Social Skills Program for Children with Autism Spectrum Disorder and Other Social Communication Difficulties (Phase IV)*. Brock University

Martinez, J. R., Waters, C. L., Conroy, M. A., & Reichow, B. (2019). Peer-Mediated Interventions to Address Social Competence Needs of Young Children With ASD: Systematic Review of Single-Case Research Design Studies. *Topics in Early Childhood Special Education*, *40*(4), 217-218. https://doi.org/10.1177/0271121419839136

Mason, R., Kamps, D., Turcotte, A., Cox, S., Feldmiller, S., & Miller, T. (2014). Peer mediation to increase communication and interaction at recess for students with autism

spectrum disorders. *Research in Autism Spectrum Disorders*, *8*(3), 334–344. https://doi.org/10.1016/j.rasd.2013.12.014

Mazefsky, C. A., & Oswald, D. P. (2006). The discriminative ability and diagnostic utility of the ADOS-G, ADI-R, and GARS for children in a clinical setting. *Autism*, *10*(6), 533-549.https://doi.org/10.1177/1362361306068505

McEvoy, M. A., Shores, R. E., Wehby, J. H., Johnson, S. M., & Fox, J. J. (1990). Special education teachers' implementation of procedures to promote social interaction among children in integrated settings. *Education and Training in Mental Retardation, 267-276.*

McClannahan, L. E., & Krantz, P. J. (1993). ON SYSTEMS ANALYSIS IN AUTISM INTERVENTION PROGRAMS. *Journal of Applied Behavior Analysis*, *26*(4), 589–596. https://doi.org/10.1901/jaba.1993.26-589

McClannahan, L. E., & Krantz, P. J. (1999). *Activity schedules for children with autism: Teaching independent behavior*. Woodbine House.

McClelland, M. M., Morrison, F. J., & Holmes, D. L. (2000). Children at risk for early academic problems: the role of learning-related social skills. *Early Childhood Research Quarterly*, *15*(3), 307–329. https://doi.org/10.1016/s0885-2006(00)00069-7

McCurdy, E. E., & Cole, C. L. (2013). Use of a Peer Support Intervention for Promoting Academic Engagement of Students with Autism in General Education Settings. *Journal of Autism and Developmental Disorders*, *44*(4), 883–893. https://doi.org/10.1007/s10803-013-1941-5

McGee, G. G., & Daly, T. (2007). Incidental Teaching of Age-Appropriate Social Phrases to Children with Autism. *Research and Practice for Persons with Severe Disabilities*, *32*(2), 112–123. https://doi.org/10.2511/rpsd.32.2.112

Merrell, K. W., & Gimpel, G. A. (1998). Social Skills of Children and Adolescents: Conceptualization. *Assessment, Treatment*.

Mesibov, G. B., Shea, V., & Schopler, E. (2005). *The TEACCH approach to autism spectrum disorders*. Springer Science & Business Media.

Michalopoulou, A., Muñoz González, J. M., & Hidalgo-Ariza, M. D. (2022). Effectiveness of PMI Combined with Common Interest Activity for Elementary School Students with Autism Spectrum Disorder. *Education Sciences*, *12*(10), 697. https://doi.org/10.3390/educsci12100697

Michelson, L., Sugai, D. P., Wood, R. P., & Kazdin, A. E. (1983). Social skills and child development. In *Social Skills Assessment and Training with Children* (pp. 1-11). Springer, Boston, MA.

Miltenberger, R. G. (1997). *Behavior modification: Principles and procedures*. Brooks/Cole.

Mitchem, K. J., Young, K. R., West, R. P., & Benyo, J. (2001). CWPASM: A classwide peer-assisted self-management program for general education classrooms. *Education and Treatment of Children*, 111-140.

Morrier, M. J., & Ziegler, S. M. T. (2018). I Wanna Play Too: Factors Related to Changes in Social Behavior for Children With and Without Autism Spectrum Disorder After Implementation of a Structured Outdoor Play Curriculum. *Journal of Autism and Developmental Disorders*, *48*(7), 2530–2541. https://doi.org/10.1007/s10803-018-3523-z

Morrison, L., Kamps, D., Garcia, J., & Parker, D. (2001). Peer Mediation and Monitoring Strategies to Improve Initiations and Social Skills for Students with Autism. *Journal of Positive Behavior Interventions*, *3*(4), 237–250. https://doi.org/10.1177/109830070100300405

Morton, J., & Frith, U. (1995). Causal modelling: a structural approach to developmental psychopathology in developmental psychopathology. *Theory and methods*, *1*, 375-390.

Myers, S. M., & Johnson, C. P. (2007). Management of Children With Autism Spectrum Disorders. *PEDIATRICS*, *120*(5), 1162–1182. https://doi.org/10.1542/peds.2007-2362

National Research Council. (2001). Educating children with autism. Committee on educational interventions for children with autism. In C. Lord, & J. P. McGee (Eds.),

Division of behavioral and social Sciences and education. Washington, DC: National Academy Press.

Newcomb, A. F., & Bagwell, C. L. (1995). Children's friendship relations: A meta-analytic review. *Psychological Bulletin*, *117*(2), 306–347. https://doi.org/10.1037/0033-2909.117.2.306

Nordgren, P. (2016). *From sounds to speech and gestures Case studies of linguistic interaction in children with ASC*. University of Gothenburg

Notas, S. (2006). *Parents and siblings of children with autism, pervasive developmental disorders*. Available in: http://www.autismhellas.gr

Odom, S. L., & Strain, P. S. (1986). A comparison of peer-initiation and teacher-antecedent interventions for promoting reciprocal social interaction of autistic preschoolers. *Journal of Applied Behavior Analysis*, *19*(1), 59–71. https://doi.org/10.1901/jaba.1986.19-59

Odom, S. L., Buysse, V., & Soukakou, E. (2011). Inclusion for Young Children With Disabilities. *Journal of Early Intervention*, *33*(4), 344–356. https://doi.org/10.1177/1053815111430094

Olley, J. G. (2005). Curriculum and classroom structure. *Handbook of autism and pervasive developmental disorders*, *2*, 863-881.

Owen-DeSchryver, J. S., Carr, E. G., Cale, S. I., & Blakeley-Smith, A. (2008). Promoting Social Interactions Between Students With Autism Spectrum Disorders and Their Peers in Inclusive School Settings. *Focus on Autism and Other Developmental Disabilities*, *23*(1), 15–28. https://doi.org/10.1177/1088357608314370

Parker, A. T., Grimmett, E. S., & Summers, S. (2008). Evidence-Based Communication Practices for Children with Visual Impairments and Additional Disabilities: An Examination of Single-Subject Design Studies. *Journal of Visual Impairment & Blindness*, *102*(9), 540–552. https://doi.org/10.1177/0145482x0810200904

Parker, R. I., Vannest, K. J., & Brown, L. (2009). The Improvement Rate Difference for Single-Case Research. *Exceptional Children*, *75*(2), 135–150. https://doi.org/10.1177/001440290907500201

Perovic, A., & Janke, V. (2013). Issues in the acquisition of binding and control in high-functioning children with autism. *UCL Working Papers in Linguistics*, *25*, 131-143.

Perovic, A., Modyanova, N., Hanson, E., Nelson, C., & Wexler, K. (2007). Investigations of language in autism: Evidence for a grammatical deficiency. *Autism Research in the UK (ARUK): From Diagnosis to Intervention.* The Open University, Milton Keynes.

Perovic, A., Modyanova, N., & Wexler, K. (2013). Comparison of Grammar in Neurodevelopmental Disorders: The Case of Binding in Williams Syndrome and Autism With and Without Language Impairment. *Language Acquisition*, *20*(2), 133–154. https://doi.org/10.1080/10489223.2013.766742

Petrina, N., Carter, M., Stephenson, J., & Sweller, N. (2016). Friendship Satisfaction in Children with Autism Spectrum Disorder and Nominated Friends. *Journal of Autism and Developmental Disorders*, *47*(2), 384–392. https://doi.org/10.1007/s10803-016-2970-7

Pierce, N. P., O'Reilly, M. F., Sorrells, A. M., Fragale, C. L., White, P. J., Aguilar, J. M., & Cole, H. A. (2014). Ethnicity reporting practices for empirical research in three autism-related journals. *Journal of Autism and Developmental Disorders*, *44*, 1507-1519. https://doi.org/10.1007/s10803-014-2041-x

Pierce, K., & Schreibman, L. (1995). Increasing complex social behaviors in children with autism: effects of peer-implemented pivotal response training. *Journal of Applied Behavior Analysis*, *28*(3), 285–295. https://doi.org/10.1901/jaba.1995.28-285

Phillips, W., Baron-Cohen, S., & Rutter, M. (1992). The role of eye contact in goal detection: Evidence from normal infants and children with autism or mental handicap. *Development and Psychopathology*, *4*(3), 375–383. https://doi.org/10.1017/s0954579400000845

Prizant, B. M., & Rydell, P. J. (1984). Analysis of Functions of Delayed Echolalia in Autistic Children. *Journal of Speech, Language, and Hearing Research*, *27*(2), 183–192. https://doi.org/10.1044/jshr.2702.183

Quill, K. A. (Ed.). (1995). *Teaching children with autism: Strategies to enhance communication and socialization*. Cengage Learning.

Ramos, F. dos S., De Bittencourt, D. D., Camargo, S. P. H., & Schmidt, C. (2018). Intervenção mediada por pares: Conceito e implicações para a pesquisa e para as práticas pedagógicas de professores de alunos com autismo. *Education Policy Analysis Archives*, *26*, 23-33. https://doi.org/10.14507/epaa.26.3367

Rao, P. A., Beidel, D. C., & Murray, M. J. (2007). Social Skills Interventions for Children with Asperger's Syndrome or High-Functioning Autism: A Review and Recommendations. *Journal of Autism and Developmental Disorders*, *38*(2), 353–361. https://doi.org/10.1007/s10803-007-0402-4

Reichow, B., Servili, C., Yasamy, M. T., Barbui, C., & Saxena, S. (2013). Non-specialist psychosocial interventions for children and adolescents with intellectual disability or lower-functioning autism spectrum disorders: a systematic review. *PLoS medicine*, *10*(12), e1001572. https://doi.org/10.1371/journal.pmed.1001572

Reichow, B., Volkmar, F. R., & Cicchetti, D. V. (2008). Development of the evaluative method for evaluating and determining evidence-based practices in autism. *Journal of autism and developmental disorders*, *38*(7), 1311-1319. https://doi.org/10.1007/s10803-007-0517-7

Reichow, B., & Volkmar, F. (2010). PROTOCOL: Social skills group interventions for autism spectrum disorders in individuals aged 6 to 21 years. *Campbell Systematic Reviews*, *6*(1), 1–21. https://doi.org/10.1002/cl2.69

Reid, R. (1996). Research in Self-Monitoring with Students with Learning Disabilities: The Present, the Prospects, the Pitfalls. *Journal of Learning Disabilities*, *29*(3), 317–331. https://doi.org/10.1177/002221949602900311

Repp, A. C., Deitz, D. E., Boles, S. M., Deitz, S. M., & Repp, C. F. (1976). *Differences among common methods for calculating interobserver agreement*. *Journal of Applied Behavior Analysis*, *9*(1), 109.

Riggio, R. E. (1986). Assessment of basic social skills. *Journal of Personality and Social Psychology*, *51*(3), 649–660. https://doi.org/10.1037/0022-3514.51.3.649

Roberts, J., & Simpson, K. (2016). A Review of Research into Stakeholder Perspectives on Inclusion of Students with Autism in Mainstream Schools. *International Journal of Inclusive Education*, *20*(10), 1084–1096. https://doi.org/10.1080/13603116.2016.1145267

Roberts, J., & Webster, A. (2020). Including students with autism in schools: a whole school approach to improve outcomes for students with autism. *International Journal of Inclusive Education*, *26*(7), 1–18. https://doi.org/10.1080/13603116.2020.1712622

Rodríguez-Medina, J., Rodríguez-Navarro, H., Arias, V., Arias, B., & Anguera, M. T. (2018). Non-reciprocal Friendships in a School-Age Boy with Autism: The Ties that Build? *Journal of Autism and Developmental Disorders*, *48*(9), 2980–2994. https://doi.org/10.1007/s10803-018-3575-0

Rodríguez-Medina, J., Martín-Antón, L. J., Carbonero, M. A., & Ovejero, A. (2016). Peer-mediated intervention for the development of social interaction skills in high-functioning autism spectrum disorder: A pilot study. *Frontiers in Psychology*, *7*, 1986. https://doi.org/10.3389/fpsyg.2016.01986

Rogers, S. J. (2000). Interventions That Facilitate Socialization in Children with Autism. *Journal of Autism and Developmental Disorders*, *30*(5), 399–409. https://doi.org/10.1023/a:1005543321840

Rousseau, M. K., Krantz, P. J., Poulson, C. L., Kitson, M. E., & McClannahan, L. E. (1994). Sentence combining as a technique for increasing adjective use in writing by students with autism. *Research in developmental disabilities*, *15*(1), 19-37.

Rosenthal, M., Wallace, G. L., Lawson, R., Wills, M. C., Dixon, E., Yerys, B. E., & Kenworthy, L. (2013). Impairments in real-world executive function increase from childhood to adolescence in autism spectrum disorders. *Neuropsychology*, *27*(1), 13–18. https://doi.org/10.1037/a0031299

Rotheram-Fuller, E. J. (2005). *Age-related changes in the social inclusion of children with autism in general education classrooms*. University of California.

Rotheram-Fuller, E. J. (2005). *Age-related changes in the social inclusion of children with autism in general education classrooms*. University of California.

Rowley, E., Chandler, S., Baird, G., Simonoff, E., Pickles, A., Loucas, T., & Charman, T. (2012). The experience of friendship, victimization and bullying in children with an autism spectrum disorder: Associations with child characteristics and school placement. *Research in Autism Spectrum Disorders*, *6*(3), 1126-1134.

Rozelle, R. M., Druckman, D., & Baxter, J. C. (1997). Non-verbal behavior as communication. *The handbook of communication skills*, 67-102.

Rutter, M. (1990). *Childhood autism*. Greek letters.

Sainato, D. M., Strain, P. S., Lefebvre, D., & Rapp, N. (1987). Facilitating transition times with handicapped preschool children: A comparison between peermediated and antecedent prompt procedures. *Journal of Applied Behavior Analysis, 20,* 285-291. https://doi.org/10.1901/jaba.1987.20-285

Sallows, G. O., & Graupner, T. D. (2005). Intensive Behavioral Treatment for Children With Autism: Four-Year Outcome and Predictors. *American Journal on Mental Retardation, 110*(6), 417-427 https://doi.org/10.1352/0895-8017(2005)110[417:ibtfcw]2.0.co;2

Schall, C. M., & McDonough, J. T. (2010). Autism spectrum disorders in adolescence and early adulthood: Characteristics and issues. *Journal of Vocational Rehabilitation*, *32*(2), 81–88. https://doi.org/10.3233/jvr-2010-0503

Scheuermann, B., & Webber, J. (2002). *Autism: Teaching does make a difference*. Wadsworth Publishing Company.

Schlosser, R. W., Lee, D. L., & Wendt, O. (2008). Application of the percentage of non-overlapping data (PND) in systematic reviews and meta-analyses: A systematic review of reporting characteristics. *Evidence-Based Communication Assessment and Intervention, 2*(3), 163–187. https://doi.org/10.1080/17489530802505412

Schmidt, C., & Stichter, J. P. (2012). The Use of Peer-Mediated Interventions to Promote the Generalization of Social Competence for Adolescents with High-Functioning Autism and Asperger's Syndrome. *Exceptionality*, *20*(2), 94–113. https://doi.org/10.1080/09362835.2012.669303

Schreibman, L. Schreibman, L., & Ingersoll, B.(2005). Behavioral interventions to promote learning in individuals with autism. In F. Volkmar, R. Paul, A. Klin, R. and D. Cohen (Eds.). *Handbook of autism and pervasive developmental disorders* (pp. 882-896). John Wiley & Sons, Inc.

Schreibman, L., & Winter, J. (2003). EP on Autism: Behavioral Intervention Therapies. *Exceptional Parent*, *33*(11), 64-71.

Scruggs, T. E., & Mastropieri, M. A. (1998). Summarizing Single-Subject Research. *Behavior Modification*, *22*(3), 221–242. https://doi.org/10.1177/01454455980223001

Scruggs, T. E., Mastropieri, M. A., & Casto, G. (1987). The Quantitative Synthesis of Single-Subject Research. *Remedial and Special Education*, *8*(2), 24–33. https://doi.org/10.1177/074193258700800206

Shaddock, T. (2006, September). Students with disability in the mainstream: What works for teachers and students. In *Cheri Conference, Westmead, NSW*.

Shapiro, T. (1977). The Quest for a Linguistic Model to Study the Speech of Autistic Children: Studies on Echoing. *Journal of the American Academy of Child Psychiatry*, *16*(4), 608–619. https://doi.org/10.1016/s0002-7138(09)61182-1

Sheinkopf, S. J., & Siegel, B. (1998). Home-based behavioral treatment of young children with autism. *Journal of autism and developmental disorders*, *28*(1), 15-23.

Sigman, M., & Ruskin, E. (1999). Continuity and change in the social competence of children with autism, down syndrome and developmental delays. *Monographs of the Society for Research in Children Development*, *64*, 105-114. https://doi.org/10.1111/1540-5834.00001

Simpson, R. L., de Boer-Ott, S. R., & Smith-Myles, B. (2003). Inclusion of Learners with Autism Spectrum Disorders in General Education Settings. *Topics in Language Disorders*, *23*(2), 116–133. https://doi.org/10.1097/00011363-200304000-00005

Simpson, L. A., & Bui, Y. (2016). Effects of a peer-mediated intervention on social interactions of students with low-functioning autism and perceptions of typical peers. *Education and Training in Autism and Developmental Disabilities*, 162-178.

SINGH, J. P., & HART, S. A. (2003). Development as cross-cultural communication. *Journal of International Communication*, *9*(2), 50–75. https://doi.org/10.1080/13216597.2003.9751954

Sivaraman, M., & Fahmie, T. A. (2018). Using common interests to increase socialization between children with autism and their peers. *Research in Autism Spectrum Disorders*, *51*, 1–8. https://doi.org/10.1016/j.rasd.2018.03.007

Smith, T., Buch, G. A., & Gamby, T. E. (2000). Parent-directed, intensive early intervention for children with pervasive developmental disorder. *Research in developmental disabilities*, *21*(4), 297-309.

Smith, T., Groen, A. D., & Wynn, J. W. (2000). Randomized Trial of Intensive Early Intervention for Children With Pervasive Developmental Disorder. *American Journal on Mental Retardation*, *105*(4), 269. https://doi.org/2.0.co;2">10.1352/0895-8017(2000)105<0269:rtoiei>2.0.co;2

Soulis, S.-G., Georgiou, A., Dimoula, K., & Rapti, D. (2016). Surveying inclusion in Greece: empirical research in 2683 primary school students. *International Journal of Inclusive Education*, *20*(7), 770–783. https://doi.org/10.1080/13603116.2015.1111447

Sperry, L., Neitzel, J., & Engelhardt-Wells, K. (2010). Peer-Mediated Instruction and Intervention Strategies for Students with Autism Spectrum Disorders. *Preventing School Failure: Alternative Education for Children and Youth*, *54*(4), 256–264. https://doi.org/10.1080/10459881003800529

Stasinos, D. (2013). The special education 2020. For an inclusive or total education in the new-digital school with digital champions. *PAPAZISI publications.*

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization1. *Journal of Applied Behavior Analysis*, *10*(2), 349–367. https://doi.org/10.1901/jaba.1977.10-349

Sulzer-Azaroff, B., & Mayer, G. R. (1991). *Behavior analysis for lasting change*. Holt, Rinehart & Winston.

Tanious, R., & Onghena, P. (2019). Randomized Single-Case Experimental Designs in Healthcare Research: What, Why, and How? *Healthcare*, *7*(4), 143. https://doi.org/10.3390/healthcare7040143

Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research. How to Choose a Sampling Technique for Research *SSRN Electronic Journal 5(2)*,18-27

Taylor, B. A., Levin, L., & Jasper, S. (1999). Increasing play-related statements in children with autism toward their siblings: Effects of video modeling. *Journal of developmental and Physical disabilities*, *11*(3), 253-264. https://doi.org/10.1023/a:1021800716392

Terzi, A., Marinis, T., Kotsopoulou, A., & Francis, K. (2014). Grammatical Abilities of Greek-Speaking Children with Autism. *Language Acquisition*, *21*(1), 4–44. https://doi.org/10.1080/10489223.2013.855216

Trottier, N., Kamp, L., & Mirenda, P. A. T. (2011). Effects of peer-mediated instruction to teach use of speech-generating devices to students with autism in social game routines. *Augmentative and Alternative Communication*, *27*(1), 26-39. https://doi.org/10.3109/07434618.2010.546810

Tsamitrou, E., & Agaliotis, I. (2010). Intervention program to enhance interaction between children with autism and their typically developing siblings-a case study. [Master's thesis]. http://dspace.lib.uom.gr/handle/2159/13989

Vakirtzi, E. (2014). *The Egg*, 1st ed.; Patakis Publications: Athens, Greece.

Van Der Steen, S., Geveke, C. H., Steenbakkers, A. T., & Steenbeek, H. W. (2020). Teaching students with Autism Spectrum Disorders: What are the needs of educational professionals? *Teaching and Teacher Education*, *90*, 103036. https://doi.org/10.1016/j.tate.2020.103036

van der Worp-van der Kamp, L., Pijl, S. J., Bijstra, J. O., & van den Bosch, E. J. (2013). Teaching academic skills as an answer to behavioural problems of students with emotional or behavioural disorders: a review. *European Journal of Special Needs Education*, *29*(1), 29–46. https://doi.org/10.1080/08856257.2013.830444

van Roekel, E., Scholte, R. H. J., & Didden, R. (2009). Bullying Among Adolescents With Autism Spectrum Disorders: Prevalence and Perception. *Journal of Autism and Developmental Disorders*, *40*(1), 63–73. https://doi.org/10.1007/s10803-009-0832-2

Vogindroukas, I. (2005). Pragmatic skills in children with autism. *ELPSE, 12 (2), 276-292.*

Wang, L., Peng, J. L., Qiao, F. Q., Cheng, W. M., Lin, G. W., Zhang, Y., ... & Wang, P. (2021). Clinical randomized controlled study of acupuncture treatment on children with autism spectrum disorder (ASD): A Systematic Review and Meta-Analysis. *Evidence-Based Complementary and Alternative Medicine*, *2021*.

Wang, P., & Spillane, A. (2009). Evidence-based social skills interventions for children with autism: A meta-analysis. *Education and Training in Developmental Disabilities*, *44*(3), 318-342.

Watkins, L., O'Reilly, M., Kuhn, M., & Ledbetter-Cho, K. (2019). An interest-based intervention package to increase peer social interaction in young children with autism spectrum disorder. *Journal of Applied Behavior Analysis*, *52*(1), 132-149. https://doi.org/10.1002/jaba.514

Watkins, L., O'Reilly, M., Kuhn, M., Gevarter, C., Lancioni, G. E., Sigafoos, J., & Lang, R. (2015). A Review of Peer-Mediated Social Interaction Interventions for Students with Autism in Inclusive Settings. *Journal of Autism and Developmental Disorders*, *45*(4), 1070–1083. https://doi.org/10.1007/s10803-014-2264-x

Watson, P. J., & Workman, E. A. (1981). The non-concurrent multiple baseline across-individuals design: An extension of the traditional multiple baseline design. *Journal of Behavior Therapy and Experimental Psychiatry*, *12*(3), 257–259. https://doi.org/10.1016/0005-7916(81)90055-0

Webster, A. (2016). Utilising a Leadership Blueprint to Build the Capacity of Schools to Achieve Outcomes for Students with Autism Spectrum Disorder. In *Leadership in Diverse Learning Contexts* (pp. 109-127). Springer.

Webster, A., & Roberts, J. (2020). Implementing the school-wide autism competency model to improve outcomes for students on the autism spectrum: a multiple case study of three schools. *International Journal of Inclusive Education*, *26*(8) 1–19. https://doi.org/10.1080/13603116.2020.1735540

Weiss, M. J., & Harris, S. L. (2001). Teaching Social Skills to People with Autism. *Behavior Modification*, *25*(5), 785–802. https://doi.org/10.1177/0145445501255007

Weiss, M. J. (1999). Differential rates of skill acquisition and outcomes of early intensive behavioral intervention for autism. *Behavioral Interventions*, *14*(1), 3–22. https://doi.org/3.0.co;2-f">10.1002/(sici)1099-078x(199901/03)14:1<3::aid-bin25>3.0.co;2-f

Westling, D. L. (2009). Teachers and Challenging Behavior. *Remedial and Special Education*, *31*(1), 48–63. https://doi.org/10.1177/0741932508327466

Wilkinson, C., & Murphy, E. (2016). Joint interventions in autism spectrum disorder: relating oscillopathies and syntactic deficits. *UCL Work. Pap. Linguist*, *28*, 1-7.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders*, *9*(1), 11–29. https://doi.org/10.1007/bf01531288

Wing, L. (1991). The relationship between Asperger's syndrome and Kanner's autism. In U. Frith (Ed.), *Autism and Asperger syndrome* (pp. 93–121). Cambridge University Press. https://doi.org/10.1017/CBO9780511526770.003

Wing, L. (1993). *Autism spectrum disorders, a guide to diagnosis. The disabilities of autistic children an assistant for the diagnosis.* Hellenic Society for the Protection of Autistic People.

Wing, L. (2000). The Autism Spectrum – A Guide for Parents and Professionals. *EEPAA.*

Wittke, K., Mastergeorge, A. M., Ozonoff, S., Rogers, S. J., & Naigles, L. R. (2017). Grammatical Language Impairment in Autism Spectrum Disorder: Exploring Language Phenotypes Beyond Standardized Testing. *Frontiers in Psychology*, *8*. 1-12. https://doi.org/10.3389/fpsyg.2017.00532

Whalon, K. J., Conroy, M. A., Martinez, J. R., & Werch, B. L. (2015). School-based peer-related social competence interventions for children with autism spectrum

disorder: A meta-analysis and descriptive review of single case research design studies. *Journal of autism and developmental disorders*, *45*, 1513-1531.

White, S. W., Oswald, D., Ollendick, T., & Scahill, L. (2009). Anxiety in children and adolescents with autism spectrum disorders. *Clinical Psychology Review*, *29*(3), 216–229. https://doi.org/10.1016/j.cpr.2009.01.003

World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*. World Health Organization.

World Health Organization. (1997). *Application of the International Classification of Diseases to Neurology: ICD-NA*. World Health Organization.

Zagona, A. L., & Mastergeorge, A. M. (2018). An empirical review of peer-mediated interventions: Implications for young children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *33*(3), 131-141. https://doi.org/10.1177/1088357616671295

Zhang, J., & Wheeler, J. J. (2011). A meta-analysis of peer-mediated interventions for young children with autism spectrum disorders. *Education and Training in Autism and Developmental Disabilities*, *46*(1) 62-77.

Zoniou-Sideri, A., & Vlachou, A. (2006). Greek teachers' belief systems about disability and inclusive education. *International Journal of Inclusive Education*, *10*(4-5), 379–394. https://doi.org/10.1080/13603110500430690

APPENDIX

Appendix 1:

Special form of initiations and responses that were recorded

Name of ASD student:	Date:
Name of researcher:	Meeting number:
Activity:	

INITIATIONS	
Questions	
Emotional behaviors	
Participation in activities	
Attempts to attract attention / interest	
Invites	
Other	

RESPONSES									
1	2	3	4	5	6	7	8	9	10

Comments:

.....

.....

.....

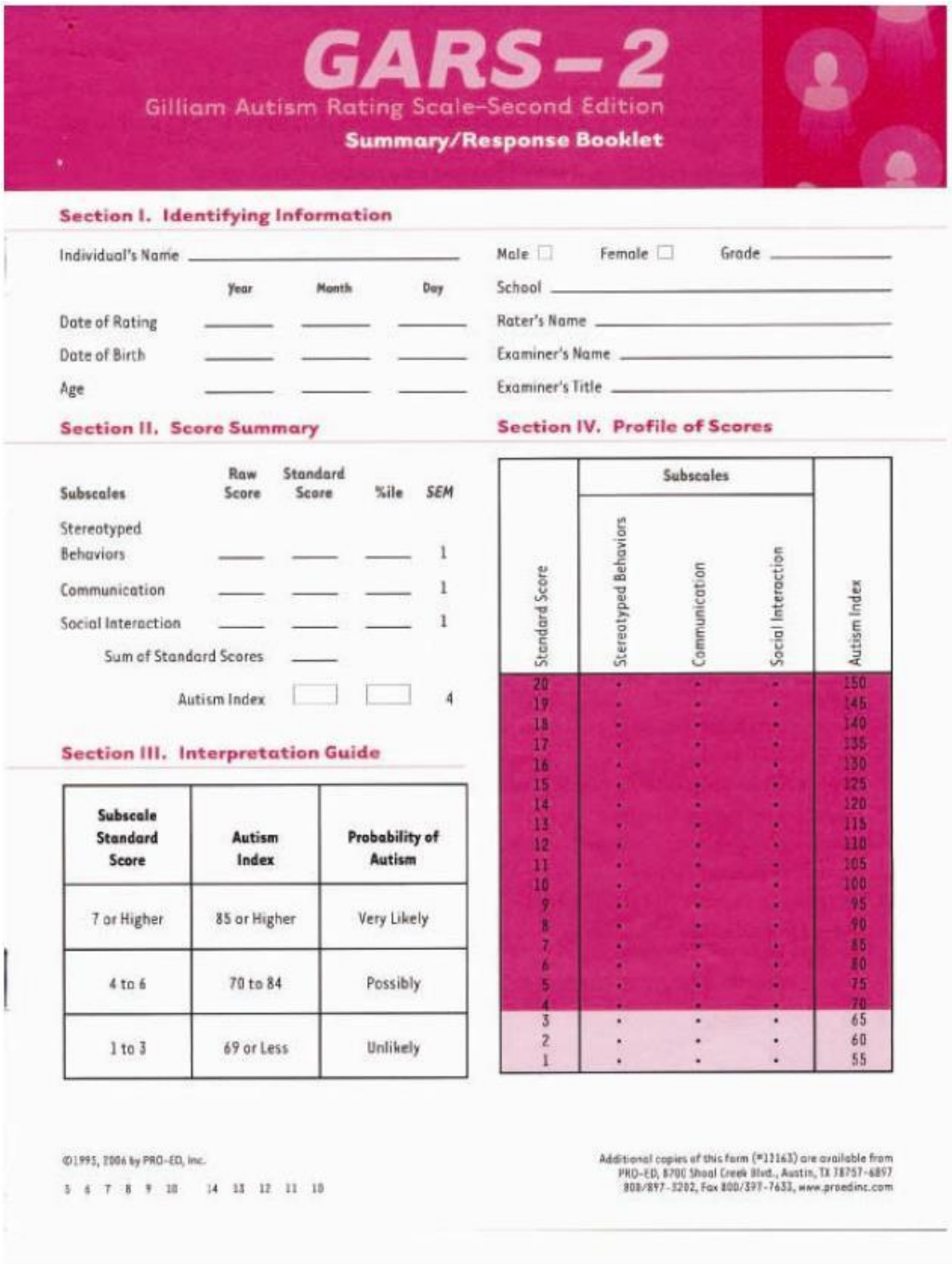
.....

Initiations: number of initiations during a school break

Responses: number of positive responses divided by the number of total attempts from peers during a school break. In every successful attempt we fill a tick and in every failed one we fill an X.

Appendix 2:

Gars-2 Scale Score



GARS-2

Gilliam Autism Rating Scale-Second Edition

Summary/Response Booklet

Section I. Identifying Information

Individual's Name _____ Male ☐ Female ☐ Grade _____

	Year	Month	Day
Date of Rating			
Date of Birth			
Age			

School _____

Rater's Name _____

Examiner's Name _____

Examiner's Title _____

Section II. Score Summary

Subscales	Raw Score	Standard Score	%ile	*SEM*
Stereotyped Behaviors				1
Communication				1
Social Interaction				1
Sum of Standard Scores				
Autism Index				4

Section III. Interpretation Guide

Subscale Standard Score	Autism Index	Probability of Autism
7 or Higher	85 or Higher	Very Likely
4 to 6	70 to 84	Possibly
1 to 3	69 or Less	Unlikely

Section IV. Profile of Scores

Standard Score	Subscales: Stereotyped Behaviors	Subscales: Communication	Subscales: Social Interaction	Autism Index
20	•	•	•	150
19	•	•	•	145
18	•	•	•	140
17	•	•	•	135
16	•	•	•	130
15	•	•	•	125
14	•	•	•	120
13	•	•	•	115
12	•	•	•	110
11	•	•	•	105
10	•	•	•	100
9	•	•	•	95
8	•	•	•	90
7	•	•	•	85
6	•	•	•	80
5	•	•	•	75
4	•	•	•	70
3	•	•	•	65
2	•	•	•	60
1	•	•	•	55

5 6 7 8 9 10 14 13 12 11 10

Additional copies of this form (#11163) are available from PRO-ED, 8700 Shoal Creek Blvd., Austin, TX 78757-6897 800/897-3202, Fax 800/397-7633, www.proedinc.com

Appendix 3:

Gars-2 Communication Scale

Section V. *Continued.*

Subscale 2: Communication

Directions: Rate the following items according to the frequency of occurrence. Use the following guidelines for your ratings:

0 Never Observed—You have never seen the individual behave in this manner.
1 Seldom Observed—Individual behaves in this manner 1–2 times per 6-hour period.
2 Sometimes Observed—Individual behaves in this manner 3–4 times per 6-hour period.
3 Frequently Observed—Individual behaves in this manner at least 5–6 times per 6-hour period.

Circle the number that best describes your observations of the individual's typical behavior under ordinary circumstances (i.e., in most places, with familiar people, and in usual daily activities). Remember to rate every item. If you are uncertain about how to rate an item, delay the rating and observe the individual for a 6-hour period to determine your rating. REMEMBER, EVERY ITEM SHOULD RECEIVE A SCORE.

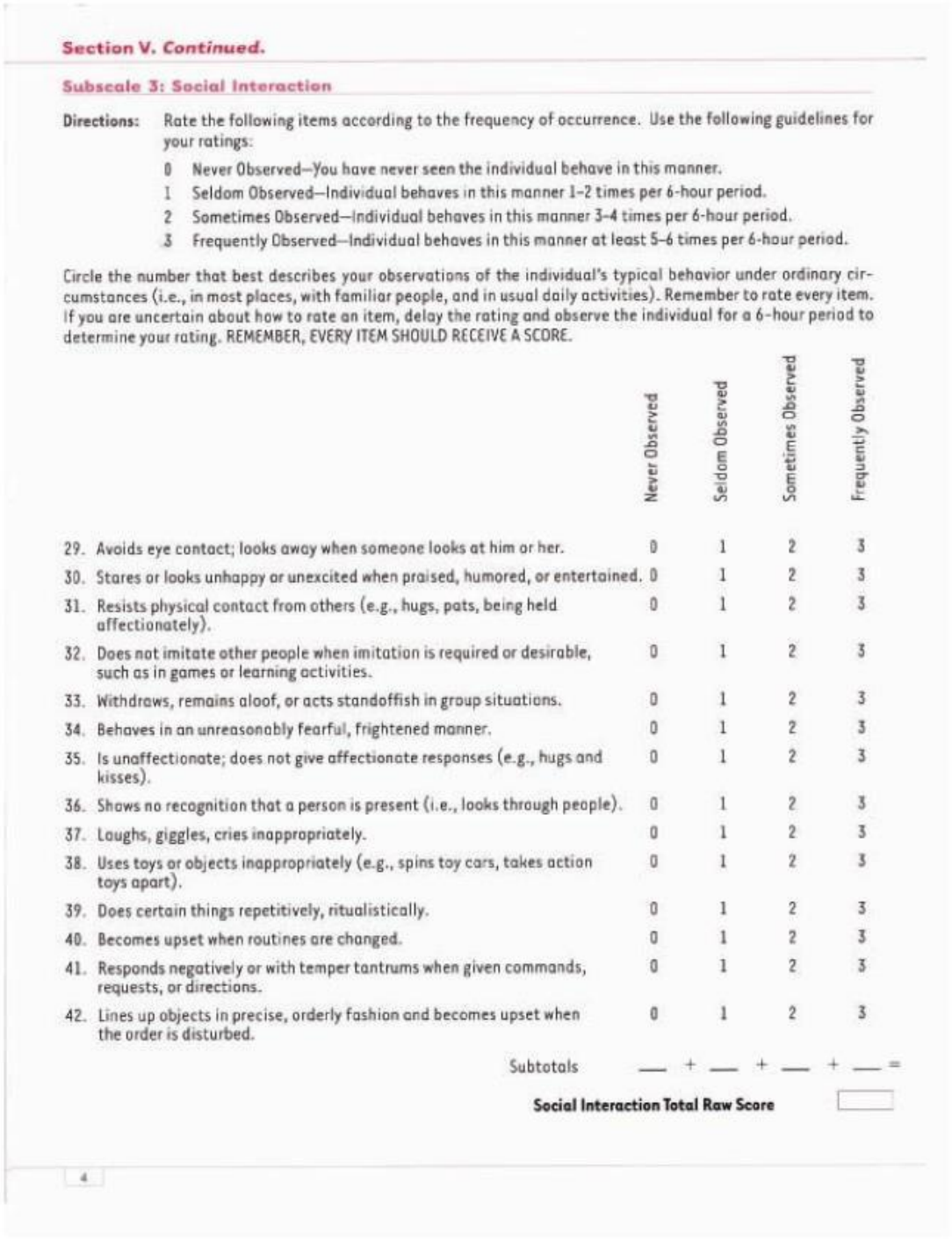
How does this individual communicate? Talks ___ Signs ___ Does not Talk or Sign ___
If the individual does not talk, sign, or use any other form of communication, omit this subscale.

	Never Observed	Seldom Observed	Sometimes Observed	Frequently Observed
15. Repeats (echoes) words verbally or with signs.	0	1	2	3
16. Repeats words out of context (i.e., repeats words heard at an earlier time; e.g., repeats words heard more than 1 minute earlier).	0	1	2	3
17. Repeats words or phrases over and over.	0	1	2	3
18. Speaks or signs with flat tone, affect, or dysrhythmic patterns.	0	1	2	3
19. Responds inappropriately to simple commands (e.g., "sit down," "stand up").	0	1	2	3
20. Looks away or avoids looking at speaker when name is called.	0	1	2	3
21. Does not ask for things he or she wants.	0	1	2	3
22. Does not initiate conversations with peers or adults.	0	1	2	3
23. Uses "yes" and "no" inappropriately. Says "yes" when asked if he or she wants an aversive stimulus, or says "no" when asked if he or she wants a favorite toy or treat.	0	1	2	3
24. Uses pronouns inappropriately (e.g., refers to self as "he," "you," "she").	0	1	2	3
25. Uses the word *I* inappropriately (e.g., does not say "I" to refer to self).	0	1	2	3
26. Repeats unintelligible sounds (babbles) over and over.	0	1	2	3
27. Uses gestures instead of speech or signs to obtain objects.	0	1	2	3
28. Inappropriately answers questions about a statement or brief story.	0	1	2	3
Subtotals	___	+ ___	+ ___	+ ___ =

Communication Total Raw Score ☐

Appendix 4:

Gars-2 Social Interaction Scale



Section V. *Continued.*

Subscale 3: Social Interaction

Directions: Rate the following items according to the frequency of occurrence. Use the following guidelines for your ratings:

0 Never Observed—You have never seen the individual behave in this manner.
1 Seldom Observed—Individual behaves in this manner 1–2 times per 6-hour period.
2 Sometimes Observed—Individual behaves in this manner 3–4 times per 6-hour period.
3 Frequently Observed—Individual behaves in this manner at least 5–6 times per 6-hour period.

Circle the number that best describes your observations of the individual's typical behavior under ordinary circumstances (i.e., in most places, with familiar people, and in usual daily activities). Remember to rate every item. If you are uncertain about how to rate an item, delay the rating and observe the individual for a 6-hour period to determine your rating. REMEMBER, EVERY ITEM SHOULD RECEIVE A SCORE.

	Never Observed	Seldom Observed	Sometimes Observed	Frequently Observed
29. Avoids eye contact; looks away when someone looks at him or her.	0	1	2	3
30. Stares or looks unhappy or unexcited when praised, humored, or entertained.	0	1	2	3
31. Resists physical contact from others (e.g., hugs, pats, being held affectionately).	0	1	2	3
32. Does not imitate other people when imitation is required or desirable, such as in games or learning activities.	0	1	2	3
33. Withdraws, remains aloof, or acts standoffish in group situations.	0	1	2	3
34. Behaves in an unreasonably fearful, frightened manner.	0	1	2	3
35. Is unaffectionate; does not give affectionate responses (e.g., hugs and kisses).	0	1	2	3
36. Shows no recognition that a person is present (i.e., looks through people).	0	1	2	3
37. Laughs, giggles, cries inappropriately.	0	1	2	3
38. Uses toys or objects inappropriately (e.g., spins toy cars, takes action toys apart).	0	1	2	3
39. Does certain things repetitively, ritualistically.	0	1	2	3
40. Becomes upset when routines are changed.	0	1	2	3
41. Responds negatively or with temper tantrums when given commands, requests, or directions.	0	1	2	3
42. Lines up objects in precise, orderly fashion and becomes upset when the order is disturbed.	0	1	2	3
Subtotals	___	+ ___	+ ___	+ ___ =

Social Interaction Total Raw Score ___

4

Appendix 5:

Gars-2 Converting Raw Score

Table A.1
Converting Raw Scores to Standard Scores and Percentiles

Standard Score	Subscales			%ile
	Stereotyped Behaviors	Communication	Social Interaction	
1	–	–	–	<1
2	–	–	1–2	<1
3	1–2	1–2	3–5	1
4	3–5	3–5	6–8	2
5	6–8	6–7	9–10	3
6	9–10	8–10	11–13	9
7	11–13	11–12	14–16	16
8	14–16	13–15	17–18	25
9	17–18	16–18	19–21	37
10	19–21	19–20	22–24	50
11	22–24	21–23	25–26	63
12	25–26	24–25	27–29	75
13	27–29	26–28	30–32	84
14	30–32	29–31	33–34	91
15	33–34	32–33	35–37	95
16	35–37	34–36	38–40	98
17	38–40	37–38	41–42	99
18	41–42	39–41	–	>99
19	–	42	–	>99
20	–	–	–	>99

Appendix 6:

Gars-2 Converting Raw Scoreof Sums

Table A.2 *Continued.*
Converting Sums of Standard Scores to Autism Index and Percentiles

Autism Index	Sum of 3 Subscales	Sum of 2 Subscales	%ile
131	—	—	99
130	44	30	98
129	—	—	98
128	43	—	98
127	—	29	97
126	42	—	96
125	—	—	95
124	41	28	95
123	—	—	94
122	40	—	93
121	—	27	92
120	—	—	91
119	39	—	90
118	—	26	89
117	38	—	87
116	—	—	86
115	37	25	84
114	—	—	82
113	36	—	81
112	—	24	79
111	35	—	77
110	—	—	75
109	34	23	73
108	—	—	70
107	—	—	68
106	33	22	65
105	—	—	63
104	32	—	61
103	—	21	58
102	31	—	55
101	—	—	53
100	30	20	50
99	—	—	47
98	29	—	45

(continues)

Appendix 7.

Measurement of Initiations and Responses for Nikos

	BASELINE PHASE				INTERVENTION PHASE					FOLLOW - UP PHASE		
	session 1	session2	session3	session4	session5	session 6	session 7	session 8	session 9	session10	session11	session12
Questions	1	0	1	0	3	2	2	2	2	2	2	2
Emotional behaviors	0	0	0	0	0	1	1	1	2	0	1	1
Participation in activities	0	1	1	1	2	1	2	3	2	2	2	3
Attempts to attract attention / interest	1	0	0	1	2	2	3	2	2	2	2	1
INITIATIONS	2	1	2	2	7	6	8	8	8	6	7	7
RESPONSES	1/6 =0. 17	0/4 =0	1/5 =0. 2	1/5 =0. 2	3/6 =0. 5	4/6 =0. 67	5/7 =0. 71	4/6 =0. 67	4/6 =0. 67	2/4 =0. 5	2/4 =0. 5	4/6 =0. 67

Appendix 8.

Measurement of Initiations and Responses for Dimitris

	BASELINE PHASE			INTERVENTION PHASE					FOLLOW - UP PHASE		
	session1	session2	session3	session4	session5	session6	session7	session8	session9	session10	session11
Questions	2	2	2	3	3	3	2	3	3	2	3
Emotional behaviors	1	1	0	1	1	1	1	1	1	1	1
Participation in activities	1	2	2	3	3	2	3	3	3	3	3
Attempts to attract attention / interest	1	1	2	2	3	3	3	2	2	2	2
INITIATIONS	5	6	6	9	10	9	9	9	9	8	9
RESPONSES	1/3= 0.33	1/3= 0.33	1/3= 0.33	5/8= 0.63	4/7= 0.57	4/7= 0.57	5/7= 0.71	4/6= 0.66	4/7= 0.57	4/7= 0.57	4/7= 0.57

Appendix 9.

Measurement of Initiations and Responses for Giorgos

	BASELINE PHASE				INTERVENTION PHASE					FOLLOW - UP PHASE		
	session 1	session2	session 3	session 4	session 5	session 6	session7	session 8	session 9	session10	session11	session12
Questions	1	1	1	0	2	2	2	2	2	2	2	2
Emotional behaviors	1	1	0	1	1	1	2	1	1	0	1	1
Participation in activities	0	1	1	1	2	1	1	2	2	2	1	2

Attempts to attract attention / interest	1	1	1	1	1	2	2	2	2	2	1	1
INITIATIONS	3	4	3	3	6	6	7	7	7	6	5	6
RESPONSES	1/3 =0. 33	1/5 =0. 2	1/4 =0. 25	1/4 =0. 25	5/9 =0. 56	4/7 =0. 57	3/6 =0. 5	4/9 =0. 44	3/7 =0. 43	3/7 =0.4 3	4/7 =0.5 7	3/6 =0.5

Appendix 10.

Measurement of Initiations and Responses for Ioanna

	BASELINE PHASE					**INTERVENTION PHASE**								**FOLLOW - UP PHASE**		
	session1	session 2	session3	session4	session5	session 6	session 7	session 8	session9	session 10	session 11	session 12	session 13	session 14	session 15	session 16
Questions	0	0	0	0	0	1	1	0	1	1	0	1	0	1	0	1
Emotional behaviors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Participation in activities	0	0	1	0	0	0	0	0	0	1	1	1	1	0	1	0
Attempts to attract attention / interest	0	0	0	0	0	0	1	1	0	1	1	0	1	1	0	0
INITIATIONS in BASELINE PHASE	0	0	1	0	0	1	2	1	1	2	2	2	2	2	1	1
RESPONSES in BASELINE PHASE	0/4 = 0	1/8= 0.13	0/6 = 0	0/3 = 0	0/5 = 0	1/4= 0.25	1/4= 0.25	1/4= 0.25	2/5 = 0.4	1/4= 0.25	2/5= 0.4	2/5= 0.4	2/5= 0.4	2/6= 0.33	2/6= 0.33	2/6= 0.33

Appendix 11.

Measurement of Initiations and Responses for Thanasis

	BASELINE PHASE				**INTERVENTION PHASE**									**FOLLOW - UP PHASE**		
	session1	session2	session3	session4	session5	session6	session7	session8	session9	session10	session11	session12	session13	session14		
Questions	1	0	0	1	1	1	1	1	1	1	1	1	1	1		
Emotional behaviors	0	0	0	0	0	0	0	0	1	1	0	0	0	0		
Participation in activities	0	0	1	0	0	0	0	1	0	0	1	1	0	0		
Attempts to attract	0	1	0	1	1	1	1	1	1	1	1	0	0	1		

attention / interest														
INITIATIONS in BASELINE PHASE	1	1	1	2	2	2	2	3	3	3	3	2	1	2
RESPONSES in BASELINE PHASE	1/3 =0.33	1/3 =0.33	1/3 =0.33	3/6 =0.5	3/6 =0.5	2/5 =0.4	2/5 =0.4	2/5 =0.4	3/6 =0.5	3/6 =0.5	3/6 =0.5	2/5 =0.4	3/6 =0.5	2/5 =0.4

SPANISH SUMMARY

CAPÍTULO I – MARCO TEÓRICO

1.1 Definición

El término "Trastorno del Espectro Autista " (TEA) se utiliza en la literatura como sinónimos para describir una amplia gama de trastornos del neurodesarrollo que tienen tres características comunes: alteración de la interacción social e interacción interactiva, interacción interactiva limitada y patrones de conducta repetitivos (Wetherby & Prizant, 2001). Según el DSM-IV, la Sociedad Estadounidense de Psiquiatría (1994) y los sistemas taxonómicos de la Organización Mundial de la Salud (ICD-10) (1997), los TEA incluyen una serie de trastornos congénitos como el trastorno autista, el trastorno de Rett, la desorganización pediátrica, el trastorno de Asperger y Trastorno diseminado del desarrollo no identificado (autismo atípico). El trastorno autista se considera el trastorno primario y los demás trastornos se apartan de este patrón original, variando tanto en la gravedad de los síntomas como en el número de áreas de desarrollo afectadas. A veces, solo hay una manifestación parcial del trastorno y, entonces, los individuos no exhiben el triple total de desviaciones asociadas con el trastorno del autismo (Lord et al., 2000). La creación del Manual Diagnóstico y Estadístico de los Trastornos Mentales DSM-V fue crucial, ya que se combinaron todos los trastornos del espectro autista, teniendo este nombre común (American Psychiatry Association, 2013).

1.2 Causas del autismo

Las causas y el tratamiento del autismo han sido objeto de gran interés de investigación durante décadas. Los científicos concluyen que el trastorno causado por el autismo no es el resultado de una sola causa. Entre las causas del trastorno del espectro autista se encuentran factores biológicos como anomalías, trastornos metabólicos y genes o incluso virus que afectan el sistema biológico de una persona y es probable que se activen incluso durante el embarazo (Frith, 1989). La mayoría de los estudios indican que los estudiantes con TEA tienen más signos de disfunción cerebral que los estudiantes típicos y aproximadamente el mismo número que los estudiantes con retraso mental (DeMyer et al. 1981). Sin embargo, estas causas por sí solas no provocan autismo a menos que se combinen con agentes biológicos.

1.3 Formas básicas de autismo

El primer científico que se ocupó del autismo y publicó el primer estudio sistemático fue el psicólogo infantil Leo Kanner, a quien se hace referencia en el artículo de Harris (2018). Observó que la incapacidad adquirida para relacionarse con las personas, la falta de desarrollo del lenguaje, la persistencia y el comportamiento estereotipado eran las razones que alejaban a los autistas de la convivencia con el medio ambiente de manera común al resto de nosotros. Llamó a esta condición "autismo infantil temprano" (Kanner, 1943) porque los síntomas aparecieron desde la infancia. El autismo infantil, como se mencionó en el párrafo anterior, es un trastorno del desarrollo que ocurre antes de los 3 años de edad del niño y tiene la característica de una funcionalidad y desarrollo anormal en al menos una de las siguientes áreas:

a. Interacción social
b. El lenguaje empleado en la comunicación social.
c. Juego simbólico

Este trastorno se presenta de tres a cuatro veces más en niños de que en niñas (ICD-10, 1992). Para hacer el diagnóstico, las anomalías del desarrollo deben haber ocurrido antes de los 3 años, aunque el síndrome se puede diagnosticar a cualquier edad. Los criterios diagnósticos se detallan en el siguiente párrafo. Como se mencionó anteriormente, un individuo para ser caracterizado como autista debe tener un conjunto de seis o más objetos de 1, 2 y 3, con al menos dos de 1 y uno de 2 y 3:

1. Desviación cualitativa en la interacción social, manifestada por al menos dos de los siguientes:

a. una derogación manifiesta del uso de muchos comportamientos no verbales, como el contacto de la mirada, la expresión facial, la postura y los gestos para regular su transacción social;
b. incapacidad para desarrollarse a un nivel de desarrollo similar al de sus compañeros;
c. falta de participación espontánea en disfrutes, intereses o logros con otras personas (por ejemplo, con una incapacidad para señalar, plantear o resaltar temas de interés);
d. falta de reciprocidad social o emocional;

2. Derogación de la calidad en la comunicación, expresada en al menos uno de los siguientes:

a. retraso o falta total de desarrollo del lenguaje hablado (que no va acompañado de un intento de reposición a través de formas alternativas de contacto con el habla, como gestos o imitación);
b. en personas con habla suficiente, una clara derogación de la capacidad de comenzar o continuar;
c. tener una conversación con otros;
d. uso estereotípico y repetitivo del lenguaje o uso del lenguaje idiosincrásico;
e. falta de variedad, juego de roles espontáneo o imitación social, dependiendo del nivel de desarrollo,

3. Patrones de comportamiento de intereses limitados, repetitivos y estereotipados y actividades, manifestadas por al menos uno de los siguientes:

a. compromiso limitado con uno o más estereotipos y tipos limitados;
b. de interés, que es anormal, ya sea en tensión o en foco;
c. adhesión aparentemente rígida a hábitos o costumbres específicas no funcionales;
d. modales cinéticos estereotipados y repetitivos (por ejemplo, golpes o giros;
e. manos o dedos o movimientos complejos de todo el cuerpo);
f. trato persistente con partes de objetos

Dentro del espectro reconocido por la CIE 10, existe una gran variabilidad. Cada persona con autismo tiene sus propias características personales. La misma habilidad puede variar entre niños y niñas y el mismo niño/a, de una edad a otra. Debido a esta variabilidad y la dificultad de separar los problemas de interacción social, comunicación y estereotipos de conductas obsesivas-compulsivas, es preferible utilizar herramientas específicas que controlen la sintomatología del autismo (Howlin, 1998). A partir de la experiencia clínica, se ha observado que los individuos suelen tener una combinación de características autistas y relativamente rara vez se encuentran todas las características de un síndrome como tales. Es más útil categorizar por nivel de habilidad que en base a la categorización teórica en subgrupos. Además, las características que

se encuentran en los estudios de casos de personas con trastorno del espectro autista son el mantenimiento de un conjunto estereotipado de movimientos y comportamientos repetitivos que, a menudo, los padres no perciben rápidamente. Además, hay una falta de humor e imaginación, junto con la disminución de la tendencia a la creatividad, mencionada anteriormente. En este sentido, son frecuentes las reacciones intensas, así como la agresividad de la persona con este trastorno en los casos de cambio o cancelación de su programa (Stasinos, 2013). Por supuesto, la aparición de la comorbilidad también provoca dificultades en el curso del aprendizaje, como lo es la aparición del retraso mental (Stasinos, 2013). Además, se ha observado la tendencia del niño/a al juego simbólico, que se asocia tanto a la falta de imaginación como a déficits a nivel cognitivo y conductual, como la comprensión del comportamiento de los demás (Herrera et al., 2008). También es importante el énfasis en la implementación del juego social, ya que puede mejorar desde niño tanto las habilidades sociales como su lenguaje y habilidades mentales. Con respecto a la información anterior, también existen investigaciones que muestran que la persona, con la intervención adecuada, se interesa más por el juego y toma más iniciativa (Tsamitrou & Agaliotis, 2010). Las personas con este trastorno se enfrentan a problemas en la autogestión y el autoservicio, es decir, en la capacidad de manejar situaciones sencillas, como la limpieza. Dado que las personas a menudo carecen de habilidades de autocontrol, se necesita una intervención para mejorar tanto la capacidad de autogestión como la capacidad de generalizar ciertas habilidades en una amplia gama de situaciones (Gena et al., 2014).

1.4 Síntomas del autismo

De acuerdo con Laushey y Heflin (2000), las deficiencias centrales en el comportamiento social deben verse como la característica definitoria de los niños y niñas con TEA. Las personas con autismo muestran una falta de interés por otras personas, no buscan e incluso evitan el contacto y la interacción con adultos y niños. Específicamente, estos individuos carecen de iniciativas de interacción pero también de capacidad de respuesta a las iniciativas de interacción social entre pares o adultos (Loveland & Tunali-Kotoski, 2005). La mayoría de las personas con autismo son indiferentes y, a menudo, sienten pánico por la presencia de otros niños, sin jugar ni interesarse en desarrollar relaciones amistosas con sus compañeros. Es interesante que incluso cuando su interés por los demás aumenta en ocasiones, estas personas tienen

dificultades para adquirir habilidades sociales básicas (Carter et al., 2005). Los niños/as que son deficientes en habilidades sociales no tienen las características de comportamiento necesarias para interactuar con los demás de acuerdo con las convenciones sociales. Este déficit puede afectar tanto el desarrollo académico como el social. Para estos sujetos, las deficiencias en las habilidades sociales pueden afectar las interacciones con la familia, los compañeros y otros adultos. Posteriormente, las habilidades sociales limitadas pueden afectar su capacidad para lograr hitos de desarrollo normales y establecer relaciones familiares y con compañeros satisfactorias (Krasny et al., 2003).

1.5 Evaluación y Diagnóstico del Autismo

La evaluación psicológica y clínica de los individuos con autismo son necesarias para tener una imagen completa de sus fortalezas y debilidades. La evaluación comienza con un historial de los padres y madres del sujeto para recopilar información sobre las etapas de desarrollo del niño/a, las preocupaciones tempranas y el curso del trastorno. Luego, evalúa el nivel de desarrollo del este, el cociente de inteligencia y sus características de comportamiento en “conducta adaptativa” en la vida diaria.

En este punto vale la pena referirse al DSM - V. Manual Diagnóstico y Estadístico de los Trastornos Mentales - Quinta Edición (DSM - V), actualizado en mayo de 2013, ya es una autoridad diagnóstica universal en el campo de la psiquiatría. El DSM - V es la nueva versión del DSM - IV e incluye cambios significativos en los criterios de diagnóstico. Normalmente, en la versión revisada, el número de diagnósticos descritos es significativamente mayor (541 frente a 383). Además, el término "trastorno del espectro autista" ha reemplazado al término "trastornos difusos del desarrollo" y representa a aquellas personas que tienen síntomas comunes. Además, el Trastorno del Espectro Autista es una categoría diagnóstica que consta de ciertas subcategorías que se han incorporado a este término. Las subcategorías ahora incluyen el trastorno de la comunicación social, con el síndrome de Asperger, el autismo y el trastorno difuso del desarrollo eliminados, sin especificar lo contrario. El Trastorno de la Comunicación Social se refiere a individuos que tienen déficits en sus relaciones sociales pero que no exhiben conductas estereotipadas y repetitivas (American Psychiatry Association, 2013). Según la Asociación Americana de Psiquiatría (2013), las personas con trastorno del espectro autista, según el DSM - V, tienen rasgos comunes y síntomas divididos en

dos grupos. Típicamente, el primer grupo se refiere a los déficits en la interacción social y la comunicación en general; mientras que el segundo grupo se relaciona con movimientos estereotipados y repetitivos, pero también con el número limitado de intereses y funciones. Además, la gravedad de la manifestación de los síntomas se divide en tres subcategorías y se acompaña de indicadores relevantes. Después de todo, todos los individuos con ciertas características del trastorno pertenecen a un gran grupo llamado trastorno del espectro autista (American Psychiatry Association, 2013).

De acuerdo con el Manual Diagnóstico y Estadístico de los Trastornos Mentales (DSM-5), las personas con TEA tienen las características de la siguiente tabla.

Tabla 1

Manual Diagnóstico y Estadístico de los Trastornos Mentales (DSM-5)

A. Déficits persistentes en la comunicación social y la interacción social en múltiples contextos, como se manifiesta por lo siguiente, actualmente o en la historia (los ejemplos son ilustrativos, no exhaustivos, ver texto): **1.** Déficits en la reciprocidad socioemocional, que van, por ejemplo, desde un enfoque social anormal y el fracaso de una conversación normal de ida y vuelta; a un intercambio reducido de intereses, emociones o afecto; a la falta de iniciar o responder a las interacciones sociales. **2.** Déficits en los comportamientos comunicativos no verbales utilizados para la interacción social, que van, por ejemplo, desde una comunicación verbal y no verbal mal integrada; a anormalidades en el contacto visual y lenguaje corporal o déficits en la comprensión y uso de gestos; a una falta total de expresiones faciales y comunicación no verbal. **3.** Deficiencias en el desarrollo, mantenimiento y comprensión de las relaciones, que van, por ejemplo, desde dificultades para adaptar el comportamiento a diversos contextos sociales; a las dificultades para compartir juegos imaginativos o para hacer amigos; a la falta de interés en los compañeros.
B. Patrones de comportamiento, intereses o actividades restringidos y repetitivos, manifestados por al menos dos de los siguientes, actualmente o en el historial (los ejemplos son ilustrativos, no exhaustivos; consulte el texto): **1.** Movimientos motores, uso de objetos o habla estereotipados o repetitivos (p. ej., estereotipias motrices simples, alinear juguetes o voltear objetos, ecolalia, frases idiosincrásicas). **2.** Insistencia en la uniformidad, adhesión inflexible a las rutinas, patrones ritualizados o comportamiento verbal no verbal (p. ej., angustia extrema ante pequeños cambios, dificultades con

las transiciones, patrones de pensamiento rígidos, rituales de saludo, necesidad de tomar la misma ruta o comer todos los días). **3.** Intereses muy restringidos y fijos que son anormales en intensidad o enfoque (p. ej., fuerte apego o preocupación por objetos inusuales, interés excesivamente circunscrito o perseverante). **4.** Hiper o hiperreactividad a la información sensorial o intereses inusuales en los aspectos sensoriales del entorno (p. ej., indiferencia aparente al dolor/temperatura, respuesta adversa a sonidos o texturas específicos, oler o tocar objetos en exceso, fascinación visual con las luces o el movimiento) . **5.** Especifique la gravedad actual: la gravedad se basa en deficiencias en la comunicación social y patrones de comportamiento restringidos y repetitivos. (Vea la tabla de abajo.)
C. Los síntomas deben estar presentes en el período de desarrollo temprano (pero es posible que no se manifiesten por completo hasta que las demandas sociales excedan las capacidades limitadas o pueden estar enmascarados por estrategias aprendidas en etapas posteriores de la vida).
D. Los síntomas causan un deterioro clínicamente significativo en las áreas sociales, ocupacionales u otras áreas importantes del funcionamiento actual.
E. Estas alteraciones no se explican mejor por discapacidad intelectual (trastorno del desarrollo intelectual) o retraso global del desarrollo. La discapacidad intelectual y el trastorno del espectro autista con frecuencia coexisten; Para hacer diagnósticos comórbidos de trastorno del espectro autista y discapacidad intelectual, la comunicación social debe estar por debajo de lo esperado para el nivel de desarrollo general.

Nota: Las personas con un diagnóstico DSM-IV bien establecido de trastorno autista, trastorno de Asperger o trastorno generalizado del desarrollo no especificado deben recibir el diagnóstico de trastorno del espectro autista. Las personas que tienen déficits marcados en la comunicación social, pero cuyos síntomas no cumplen los criterios para el trastorno del espectro autista, deben ser evaluados para el trastorno de la comunicación social (pragmática).

1.6 Tratamiento- Intervenciones

1.6.1 Principios básicos

El Consejo Nacional de Investigación (2001) de los Estados Unidos de América, ha esbozado algunos de los principios básicos que subyacen en cualquier programa de abordaje terapéutico para personas con autismo. Estos principios son los siguientes:

1. La intervención terapéutica debe basarse en programas individualizados y especializados con objetivos didácticos específicos en todos los ámbitos del desarrollo. El Programa Educativo Individualizado debe tener en cuenta las diferentes necesidades

y capacidades de cada sujeto y las necesidades de su familia. El plan de estudios de las actividades del individuo y el entorno educativo, dentro y fuera del aula, debe estar adecuadamente diseñado y estrictamente estructurado para permitir que el Currículo Personalizado se implemente de la mejor manera posible, así como de una manera más sistemática.

2. La intervención debe comenzar inmediatamente después del diagnóstico del trastorno autista porque la intervención temprana es un factor crucial en el diagnóstico de la persona con autismo.

3. Para que cualquier programa sea efectivo, cada programa debe implementarse durante al menos 25 horas a la semana y durante todo el año del calendario, no solo el año escolar.

4. Al comienzo del tratamiento, especialmente para los sujetos muy pequeños, se deben brindar repetidas oportunidades de enseñanza a lo largo del día, con cada sesión de tratamiento inicialmente debe ser relativamente corta (alrededor de 15-20 ´ por sesión).

5. La educación debe llevarse a cabo individualmente o en grupos muy pequeños de personas con un nivel de desarrollo relevante. Idealmente, la relación niño-terapeuta debería ser de 1:1 y definitivamente no excede de 1:2.

6. Todos los miembros de la familia, con los padres y madres en un papel coterapéutico, deben participar activamente en el proceso terapéutico. Al mismo tiempo, se debe brindar asesoramiento y apoyo a la familia para obtener la ayuda que necesitan para enfrentar bien las dificultades de criar a un niño o niña con autismo.

7. El progreso del individuo debe ser revisado periódicamente y con regularidad, con miras a reformar el Programa de Educación Individualizada y así enseñar al niño o niña con autismo, de acuerdo con sus necesidades en constante cambio. La falta de progreso durante períodos prolongados (3 meses o más) indica la necesidad de una intervención más intensiva, lograda, ya sea reduciendo la relación terapeuta/alumno; o aumentando las horas de educación especial y tratamiento.

8. El personal debe ser evaluado y supervisado teniendo en cuenta el progreso del sujeto. El personal debe estar altamente capacitado en el uso de métodos psicoeducativos, especialmente para niños o niñas con autismo.

9. Los individuos con autismo deben recibir apoyo de personal debidamente capacitado para que puedan integrarse en actividades regulares y extracurriculares con sus compañeros, donde hay muchas oportunidades para interactuar con ellos. Los objetivos de inclusión, por supuesto, no deben ser abolidos, sino compatibles con el Programa de Educación Individualizada del sujeto.

10. Se debe dar prioridad a la enseñanza de la comunicación espontánea y funcional, la interacción social, las habilidades de juego (especialmente con los compañeros) y las habilidades cognitivas durante la intervención. Al mismo tiempo, se deben implementar estrategias para tratar los problemas de conducta, como la estrategia de análisis funcional de la conducta. En general, hay que tener en cuenta que la adquisición de nuevas habilidades es fundamental para reducir los problemas de conducta. Finalmente, dependiendo de las necesidades del sujeto, se deben enseñar habilidades escolares de valor funcional. Por tanto, se debe hacer hincapié en la generalización y el mantenimiento de nuevas habilidades en el entorno natural del sujeto (por ejemplo, en casa y en la escuela).

Los currículos conductuales siguen todos los principios asociados con el tratamiento de individuos con autismo y enfatizan el principio básico de que todos los niños o niñas tienen la oportunidad de aprender y ser promovidos cognitiva, emocional y socialmente, siempre que su enseñanza y tratamiento se manejen adecuadamente. La falta de progreso se analiza como un trato inadecuado y no como una debilidad del sujeto. Con un tratamiento intensivo y adecuado, los niños o niñas con autismo tienen una mejora inmediata y notable. Además, el grado de mejora depende del potencial del estos. (Géna, 2002).

1.6.2 Los escenarios de intervención

El escenario de intervención no puede ser predeterminado, pero está definido por las necesidades de cada sujeto y su familia. Dependiendo de la edad, intereses y necesidades del individuo, la intervención se puede realizar en el hogar, en centros de

educación especial, en la escuela, o incluso en otros lugares como comercios, parques infantiles y otros lugares.

1.6.3 Intervención escolar

Hay tres casos de niños o niñas con autismo que asisten a la escuela:

a. Integrados en clases especiales exclusivamente para sujetos con autismo que se encuentran dentro de la escuela pública
b. En una clase especial para niños o niñas con todo tipo de trastornos
c. Incluidos en la clase con la presencia de personal especial que apoye al alumno autista.

En los tres casos en los que la intervención se realiza en la escuela, aún se espera que los padres y madres apoyen el programa en el hogar. La asistencia a la escuela difiere notablemente de la asistencia a centros especializados en el tratamiento del autismo (Harris et al., 2005).

La ventaja más importante de las intervenciones escolares es que permiten que el sujeto disfrute de los beneficios del entorno escolar natural. Además, incluyen oportunidades para la interacción social entre los estudiantes autistas con sus compañeros cuando juegan, comen o hacen ejercicio. Por tanto, los niños o niñas con autismo tienen la oportunidad de acostumbrarse a la rutina de un salón de clases normal (por ejemplo, levantar la mano para participar en la lección, sentarse en su asiento, etc.) y adquirir habilidades importantes que promueven su escuela e integración social. Sin embargo, no suelen estar disponibles formas de apoyo especiales para el sujeto y su familia en la escuela pública, como la educación para padres y madres; y el asesoramiento en el hogar; o un programa de educación infantil individual; que pueden ser cruciales para la evolución del individuo. Finalmente, el programa de intervención satisfactoria en la escuela puede depender de la presencia de un docente de educación especial encargado de adaptar al sujeto a la escuela (Harris et al. , 2005). En resumen, es importante referir que si bien el ámbito de la intervención puede jugar un papel en el resultado terapéutico, ciertamente no es un factor determinante. La calidad e intensidad de la intervención, la edad del sujeto al inicio de la intervención y la participación activa de la familia son algunos de los factores más importantes en el desarrollo de niños o niñas con autismo.

1.6.4 Habilidades Sociales

En la literatura, por supuesto, se enfatiza la dificultad de formular una definición de las habilidades sociales, ya que es un fenómeno multifactorial, y la personalidad, la edad y el género del individuo, el lenguaje y el entorno social o la inteligencia juegan un papel importante, así como el entorno cultural del individuo (Merrell y Gimpel, 1998). Sin embargo, se puede entender que la ausencia de habilidades sociales implica que la persona no puede interactuar positivamente con los demás en su entorno, lo cual está directamente relacionado con la conducta delictiva, pero también con el bajo rendimiento académico del sujeto (McClelland, Morrison, & Holmes, 2000). Una característica clave de las habilidades sociales es su distinción entre comportamientos observables y aquellos que no son fáciles de detectar. En cualquier caso, su adquisición ayuda al individuo a gestionar bien las situaciones y adaptarse a las nuevas circunstancias (Elksnin, 1998).

1.6.5 Inclusión

El desarrollo de políticas y estrategias para la inclusión de estudiantes con necesidades educativas especiales en las escuelas ordinarias ha sido una preocupación para la comunidad educativa europea desde la década de los 80. Según los principios de la Comisión Europea, la inclusión es "educación inclusiva" y brinda una base importante para garantizar la igualdad de oportunidades para las personas con discapacidad y sistemas educativos flexibles que satisfagan las diversas necesidades de estos estudiantes.

1.6.6 Un modelo de intervención inclusivo

La educación inclusiva es un desafío particular para las escuelas que deben brindar igualdad de oportunidades a todos sus estudiantes. Por supuesto, para lograr esto, es necesario involucrar a los docentes, quienes son el factor más crítico en la educación inclusiva, ya que están llamados a implementarla. Sin embargo, es necesario enfatizar que la inclusión no es solo la educación de estos estudiantes en un aula general, sino también la educación emocional y social aunada a la motivación de los estudiantes. Por tanto, para los estudiantes con autismo, el objetivo es integrar no solo el aprendizaje sino también desde el ámbito social dentro del aula e interactuar con sus compañeros de clase mediante el desarrollo de relaciones (Webster, 2016).

La eficacia de la educación inclusiva depende de factores que dificultan su implementación adecuada. En concreto, según Lindsay (2007), surgen las siguientes cuestiones: (a) en cuanto a la definición e interpretación de la idea, ya que la categorización del sujeto con dificultades educativas especiales y el grado de severidad de estas dificultades son discutidas por algunas personas; (b) cuestiones relacionadas con la distinción de categorías de necesidades educativas especiales; (c) cuestiones identificadas con cambios en la idea de educación escolar como el hecho de que la "inclusión" ya no puede interpretarse como algo contrario a la "separación"; (d) por el uso práctico y operativo de apoyo educativo especializado; e) la eficacia del proceso educativo.

1.6.7 Actitud de los docentes sobre la inclusión

La educación inclusiva en Grecia es un tema que plantea muchos desafíos, ya que traerá cambios críticos en la sociedad griega (Soulis, Georgiou, Dimoula & Rapti, 2016). Según Zoniou-Sideri & Vlachou, (2006), aunque todos los docentes manifestaron que aceptarían a un sujeto con discapacidad en su aula, preferirían elegir una clase diferente que incluyera estudiantes de diferentes culturas, etnias, idiomas, religiones en lugar de estudiantes con discapacidades. Asimismo, aunque la mayoría de los docentes argumentaron que los individuos con discapacidad pueden ser educados en la escuela general, al mismo tiempo, manifestaron que su educación en la escuela especial sería mejor para ellos. Además, consideran a los profesores de educación especial más aptos para la educación de sujetos con necesidades educativas especiales (Pen 2008). Por otra parte, según Webster (2016), el liderazgo es un factor clave en las escuelas inclusivas y uno de los factores más importantes en los programas inclusivos es la creencia en los líderes escolares de que los estudiantes con autismo pueden aprender y lograr logros en el entorno escolar con el apoyo adecuado. Los padres y madres de sujetos con discapacidades que están integrados en las escuelas ordinarias argumentaron que sus hijos juegan mejor y son más favorecidos socialmente por sus compañeros con un desarrollo típico (Handleman et al., 2005). Sin embargo, están decepcionados por el esfuerzo de integrar a sus hijos con discapacidad en las escuelas regulares, debido a las dificultades que enfrentan, en ausencia del apoyo adecuado y la escolarización requerida (Zoniou-Sideri, 1998).

1.6.8 Actitud del estudiante sobre la inclusion

En general, los investigadores coinciden en que se debe trabajar y tener en cuenta la actitud de los iguales de los niños o niñas con discapacidad en la implementación de la educación inclusiva en las escuelas de educación general. La aceptación social de los sujetos con necesidades especiales por parte de los estudiantes que asisten a escuelas generales es un factor muy importante para el éxito de la educación inclusiva. Por esta razón, Roberts (2015) argumenta que las características del trastorno de autismo son un desafío tanto para los estudiantes como para la escuela, que a menudo luchan por satisfacer sus necesidades. Los estudiantes con TEA frecuentemente muestran dificultades en la capacidad cognitiva (Ashburner, Ziviani y Rodger 2010), en el uso de un lenguaje de alto nivel y funciones ejecutivas deterioradas como enfocar y mantener su atención, administrar su tiempo de manera efectiva y monitorear o corregir mismos (Liss et al., 2001, Rosenthal et al., 2013, Steffie, 2020). Además, a menudo experimentan dificultades para jugar, formar y mantener relaciones con sus iguales. La investigación ha demostrado que estas dificultades sociales persisten en la adolescencia y la adultez temprana (Schall y McDonough 2010). Más específicamente, suelen tener dificultades con los componentes del juego, como tomar turnos, cambiar actividades, calidad simbólica reducida y dar el control de las actividades de juego preferidas (MacDonald et al. 2009, Kent et al 2019). Según la Asociación Estadounidense de Psiquiatría (2013), los estudiantes con TEA pueden mostrar dificultades de comunicación social que pueden causar aislamiento social, autolesiones, conductas estereotipadas y sensibilidad emocional (Cappadocia, Weiss y Pepler 2012). Otra dificultad es la probabilidad de ser intimidado que aumenta en los estudiantes con TEA que en los estudiantes con desarrollo típico (van Roekel, Scholte y Didden 2010). Asimismo, presentan dificultades para jugar, formar y mantener relaciones sociales (Kentet al 2019) y según Schall y McDonough (2010) duran hasta la adolescencia. Por tanto, según Odom et al. (2011), el programa de inclusión exitoso debe involucrar una intervención activa para promover el compromiso, la participación social y el desarrollo infantil.

1.6.9 Evaluación de las intervenciones

La técnica de enseñanza directa ha demostrado ser un enfoque efectivo en el desarrollo de habilidades de transición de una actividad a otra, de un salón de clases a otro y para mantener un nuevo comportamiento (Sainato et al., 1987). Además, el apoyo de un maestro en individuos autistas ayuda a aumentar no solo las respuestas, sino también

las iniciativas que reciben, así como una interacción más prolongada (Odom & Strain, 1986).

En cuanto a la estrategia de autogestión, se ha demostrado que ayuda a los estudiantes a controlar su comportamiento y no depender de las indicaciones de las familias y docentes y, al mismo tiempo, generalizar la nueva habilidad en entornos naturales (Galanis, 2018, Lee et al. , 2007, Koegel et al., 1999). Además, al usar estas estrategias, los estudiantes pasan más tiempo, disminuyen los comportamientos menos disruptivos y crean un ambiente más positivo en el salón de clases (Reid, 1996). Cuando el sujeto ha adquirido habilidades de autogestión y no necesita la orientación de ningún docente, puede tener más oportunidades de interactuar con sus compañeros y evitar la estigmatización (Harrower & Dunlap, 2001). Esto permite al profesorado dedicar más tiempo al proceso de aprendizaje que al manejo del comportamiento de los estudiantes con autismo (Galanis, 2018). Además, educar a los niños y niñas con autismo para que autogestionen sus interacciones sociales con sus compañeros puede generalizar estas habilidades a nuevas condiciones en compañeros que no conocen el programa de integración (Handleman et al., 2005). Finalmente, la autogestión necesita mucho menos contacto directo con el docente de apoyo paralelo, lo que lo hace ideal para el entorno del salón de clase, la comunidad y el hogar.

Las estrategias basadas en pares promueven el desarrollo de formas de comportamiento social más naturales y socialmente más válidas, en comparación con la enseñanza directa, donde los terapeutas suelen enseñar reacciones específicas (Laushey, 2000). Además, en esta estrategia no es necesario planificar la generalización (Rogers, 2000), los compañeros actúan como "agentes de intervención" y, como resultado, esto reduce los requisitos del personal escolar (Chan et al., 2009). Se ha demostrado que PMI es eficaz en el desarrollo de habilidades de interacción social con compañeros de desarrollo típico (Handleman et al., 2005) y pueden beneficiarse de una mejor comprensión de la diversidad del autismo y con la satisfacción moral de la ayuda que ofrecen (Kamps et al., 1998) . Hay investigaciones que demuestran la eficacia de este enfoque para aumentar las interacciones sociales y el compromiso académico de los estudiantes con trastorno del espectro autista en entornos escolares (Bene, Banda y Brown, 2014; Chang y Locke, 2016; Watkins et al., 2015, Brain , 2019). Según Chan et al. (2009), PMI es un método socialmente válido y práctico para el desarrollo de habilidades sociales y se adapta a la escuela y otros entornos como cafés, patios de

recreo, etc. Las intervenciones mediadas por pares también se pueden usar para enfocarse en múltiples habilidades a la vez (p. ej., Pierce & Schreibman, 1995). En este sentido reducen la necesidad de apoyo continuo de un adulto (Rogers, 2000. Weiss & Harris, 2001), son económicos en su aplicación y están condicionados a promover la generalización de nuevas habilidades (Gena, 2006, Kamps et al., 2002, Rogers, 2000).

Con el fin de mejorar los resultados para los niños y niñas con TEA, muchas investigaciones se han centrado en desarrollar métodos efectivos para la inclusión de estos en entornos naturales con las intervenciones más populares basadas en la participación de pares. Los compañeros de clase con un desarrollo típico son importantes modelos a seguir para la imitación y tienen comportamientos sociales y comunicativos deseables. En particular, en PMI (intervención mediada por pares) los compañeros típicos juegan un papel activo en ayudar a sus compañeros con autismo. La interacción social con los pares tiene un impacto en el desarrollo de una persona durante la infancia y repercute en el éxito académico, social y emocional y en la vida personal en general (Medina et al., 2016, Reichow et al., 2013).

CAPÍTULO II - META-ANÁLISIS

Aunque hay muchos estudios de revisión que han demostrado la efectividad de las habilidades sociales en las interacciones sociales de los niños y niñas con TEA con sus compañeros, existe la necesidad de investigación adicional en los estudios más recientes publicados en la última década. Aunque las revisiones sobre el tema de las intervenciones de habilidades sociales generalmente se han centrado en cómo pueden mejorar la interacción social de los niños y niñas con TEA con sus compañeros (White 2007, Watkins 2014, Chang 2016), existe la necesidad de saber cómo interactúan ambos agentes. Además, estudios previos han indicado que las investigaciones futuras deberían incluir no solo datos de cantidad, sino también de calidad en el campo de la intervención mediada por pares (Chang, 2016, Licciardello 2008, Owen-DeSchryver 2008). Owen-DeSchryver (2008) considera que existe la necesidad de analizar mejor los cambios cualitativos en las interacciones sociales mediante el uso de un sistema de recopilación de datos que permita medir estos en la duración de las interacciones o en algunos aspectos del comportamiento de los estudiantes. Según Licciardello (2008), las futuras investigaciones deberían analizar la calidad de las interacciones entre pares con la medida de la duración del juego interactivo, con el porcentaje de intercambios

sociales que incluyeron conversación y el tipo de actividades que se asocian con mayor frecuencia con la respuesta recíproca. Sin embargo, se sabe menos sobre cómo la literatura en el campo ha explorado el valor agregado de diferentes medidas cuantitativas y cualitativas, y específicamente sobre la medida de las habilidades comunicativas. Esta evidencia motiva a investigar con un estudio de metanálisis cómo los estudios de intervención entre pares han implementado datos cualitativos y cuantitativos para evaluar el impacto de las intervenciones sociales. El propósito de este metanálisis es: (a) resumir las características de las intervenciones; (b) explorar las habilidades que se han implementado en los estudios de PMI; (c) analizar las diferencias de los estudios controlando la calidad del diseño; y (d) proporcionar recomendaciones para la práctica y futuras investigaciones.

2.1 Método de metanálisis

El proceso de metanálisis concluyó con la búsqueda de estudios en revistas internacionales, siendo un total de 15 artículos los que cumplieron con los criterios de inclusión en este metanálisis.

2.2 Criterios de inclusion

Los criterios de inclusión fueron: (1) todos los participantes deben tener un diagnóstico de TEA; (2) incluir niños de 4 a 13 años; (3) estudios realizados exclusivamente en entornos inclusivos, es decir, espacios en los que el estudiante con TEA comparte el contexto y las actividades con sus iguales (Watkins et al., 2015); (4) estudios que utilizan un diseño de investigación experimental que permitió el análisis directo del efecto de la intervención.

2.3 Extracción de datos

Para la extracción de datos, cada estudio analizó las siguientes categorías: (1) características de los participantes (número, género, edad, etnia y nivel de funcionamiento); (2) descripción de los comportamientos y habilidades objetivo; (3) descripción de la intervención; (4) diseño de la investigación; (5) duración; (6) resultados de la intervención, incluida la intervención, el mantenimiento, los efectos de generalización, la fidelidad al tratamiento y la capacidad entre evaluadores.

2.4 Eficacia de la intervención

En cuanto a la efectividad de los estudios incluidos en este metanálisis, se informan dos tamaños de efecto no paramétricos para estudios de diseño de caso único que proporcionan un análisis visual de los resultados de la intervención de cada estudio, los indicadores PND e IRD.

2.5 Discusión

El estudio describió 15 intervenciones mediadas por pares que se han desarrollado y evaluado para aumentar las interacciones entre los participantes con TEA y los compañeros de desarrollo típico. Los resultados son semejantes a los de estudios previos de revisión y metanálisis que indican que las intervenciones que tienen como objetivo aumentar la interacción social entre los estudiantes con TEA con sus compañeros en entornos inclusivos son cada vez más efectivas para los niños con TEA (Watkins y Mark O'Reilly, 2019; Chang y Locke, 2016; Watkins et al., 2014). Los esquemas de los estudios anteriores indican que PMI es un enfoque de intervención prometedor y efectivo para niños y niñas con TEA, ya que la mayoría de los estudios revisados informaron resultados positivos y los hallazgos del estudio son consistentes con los hallazgos de revisiones anteriores y metanálisis que examinaron la efectividad. del PMI (Aldabas, 2019; Martinez, 2019; Chapin, 2018; Ramos et al., 2018; Chang y Locke 2016; Zagona 2016; Ezzamel y Bond 2016; Watkins 2015; Whalon 2015; Trottier 2011; Sperry 2010 ; Chan 2009. Además, el hecho de que la mayoría de los estudios tuvieran resultados de calificación moderados respalda los hallazgos de estudios anteriores que afirman que el PMI tiene resultados positivos en el comportamiento social de los niños y niñas con TEA. Solo un estudio informó resultados cuestionables y un estudio tuvo hallazgos negativos.

La mayoría de los participantes de los estudios incluidos eran hombres y pertenecían a un nivel de funcionamiento alto de TEA. La mayoría del género masculino en los estudios del PMI se justifica por la frecuencia de aparición del trastorno en los niños. El alto nivel de funcionamiento de los participantes de los estudios fortalece los resultados de estudios previos que destacan el éxito de PMI en niños y niñas con autismo de alto funcionamiento y los mejoran. Por tanto, existe la posibilidad de que futuros estudios investiguen la efectividad de esta intervención en estudiantes con autismo de bajo funcionamiento. Sin emargo, aunque los hombres participan de manera

abrumadora, todas las intervenciones de PMI parecen tener resultados positivos también en las mujeres participantes y este hecho amplía la eficacia de la intervención.

Por otra parte, en todos los estudios los lectores pueden suponer alguna evidencia sobre el nivel de funcionamiento de los participantes, ya sea a partir del coeficiente intelectual o de la información del escritor, ya que el trasfondo cultural no es tan fácil de entender. La cultura a la que pertenecen los participantes se conoce en una minoría de los estudios analizados (n=4), pero la etnicidad es una variable importante que debe tenerse en cuenta al diseñar una intervención. (Pierce et al., 2014, Watkins y O'Reilly, 2015). Los niños y niñas con TEA que son inmigrantes de otros países o viven en países subdesarrollados pueden necesitar un enfoque de intervención con diferentes perspectivas. La duración de la intervención no parece afectar el éxito del programa. Estos hallazgos confirman los resultados de Watkins y O 'Reilly (2015), quienes afirman que las intervenciones breves pueden producir efectos fuertes. Es lógico que un tratamiento que dure 6 horas en total pueda proporcionar estrategias más completas en los participantes que uno que dure 2 horas en total, pero de acuerdo con estos hallazgos no podemos confirmar esta posibilidad.

La mayoría de los estudios utilizaron modelos y juegos de roles como parte de la fase de capacitación entre pares. Desde una perspectiva, este hecho parece que estas estrategias son un buen paquete de tratamiento que se puede combinar con varios tipos de intervención para enseñar comportamientos. Por otro lado, los compañeros pueden necesitar una estrategia más creativa que promueva la consideración crítica para pensar y planificar solos formas de interactuar con los participantes con TEA (Chang y Locke, 2016).

Los resultados de las intervenciones analizadas producen efectos de moderados a altos en la conducta objetivo. Curiosamente, no hay un número significativo de intervenciones que informaron un aumento en todos los comportamientos objetivo para niños y niñas con TEA. Algunos de estos estudios se identificaron como efectivos en el análisis visual, pero no tuvieron éxito en todos los comportamientos objetivo de los participantes con TEA. Además, en general hay resultados positivos sobre la generalización, el mantenimiento y la validez social del PMI que respaldan aún más el uso de este método. Wang y Spillane (2009), en un estudio de metanálisis de intervenciones de habilidades sociales basadas en evidencia para niños y niñas con

autismo, afirmaron que las familias y los docentes deberían creer que una estrategia de intervención es efectiva y apropiada para hacer un esfuerzo por implementarla y aumentar la fidelidad de la intervención. La mayoría de los estudios seleccionados han medido la validez social y la mitad de ellos (n=8) evaluaron la fidelidad al tratamiento de la intervención. Aunque los datos de mantenimiento y generalización son indicadores importantes de la efectividad general de la intervención, no se han informado en la mayoría de los estudios. Si bien el éxito del tratamiento depende en gran medida de la fidelidad de la implementación, la mayoría de los estudios incluidos no la han medido. Solo hay dos estudios que nos proporcionan una medición completa de estos indicadores significativos de la eficacia de la investigación (Brain & Mirenda, 2019; Katz & Girolametto, 2015). Los PMI son prácticas basadas en evidencia, pero los creadores de este enfoque deben elegir las estrategias con cuidado, así como también quién las implementa. En caso de que los docentes sean los implementadores del programa PMI, existe la necesidad de una capacitación cuidadosa para aumentar la fidelidad del tratamiento.

2.6 Limitaciones

Entre las limitaciones de esta investigación está que el estudio evaluó solo una pequeña cantidad de intervenciones mediadas por pares publicadas entre 2008 y 2020. Puede ser beneficioso analizar más estudios para obtener una mejor conclusión, pero los estudios realizados hasta hace 15 años, puede tener componentes de intervenciones menos efectivos. Otra limitación es el hecho de que esta síntesis incluyó solo estudios de diseño de caso único sin estudios de ensayos controlados aleatorios y es posible que los resultados de estos estudios sean más débiles que los de los ensayos controlados aleatorios. La revisión futura debe investigar indicadores y moderadores importantes de estudios de ensayos controlados aleatorios con una muestra más grande de participantes con TEA. Este estudio se centró principalmente en la sesión de tratamiento y verificó solo si los estudios tenían datos de generalización, fidelidad al tratamiento y validez social sin analizarlos más a fondo. Pero necesitamos tres componentes adicionales del plan, como la generalización y el mantenimiento, la fidelidad de la implementación y la validez social, que ayudan a garantizar el éxito. Por esta razón, los estudios futuros deben centrarse en una investigación detallada sobre cómo los estudios implementan estos componentes fuera de la intervención para tener resultados a largo

plazo. Los estudios futuros deberían proporcionar más evidencia sobre las características de los participantes con TEA. Específicamente, necesitan informar el nivel de funcionamiento y el origen étnico de los participantes con TEA para saber para quién las estrategias de PMI serán más eficientes y el investigador podría interpretar mejor los comportamientos sociales del niño o niña problemático, si es así. Además, existe la necesidad de ampliar la literatura sobre la eficacia de PMI en participantes con TEA de bajo funcionamiento, así como la influencia de los compañeros en la mejora de las habilidades académicas de los participantes con TEA. Finalmente, los estudios futuros deben recopilar datos posteriores a la intervención.

CAPÍTULO III - METODOLOGÍA Y DISEÑO DE LA INVESTIGACIÓN

3.1 Definición del problema

Si bien la inclusión de niños y niñas con discapacidad en entornos escolares está aumentando con los años (Locke et al., 2012), no está claro que las asociaciones sociales de estos niños puedan están beneficiándolos de alguna manera. Los niños y niñas con autismo en la escuela general suelen jugar separados de sus compañeros y rara vez toman iniciativas para interactuar con ellos (Sigman y Ruskin, 1999). Como se menciona en el Capítulo II, las intervenciones mediadas por pares han sido particularmente exitosas y constituyen una de las dos metodologías de intervención más prometedoras que mejoran las habilidades sociales de los niños con TEA (Chang y Locke, 2016; Chan et al., 2009; Reichow y Volkmar, 2010). Según Owen De-Schryver, et al. (2008), cuando un equipo entrenado de niños y niñas comienza a interactuar con sus compañeros TEA, anima al resto de compañeros no entrenados a imitar su ejemplo. Brain y Mirenda (2019) realizaron una intervención mediada por pares para estudiantes de secundaria con trastorno del espectro autista. Los resultados mostraron un aumento en la participación y los actos comunicativos entre los participantes y compañeros de TEA y el programa de intervención demostró ser apropiado para que lo use el personal escolar capacitado. Según Brain y Mirenda (2019), sería útil para los estudiantes con

TEA que tienen intereses limitados crear una intervención que amplíe las actividades de juego apropiadas junto con PMI. Sivaraman y Fahmie (2018), identificaron que al incorporar preferencias comunes para hacer coincidir los intereses de los participantes con TEA y los compañeros típicos, se podría mejorar la socialización de los niños con autismo y sus compañeros. En este estudio, tres niños con TEA de edad temprana participaron en actividades de juego con sus compañeros que se seleccionaron en función de sus evaluaciones de preferencias. No hubo más entrenamiento en habilidades sociales, ni enseñanza directa, pero el compromiso con los compañeros y las iniciaciones entre ellos se incrementaron efectivamente durante el juego.

Además, Koegel et al. (2013) integraron los intereses predilectos en las actividades habituales a la hora del almuerzo de los jóvenes con TEA en entornos inclusivos. Intereses comunes identificados mediante el uso de entrevistas a participantes TEA y luego, incorporados a las actividades a la hora del almuerzo. El compromiso social y las iniciaciones de los participantes con TEA aumentaron y las actividades estructuradas fueron agradables tanto para los adolescentes con TEA como entre sus compañeros. Este estudio es una versión extendida del estudio de Koegel et al. (2012), donde los niños y niñas en edad escolar participaron en clubes de almuerzo especiales que se construyeron de acuerdo con las preferencias de los niños y niñas TEA para promover la participación de los compañeros al brindarles oportunidades para participar en estas actividades y socializar con los niños objetivo. Según Sivaraman y Fahmie (2018), un futuro estudio basado en intereses comunes con algo de capacitación para el compañero de desarrollo típico podría aumentar estos resultados. Los intereses comunes son un tema particularmente interesante para futuras investigaciones ya que pueden posibilitar el establecimiento de una amistad con mantenimiento en el tiempo.

Este estudio tuvo como objetivo: a) extender esta línea de investigación con una intervención más prolongada que combine tanto la intervención de PMI como la actividad social que enfaticen los intereses comunes entre los estudiantes de escuela primaria con TEA y sus compañeros de clase; b) evaluar la efectividad de este paquete de intervención en profesores de Educación Especial que trabajan en la promoción de la interacción social de los niños con TEA y sus compañeros.

3.2 Preguntas de investigación

Las preguntas que surgen de la revisión de la literatura y el contexto en el que se explorarán son:

- Existe una relación funcional entre el apoyo de pares y los estudiantes con TEA durante el período de recreo en la escuela?
- Hay algún incremento en los actos comunicativos realizados por los estudiantes con TEA hacia sus pares y por los pares hacia los estudiantes con TEA?
- Podría una intervención basada en las preferencias comunes de los niños y niñas pequeños con TEA y sus compañeros conducir a un aumento en las iniciaciones sociales y la respuesta durante el día escolar?
- Cómo se han evaluado los resultados del alumno objetivo, los compañeros y el nivel escolar en relación con las intervenciones mediadas por compañeros para estudiantes con TEA?

3.3 Diseño de la Investigación

Se utilizan múltiples diseños de referencia para examinar la relación funcional entre la intervención y la conducta objetivo (Hersen & Barlow, 1984; Kazdin, 1982). En este diseño, se examinan dos o más comportamientos para especificar la condición de referencia y luego se implementa una intervención. La variable independiente se introduce en un momento diferente para cada individuo o comportamiento, y existen diferentes tipos de diseños experimentales con múltiples líneas de base, como los diseños que involucran la intervención de diferentes sujetos experimentales, comportamientos y condiciones (Kazdin, 1982). En primer lugar, el investigador recopila datos de la línea de base de todos los individuos que participan en la investigación. Cuando el desempeño de todos los participantes fluctúa en niveles similares y las tasas no se desvían significativamente, se les aplica la intervención. Luego se deben cambiar los datos de la persona que recibió una intervención, mientras que el resto se mantiene en los niveles de línea de base. La eficacia de la intervención se demuestra si la conducta de cada persona o sujeto cambia en la dirección deseada, en el momento en que se introduce la intervención (Kazdin, 1982). La ventaja más importante del diseño de línea de base múltiple en una intervención basada en la escuela es que los resultados pueden generalizarse entre comportamientos y no es necesario intervenir en cada comportamiento por separado (Sulzer-Azaroff y Mayer, 1991).

3.4 Participantes

Se reclutaron cinco grupos de participantes para esta investigación con trastorno del espectro autista (TEA) y veinticinco compañeros.

- Participantes con TEA

Los cinco estudiantes de TEA viven con sus familias naturales que pertenecen a la mitad de la jerarquía social y asisten a escuelas primarias públicas de Atenas, Creta y la isla de Mitilene. En la escala GARS-2, todos los participantes puntuaron en el rango leve/moderado de autismo. La siguiente tabla brinda más información sobre cada estudiante de TEA.

Tabla 2

Características de los participantes con TEA

NAME	GENDER	CHRONOLOGICAL AGE	GARS-2 score	
			Communication	Social interaction
Nikos	Male	9-3m	27	28
Dimitriss	Male	8-7m	19	23
Giorgos	Female	8-5m	19	25
Ioanna	Male	9-8m	32	38
Thanasis	Male	8-2m	23	25

- Participantes pares

Cinco compañeros de clase participaron en la intervención de capacitación de compañeros. La selección de los compañeros que iban a participar en el programa de intervención se hizo en base a observaciones en el recreo y recomendaciones de los docentes de aula. Cuando recomiendan una cantidad de compañeros potenciales, los maestros de educación especial eligen a los compañeros que van a participar en el estudio.

Los pares fueron seleccionados con base en los criterios de McEvoy et al. (1990), que incluyen: (a) la disposición del estudiante a participar; (b) asistencia constante del estudiante a la escuela; (c) el cumplimiento de las instrucciones; y (d) la capacidad del estudiante para reemplazar cualquier trabajo escolar perdido durante el entrenamiento. Los factores de exclusión para la participación fueron una historia de mala relación entre los niños y niñas con TEA con un compañero.

3.5 Marco y Condiciones

Los niños uy niñas que participaron en la investigación asistían a escuelas primarias griegas cercanas a su lugar de residencia. Todo el programa de intervención se ha realizado en las escuelas primarias donde asistían los niños y niñas con TEA. La recolección de datos se llevó a cabo durante el período de recreo donde se promovieron interacciones sociales espontáneas entre los individuos. El programa de intervención se aplicó desde el personal capacitado de la escuela y más precisamente, el maestro de educación especial que es responsable de los TEA. No hubo cambios en el ambiente escolar para las necesidades de la investigación y ningún maestro o investigador interfirió en la condición de juego libre excepto por la necesidad de prevenir comportamientos desafiantes.

3.6 Instrumentos de la Investigación

Las herramientas de investigación que se han utilizado salvo la forma de iniciaciones y respuestas (apartado 3.3.2 de este capítulo), han sido un libro de cuentos relacionado con los TEA y un juego que fomenta los intereses comunes entre los participantes.

El libro llamado “To avgo” (Vakirtzi, 2014), en inglés “The egg”, se refiere a un niño con TEA. La historia de este libro será leída a los compañeros de los estudiantes ASD por los maestros que participan en este estudio. Los materiales adicionales incluyeron algunas tarjetas de referencia visual que tenían el nombre de la habilidad y los formularios de finalización que se entregaron a cada estudiante para completar su respuesta e incluir las respuestas del resto del grupo. Los temas de la herramienta tratan áreas de interés de la vida diaria del estudiante y pretendía cultivar y promover la discusión/conversación entre los miembros del grupo para lograr la interacción social, lingüística y la respuesta a dicha interacción. En cuanto al diseño del juego, se han creado 8 fichas de interés y 6 fichas de cumplimentación que se entregan a cada alumno

del grupo para que cumplimente las respuestas de los demás. Cada estudiante toma una tarjeta de la pila de tarjetas y hace una pregunta a cada estudiante por turno, mientras que, al mismo tiempo, los demás completan sus respuestas en la hoja de respuestas. El propósito es que los participantes entren en comunicación y conversación directa discutiendo sus intereses/preferencias, mientras encuentran posibles opciones comunes con sus compañeros de clase.

3.7 Variables

3.7.1 Variables independientes

En la siguiente tabla se presenta la denominación de las variables y su correspondiente categorización.

Tabla 3

Categorización de variables

Variables	Categories
Gender	Male
	Female
Type of student	Typical student (T.S.)
	Autistic student (A.S.)

3.7.2 Variables dependientes

Las variables del estudio han sido seleccionadas de acuerdo con los resultados del metaanálisis realizado por la investigadora antes de la implementación de la intervención (Capítulo 2). Este estudio examinó dos variables dependientes a través de sondas de observación. Estas variables incluyeron la frecuencia de las iniciaciones sociales realizadas por los estudiantes con ASD a sus compañeros y la frecuencia de las respuestas realizadas por los estudiantes con ASD a las iniciaciones de los compañeros.

El número de iniciaciones y respuestas se registraron en un formulario especial diseñado por el investigador. Este formulario se presenta en el Apéndice 1.

Las iniciaciones sociales incluyeron: (a) preguntas hechas por estudiantes con TEA a uno o más compañeros (p. ej., "¿quieres jugar conmigo?"); (b) expresiones emocionales, como gestos espontáneos (p. ej., chocar los cinco, abrazos) y expresiones faciales (p. ej., sonreír, contacto visual); (c) participación en actividades por su propia cuenta; (d) intentos de llamar la atención definidos como vocalizaciones; (e) invitaciones definidas como ofertas verbales o gestuales para iniciar una comunicación (por ejemplo, “vamos a jugar”). Un intento iniciado tenía que incluir al menos una consonante y un sonido vocálico (p. ej., soy…, soooo…, eeemmm).

Las respuestas se definieron como respuestas verbales y no verbales a las iniciativas de los compañeros para la interacción. Si una respuesta a la iniciación de pares fue asistida por un maestro, entonces no se incluyó en las mediciones. El campo de respuestas se codificó calculando el número de respuestas exitosas dividido por el número total de preguntas de sus pares. El rango fue 0-1.

3.8 Personal escolar e investigador capacitados

Los niños y niñas asistían a escuelas primarias públicas y todos los participantes de ASD estaban bajo la supervisión de un maestro especialmente capacitado, graduado de la universidad y especializado en educación especial. El primer participante TEA (Nikos), estuvo acompañado por la investigadora mientras que los otros cuatro participantes fueron acompañados por docentes especializados en programas educativos individualizados para estudiantes con autismo. Su experiencia laboral en programas de integración de niños con TEA en la escuela primaria fue de dos a seis años.

Antes del inicio del programa, el autor capacitó en el procedimiento de intervención a todos los profesores especializados que acompañan a los participantes del TEA junto con los profesores de aula de los alumnos objetivo. La capacitación se llevó a cabo una semana antes del inicio del programa de intervención en un taller de dos horas donde el investigador explica el proceso y modelado por el personal de la escuela. El investigador se aseguró de que todos los intervencionistas llevaran el registro y el material didáctico necesario.

La recopilación de datos en todas las fases para el primer participante y sus compañeros de clase fue realizada por el autor en cooperación con el maestro de clase que recolectó datos en un número predeterminado de sesiones, para verificar el acuerdo entre observadores. En cuanto a los otros cuatro participantes de ASD y grupos de pares, la recopilación de datos fue realizada por asistentes de educación especial capacitados en cooperación con maestros de aula capacitados para verificar el acuerdo de las observaciones.

3.9 Medición

La medición se realizó en doce sesiones. Cada sesión duró 10 minutos durante el período de recreo de cada día escolar. El observador principal fue el maestro de educación especial capacitado que apoyó al alumno objetivo en la escuela. Los observadores secundarios fueron el maestro de clase junto con otro miembro del personal de la escuela que accedió a participar en las observaciones para ayudar en la investigación para el acuerdo entre evaluadores. Los observadores no tenían interacción con los estudiantes, ya que tenían que ser discretos durante la duración de la investigación, pero estaban disponibles para intervenir en caso de cualquier comportamiento no deseado. Los observadores se saludaron con la cabeza al comienzo de cada intervalo. Los datos se recogieron en forma de interacción social que se creó a partir del investigador. Las herramientas necesarias para los observadores fueron lápices y un diario.

3.10 Fases del diseño

Al comienzo del proyecto, los maestros de apoyo paralelo de estudiantes ASD completaron la escala de calificación de autismo de Gilliam (GARS) en cooperación con las familias.

3.10.1 Línea base

Durante la línea de base, el Profesor de Apoyo Paralelo observó y anotó en un formulario especial (presentado en la sección 3.3.2 Variables dependientes) las interacciones sociales entre los estudiantes TEA y sus compañeros de escuela durante los períodos de recreo y juego libre.

3.10.2 Fase de Intervención/Entrenamiento de Pares

La capacitación entre pares ocurrió en tres fases, y cada fase duró de 30 a 40 min. La primera fase del entrenamiento consistió en leer y comentar una historia sobre un niño con autismo (Vakirtzi, 2014). Después de leer el libro, comenzó una conversación guiada sobre la importancia de las amistades entre pares para los niños y niñas con discapacidades en contraste con los maestros y los adultos. La fase dos consistió en una discusión sobre los intereses personales y el contacto social entre cada grupo a través de preferencias comunes. Luego, los maestros trataron de motivar al grupo a realizar la actividad/juego específico. Esta fase tuvo como objetivo acercar a los pares al estudiante TEA para identificar si tenían alguna preferencia común que desconocieran antes. En la fase tres, el intervencionista enseñó a sus compañeros estrategias para interactuar con un niño con TEA.

3.10.3 Fase de Seguimiento

En la fase de seguimiento, no hubo retroalimentación de los docentes ni sesiones de capacitación entre pares. En el mismo entorno y condiciones de intervención, los niños actuaron con naturalidad sin aviso ni elogios de los adultos.

3.11 Estrategias de análisis de datos

El análisis de datos se basó en el análisis visual de gráficos, el uso de términos estadísticos descriptivos, como la media (promedio), la desviación estándar (DE), el porcentaje de aumento o disminución desde el inicio, la intervención y las fases de seguimiento, lo cual es consistente con una sola diseños de casos (Kazdin, 2018).

3.12 Confiabilidad

La confiabilidad de la investigación se garantizó al verificar el nivel de acuerdo de las observaciones de observadores independientes que proporcionaron el registro sistemático de las variables de datos.

CAPÍTULO IV – RESULTADOS

En este capítulo, las frecuencias de iniciaciones y respuestas para cada estudiante ASD se presentan en los gráficos 1,2,3,4,5 a continuación.

Gráfico 1

Iniciaciones y respuestas de Nikos

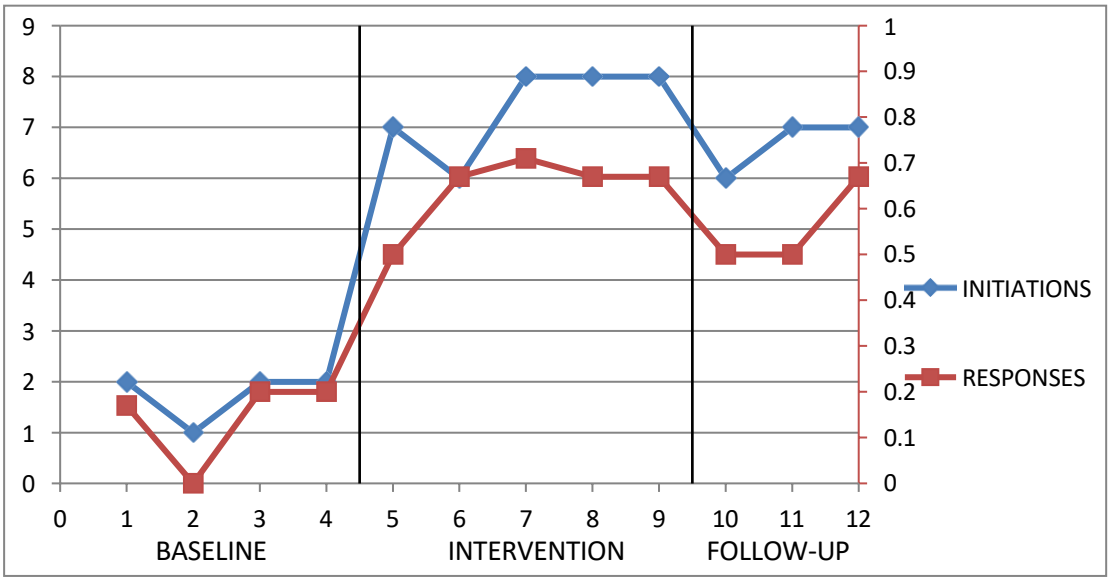


Gráfico 2

Iniciaciones y respuestas de Dimitris

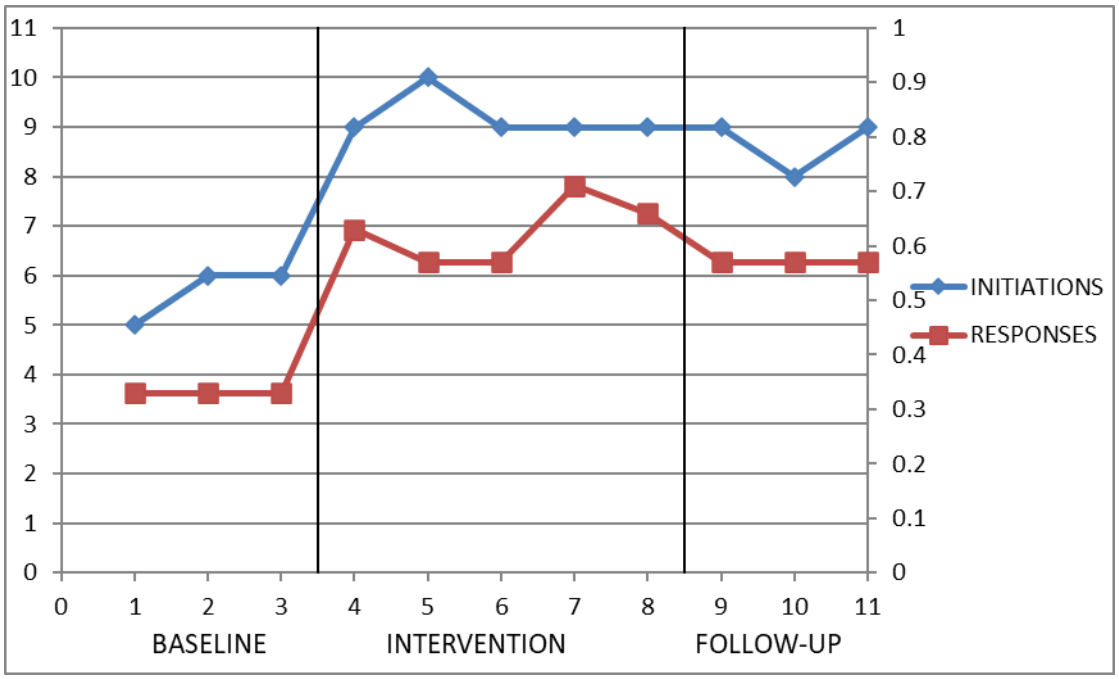


Gráfico 3

Iniciaciones y respuestas de Giorgos

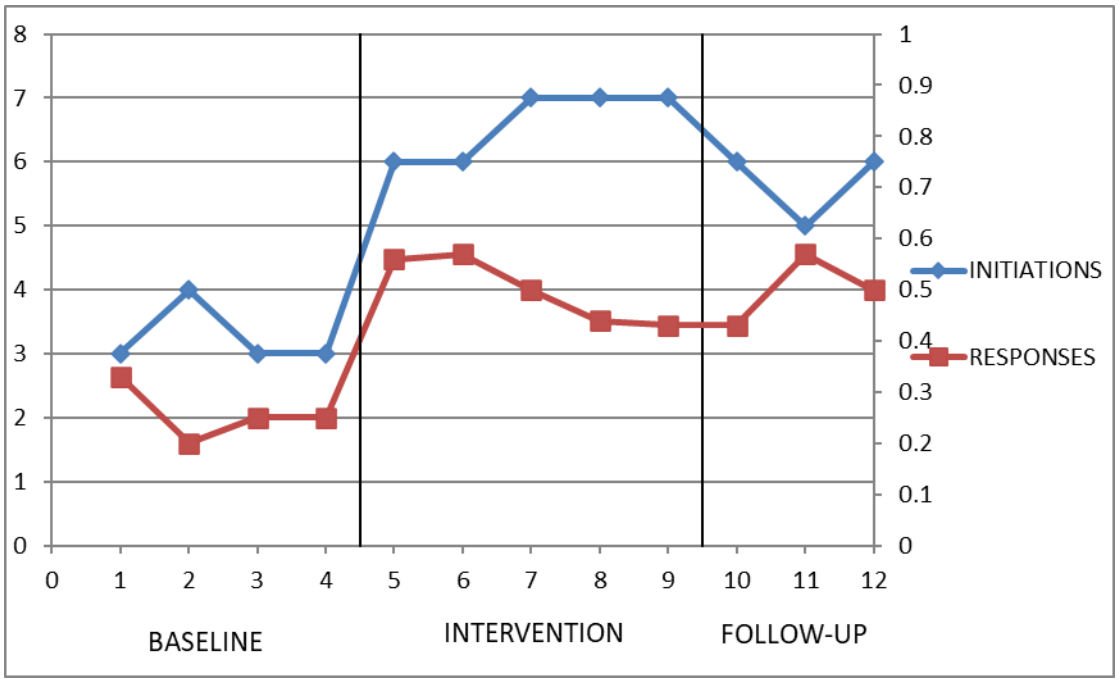


Gráfico 4

Iniciaciones y respuestas de Ioanna

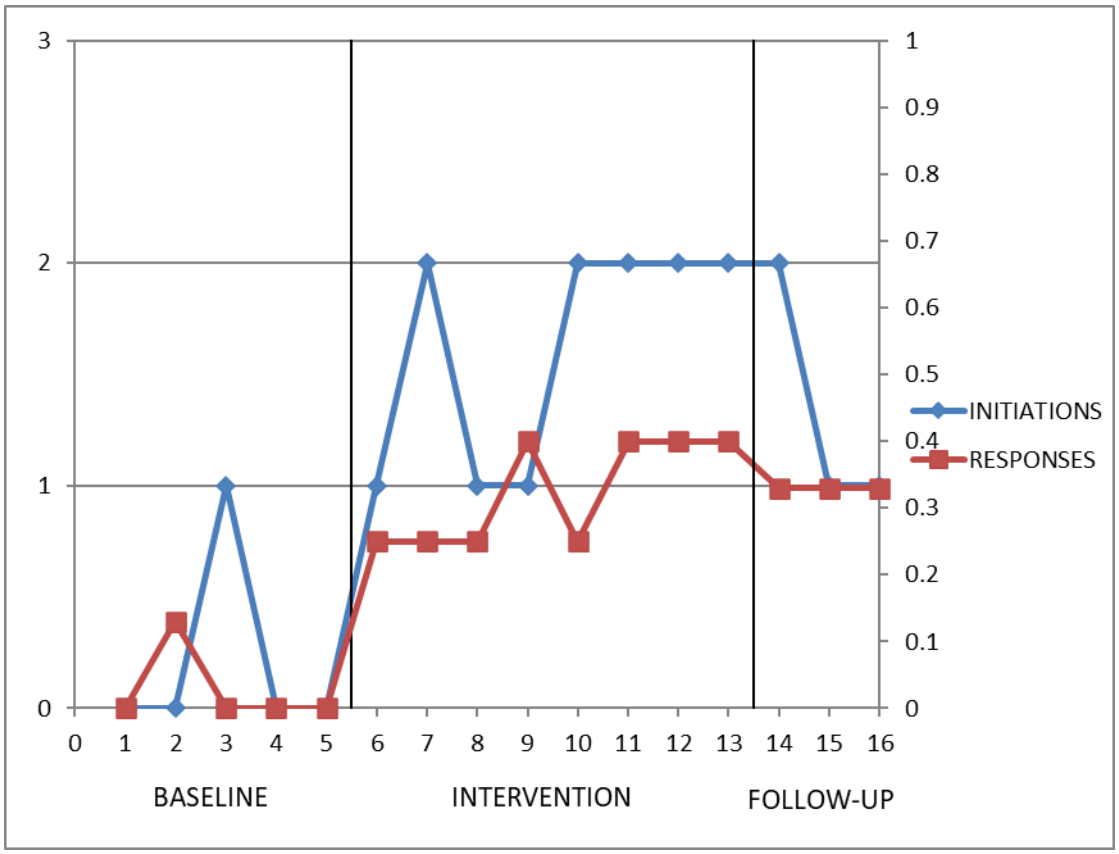
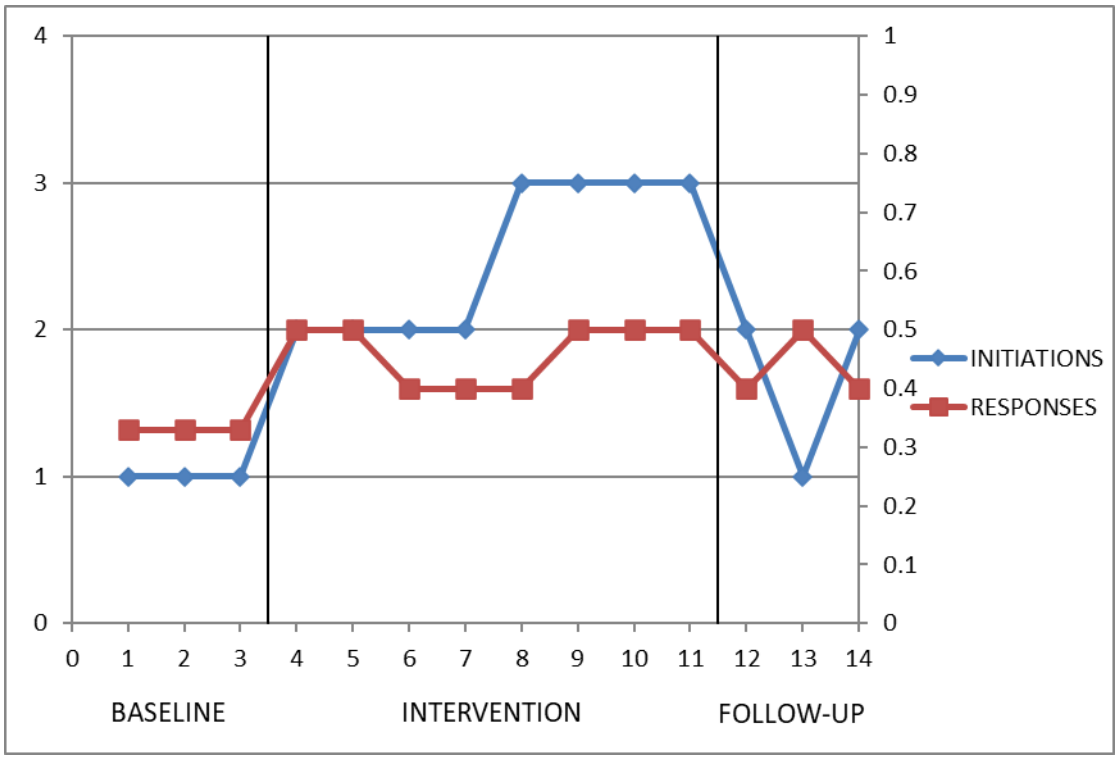


Gráfico 5

Iniciaciones y respuestas de Thanasis



1. Discusión

Una evidencia importante de esta investigación fue: (a) el uso de una actividad de interés común para aumentar las interacciones sociales entre compañeros y estudiantes con TEA; (b) el uso de un entorno escolar para aumentar las interacciones sociales entre los estudiantes con TEA y sus compañeros; y (c) el hecho de que el programa de intervención será aplicado por el personal de la escuela. Confirmando la investigación previa sobre PMI, el estudio actual demuestra que la formación entre compañeros puede ser una estrategia útil para aumentar las interacciones entre compañeros y estudiantes con TEA (Brain & Mirenda, 2019; Owen et al., 2008; Chung et al., 2007; Kamps et al., 2002; Kohler et al., 2007; Lee et al., 2007; Sainato et al., 1987). En cuanto a los resultados de este estudio, se concluye que existe una necesidad emergente de brindar múltiples oportunidades para las interacciones sociales, no solo en grupos sociales no académicos sino también en entornos grupales con actividades académicas.

Hay varios factores que pueden haber contribuido al éxito de la intervención. En primer lugar, la formación de los compañeros incluía información sobre cómo responder de forma eficaz en sus interacciones con los alumnos con TEA. Además, la mayor

frecuencia de iniciaciones por parte de los estudiantes ASD podría ser una razón que les dio a los compañeros más oportunidades para responder. Además, la actividad de interés común dio a todos los estudiantes la oportunidad de expresar sus intereses e iniciar una conversación sobre ellos. Por último, la implementación de la intervención del personal de la escuela hace que todos los estudiantes se sientan cómodos con el proceso de las intervenciones. Luego, los comentarios proporcionados por sus maestros aumentaron su confianza. Estos son mostrados por las tasas de validez social en el grupo de pares.

2. Implicaciones y limitaciones

Los resultados de la investigación actual son representativos de tal necesidad de componentes de capacitación adicionales. La investigación futura también debe considerar si los déficits en la interacción social son causados por un déficit de habilidades (es decir, falta de habilidad) o un déficit de rendimiento (falta de interés o motivación) al desarrollar intervenciones para niños con TEA. Además, los estudios futuros deberían proporcionar más evidencia sobre las características de los participantes con TEA. Específicamente, necesitan informar el nivel de funcionamiento y el origen étnico de los participantes con TEA para saber para quién las estrategias de PMI serán más eficientes y el investigador podría interpretar mejor los comportamientos sociales del niño problemático si es así. Además, existe la necesidad de ampliar la literatura de PMI en entornos extraescolares para ampliar la socialización de los niños con TEA y verificar si los efectos de PMI pueden generalizarse en diferentes entornos. Por último, pero no menos importante, podría ser beneficioso investigar los efectos de la PMI en adultos con TEA al involucrar procedimientos de capacitación relacionados con la amistad y la participación social y el bienestar.

Además, es muy importante hacer referencia a la investigación piloto que se había realizado antes del estudio principal, donde el investigador aplicó el diseño de la metodología ABA a tres estudiantes con TEA. Este diseño no asegura que la variable independiente sea responsable de los cambios asociados en la respuesta. Entonces, finalmente se aplicó el diseño de línea base múltiple en lugar del diseño ABA. La investigación continua sobre la estrategia de PMI proporcionará una guía importante y fortalecerá los hallazgos de nuevas habilidades en la aceptación social de la población con TEA en entornos inclusivos.

El estudio presentado tiene algunas limitaciones. Los datos de generalización no se evaluaron y los estudiantes con TEA pueden volverse socialmente funcionales cuando las técnicas de comportamiento social se generalizan más allá de las condiciones de entrenamiento (Stokes & Baer, 1977). Por esta razón, el progreso hacia la inclusión de los estudiantes ASD se puede ayudar generalizando las metas del PMI en otros entornos naturales, como un patio de recreo privado donde los compañeros no son guiados ni supervisados por adultos. La mayoría de los estudios del PMI, como el presentado, se centran en explorar los efectos de este enfoque en alumnos funcionales con TEA donde la posibilidad de interacción con los compañeros es mayor. La investigación futura sobre PMI debería examinar el efecto de este enfoque para estudiantes con TEA no verbales u otros de bajo funcionamiento. Además, los investigadores podrían analizar la calidad de las interacciones entre compañeros para medir la duración del juego interactivo.

3. Conclusiones

El presente estudio reprodujo y amplió la investigación previa de PMI al demostrar que este enfoque puede aumentar con éxito las interacciones entre los estudiantes con TEA y sus compañeros. El presente estudio reprodujo y amplió la investigación previa de PMI al demostrar que este enfoque puede aumentar con éxito las interacciones entre los estudiantes con TEA y sus compañeros.