SAECULUM
Vol. 52, nr. 2, 2021, pp. 54 - 68
DOI : 10.2478/saec-2021-0018
Online ISSN 2601-1182

JOINT ATTENTION ABILITY IN AUTISM AND MENTAL DISABILITY. A MULTIPLE CASE STUDY

OVIDIU DAMIAN
"Lucian Blaga" University Sibiu
ovidiu.damian@ulbsibiu.ro

Title: "Joint Attention Ability in Autism and Mental Disability. A Multiple Case Study"

Abstract. A particularly important indicator in diagnosing autism is the deficit in joint attention. This concept refers to a socio-communicative, pre-linguistic ability, which is accomplished by shared gestures and mutual monitoring of the attention given to an object or a certain event (Adamson, Bakeman and Deckner, 2004; Slaughter and McConnell, 2003). Joint attention mechanism is considered a pivotal ability, its development determining other functional areas to progress. Therefore, our research focuses on the development of this ability seen as the basis for a subsequent functioning as close to the normal parameters as possible. A functional evaluation of the joint attention ability was conducted for the three cases involved in this research and the effects of an intervention plan meant to develop this behavior were evaluated. The therapeutic process was structured on stages and conceived in accordance with the particularities and characteristics of each case, these being the premises for the program's success. The positive results in acquiring this behavior are highlighted by the assessment of the therapy. This gives us the right to think that the therapy will have positive effects upon other developmental areas of these children, thus improving the quality of their lives.

Keywords: *autism; joint; attention; single subject experimental design; neuropsychological evaluation;*

Introduction

Autism is a neurobiological disorder affecting the development of the children in a pervasive way. It is considered the "central" disorder within the Autistic Spectrum Disorders (ASD) or the Pervasive Developmental Disorders (PDD) – the "official" designation used in the psychiatric systems of classification (DSM, ICD). The autistic spectrum shows many challenging manifestations, and developmental dysfunctions with neural and genetic origins. A certain cause of the autism is unknown at this moment.

When autism is accompanied by mental disability, it is easier to be diagnosticate. Difficulties regarding the diagnosis can occur among children and teenagers with medium or higher than medium intelligence.

While progressively building up during the second year of life, the autistic syndrome becomes patent by the age of 2 or 3. Then the following are observed: rigidity in thinking and behaving, disorder in imagination and imaginative play, repetitive, activities, focus on minor details (for example on clothing items rather

than on the person itself, on a part of a toy rather than on the whole toy); disorders in verbal and non-verbal communication, lack of the necessary abilities for conversation, failure in other people's emotions, gestures or thoughts, deficit in understanding and interpreting the messages sent by others and difficulties in social interaction, isolation or indifference and in the cases where social contact is initiated this is done in an inadequate manner, repetitively.

The specific cause of autism has not been discovered yet. However, scientific proof exists, confirming that autism's symptoms have multiple neurobiological causes, being, on the one hand, the consequence of a global developmental disorder, of dysfunctions of various systems and functions of the central nervous system. Despite these obvious anomalies of the brain in autism, scientists do not agree yet on which area(s) is (are) affected. Starting from neurochemical investigations, autopsies and brain scans, several areas of the brain were suggested as being those affected, thus causing autism. However, few specific differences were noticed in the brain of autistic persons.

At structural level, it was suggested that autistic persons` brain is larger and that there are anomalies of the cortex, that there might be structural and cell anomalies of the hippocampus, amygdale and cerebellum; there might be such anomalies, starting from microscopic ones and ending with highly visible ones, from errors of neuronal cells to defective development of the entire cell system.

At functional level, EEG anomalies were proved to exist, but no pattern was discovered specifically for autism, neither a weaker coordination between the regions of the brain. There are signs indicating a neurological disorder in autism: epilepsy, for example, is present in one third of autistic teenagers. Furthermore, autism associates with mental deficiency, abnormal nystagmus and abnormal preservation of some reflexes from childhood and of stereotypical movements.

At chemical level, (from blood and urine tests) some hypotheses were stated regarding dysfunctions of the neurotransmitters. High level of opioids, peptides and serotonin are also not fully validated suppositions.

On the other hand, the genetic factors must also be taken into consideration in most cases of autism. The pioneering studies of Bernard Rimland (1964), investigating a pair of autistic twins, suggested that the genetic factor influences the emergence of autism. His theory was confirmed by subsequent studies. At present it is thought that 15 or more genes are involved (none of the genes or specific groups of genes being validated). However, the main "suspects" are chromosomes 7q, 2q, 16p, chromosome X. Anomalies are present within the Neuroligin gene, which is involved in the increase of axons.

There are also other factors, non-genetic ones, involved in the emergence of autism. The interaction between the genetic potential and the biological pre- and peri-natal environment must also be considered. 10-15% of the cases of autism can be related to some chromosomal anomalies and genetic diseases (fragile X, tuberous sclerosis, neurofibromatosis, phenylketonuria), pre- or peri-natal infections (rubella, convulsive cough), early intoxications, metabolic disorders. Consequently, biologic, organic factors are responsible for the emergence of autism,

but definitely not the parents. They are not responsible for the emergence of the disorder, as Bettleheim argued, neither is the unhappy family environment, or the mother's stress during pregnancy, or an emotional trauma of the mother or of the child, or other psychological factors.

At present there are four established research paradigms trying to offer a logical explanation to this pervasive developmental disorder. *The Theory of Mind Paradigm* argues that there is a primordial cognitive deficit in autism, a deficit in representation, or, more precisely, a metarepresentation deficit. This deficit in creating and/or processing representations has, according to the authors (Wimmer, Perner, 1983; Leslie, 1994; Frith and Frith, 1991 cit. in O. Benga, 1997), major consequences upon these children, reflected in: the pretend play, understanding true or false beliefs, self-mental estate and other's mental estate. This paradigm is not fully accepted because it does not explain other autistic symptoms such as stereotypical aspects, obsessive behaviors, 3rd person speech etc. (Frith and Happe, 1994, cit. in O. Benga, 1997).

The *Frontal Lobes Paradigm* brings forward the deficiencies regarding metamemory. Injuries of the frontal lobe cause short-term memory deficiencies (the representations are not kept long enough to be processed) (Damasio and Anderson, 1994, cit. in O. Benga, 1997). This paradigm explains the stereotypical aspects, the lack of planning and the impulsiveness, which are so frequently encountered in autism. *The Central Coherence Theory* argues that the local visual information is processed in autism, rather than the global information, which explains why these children have such an amazing capacity of visually memorizing their routes. Finally, the *Attention Processes Paradigm* argues that there is hyperactivity in the ascending reticular activating system. It also argues that there is a higher level of opioid in the central nervous system of the children with autism, which could explain the decreased sensation of pain and thus the auto-aggressive behaviors. Its fourth argument is that a neurocerebral dysfunction could cause the deficit in attention (Courchesne, 1994, cit. in O. Benga, 1997).

Beyond the research labs, there are a tremendously high number of autistic cases, with extremely different and particular behaviors. Under the circumstances, the viable alternative is to develop and implement therapeutic-educational plans adapted for each case individually, and not seeking for a "therapeutic formula". Before engaging in any therapeutic intervention, a careful, detailed and global investigation of the case must be made. Early diagnosis of autism and the functional analysis (thus shifting from the nosologic classification to the identification and understanding of the particular problems of the case) are the premises of the intervention's success (Woods, Goldstein, 2003). This process is even more difficult when the cases are highly affected by this disorder, namely those autistic children who are considered "unassessable" because of their extremely severe condition.

A particularly important indicator in diagnosing autism is the deficit in joint attention. This concept refers to a socio-communicative, pre-linguistic ability, which is accomplished by shared gestures and mutual monitoring of the attention given to a certain object or event (Adamson, Bakeman and Deckner, 2004;

Slaughter and McConnell, 2003). This mechanism is considered a pivotal ability, its development determining other functional areas to progress. The delays in the development of this mechanism is one of the autism's first signs, identified even before the age of one (Ben-Itzchak and Zachor 2007; Landa 2018; MacDonald et al. 2014). As opposed to children with mental disabilities or language delay, only autistic children have this attentional deficit (Murza K. A., Schwartz J. B., Hahs-Vaughn D. L. and Nye C. 2016), this being a differentiation indicator of 80-90% between autistic children and children with other developmental disorders (Young N., Hudry K., Trembath D. and Vivanti G., 2016). For these reasons, special sections for evaluating this ability have been introduced in the screening and diagnosis instruments (CHAT, PL-ADOS etc.). Autistic children have as cardinal symptom the low interest in the social environment, meaning lack of connection with others, isolation, negativism. This deficit is also an early marker of the dysfunctions related to the social motivation, typical for autism (Mundy, 1995; Mundy et al.,1997). Joint attention offers the ground for shared experience, which is extremely important in acquiring language, vocabulary being assimilated during the joint attention episodes (Morales et al., 2000). Furthermore, this ability is connected to the development of "theory of mind" and pretended play - two sociocognitive abilities which develop later on and which are dysfunctional in autistic children. It is obvious that this behavior determines other areas to develop. According to scientists, this ability must be seen as a priority in intervention (Klinger and Dawson, 1992; Mundy and Crawson, 1997). Even in easy attention tasks – orienting towards additive stimuli – autistic children show a stronger deficit if the stimuli are natural, social or environmental (Dawson, Meltzhoff, Osterling, Rinaldi and Brown, 1998). These behavioral dysfunction patterns suggest as candidate factors related to the autistic symptomatology, the cerebral system involved in the social cognition mechanisms.

Studies analyzing injuries in animals or humans indicate that the amygdala, the hippocampus and the ventromedial cortex could act as a specialized system for processing the social stimuli (Bechara A., Damasio H. and Damasio A., R., 2000). Through the intervention upon this pivotal ability the benefic therapeutic outcomes are more substantial, the subsequent acquisitions are amplified while expenses and the time-span are considerably reduced.

During the past years, scientists have begun to systematically analyze strategies of intervention in order to develop this cardinal ability. Landry and Loveland (1989) and Lewy and Dawson (1992) studied the way in which social context can influence this behavior in autistic children. The conclusion was that, by simply manipulating some contextual factors, no significant changes occur.

For this reason, strategies of applied behavior analysis were developed having the objective targeted on forms and functions. This brings a lot more benefits than the classic, global approach of this disorder: learning in a pre-linguistic context (Warren and Yoder, 1998; Kaiser et al., 1992; Warren and Yoder, 1993), developmental interventions (Klinger and Dawson, 1992), intensive behavioral programs (Poulson, 1998; Tomasello, 1995) or dyadic intervention programs (Zecher, Hunt,

Schuler and Webster, 2001).

The directions of interventions in both pivotal abilities development and strengthening of the learning process consider relevant some specific strategies which can increase the child's motivation of involving in such attentional behaviors: the presence of the adult as strengthening (Bakeman and Adamson, 1984, 1986), using natural consequences (functionally related to the given task – Williams and Egel, 1981), alternating the activities (easy – difficult, structured – non structured, compulsory – optional – Koegel et al., 1999; Dunlap 1984) and using the child's preferences/choices (objects or activities previously identified as having the role of a reward for the child will be used – Bruner and Sherwood, 1983;Warren et al., 1993).

Purpose of the study: our objective was to initiate a functional investigation of joint attention ability and to assess the efficiency of an individualized intervention program with the purpose of developing this ability in three autistic and severely mentally disabled children. Our purpose was to make an intervention in joint attention, approaching it on stages and holistically in the same time, taking into consideration the forms and the functions contained in this concept. Therefore, consolidating the primordial joint attention function – the social motivation – is a priority.

Method:

Participants: three children with autism (no older than 5 years) living in Cluj County, cases which live in orphanages or within a family.

Measures and materials: Experimental design with one subject with a multiple base level within the subjects. Two experimental conditions are presented (starting level and intervention I and II) monitoring the changes in the four target behaviors: reaction when showed an object, ability to follow the experimenter's gaze or pointing, coordinating the alternation of gaze and protodeclarative gestures.

Procedure:

A complex evaluation of the participants was performed. We started with a global, functional evaluation of autism (as they already had the psychiatric diagnostic of autism set by the specialized commission within the General Direction for Child Protection Cluj), collecting as much information as possible. Furthermore, a specific evaluation of joint attention ability (Loveland and Landry, 1986), measuring the child's response and initiation of joint attention gestures/behaviors was performed: 30 minutes for each child, involvement in specific activities in an unstructured context. Each child had 10 "opportunities" for joint attention. The responses pursued and rated were the following: (1) response when being shown an object, (2) following the gaze/ pointing, (3) coordination of gaze swinging and (4) protodeclarative pointing. All the sessions were also video recorded for subse-

quent analyses and coding.

For the intervention phase we used the therapeutic protocol developed by Whalen and Schreibman, (2003):

(1) Basic stage: 1 ½ h sessions twice a week, each session being divided in three parts of 25 minutes each with 5 minutes breaks in between. From 5 to 5 minutes the therapist tries to involve the child in specific joint attention behaviors. At this stage, no contingence is offered.
(2) Joint attention Reevaluation stage (Loveland and Landry, 1986)
(3)Intervention I – response to joint attention: six steps, each new step being started after the previous step has been successfully achieved. The step is considered achieved if the success rate of target behaviors reaches 80%. This percentage is considered in the literature of the domain (Whalen and Schriebman, 2003) as the minimum success rate required for passing to the next step (step1: hand response to another object; step2: response to an object that is being tapped by the experimenter in front of the child; step 3: response to a shown object; step 4: eye contact; step 5: following the pointing of the experimenter and step 6: following the experimenter's gaze swinging.
(4) Joint attention Reevaluation stage (Loveland and Landry, 1986)
(5) Intervention II – joint attention initiation: coordination of gaze swinging (behavior which is considered acquired if the success rate is of 30%, without any guidance) and protodeclarative ponting (behavior considered acquired if the child performs pointing without guidance with a success rate of 15%).
(6) Joint attention Reevaluation stage (Loveland and Landry, 1986)
(7) Follow up.

Results:

In order to assess the effects of this therapeutic protocol, an experimental design with multiple base levels was used. The initial global evaluation of the cases did not reveal any specific problem, which would have required priority intervention (auto or hetero-aggressive behaviors, or other associated specific conditions).

In these circumstances it was possible to set up a stage of evaluation focused on joint attention behavior. We are interested in the two dimensions of this pivotal ability: response and initiation of joint attention behavior. These dimensions were operationalized in specific behaviors: response to a shown object and following the experimenter's gaze for the first dimension, and coordination in alternation of gaze and protodeclarative gestures for the second dimension of the joint attention behavior. In all the stages of the evaluation the rate in correct response for these four was pursued.

The specific initial evaluation of the cases revealed the existence of some feeble or atypical responses in joint attention of the children studied. It was noticed that for the first dimension the rate of correct responses was between 25% and

35%, which is very low. For the second dimension of joint attention behavior, the rate of correct response was between 0% and 5%. However, these results suggest that autistic children have some limited abilities, undeveloped elemental joint attention behaviors.

The data obtained at this stage are in agreement with those of the domain literature (Leekam et. al., 2000) that states that children with autism feature a few abilities of response to adult-initiated joint attention without any intervention. The authors cited do not mention, though, whether those children were not subject to any intervention on their disorder or they were not subject to intervention in joint attention. It is possible that this core ability slightly improves, similarly to those abilities that are discovered in the initial stage, subsequent to interventions in other developmental areas in autistic children: formation of skills, imitation, dyad relation (Buggey, 2005; Jones and Schwartz, 2004; Kohler, Anthony, Hayson, 2001; Hancock and Kaiser, 2002).

It must be mentioned that the developmental level of joint attention reported after the initial evaluation is inferior to the one of children with normal development, fact which is in accordance with the studies in the domain (Loveland and Landry, 1986).

There were no significant improvements of these behaviors during the basic stages (improvements were of maximum 5 percent between the initial evaluation and the evaluation after the basic stage), which gives us the right to think that this ability did not improve because the subjects grew up. Equally, the deficit in joint attention initiation persisted, and this dimension did not improve during the basic stages or during the intervention I. Moreover, authors (Mundy, 1990) states that autistic children will never be able to develop the protodeclarative gesture in time, simply by growing up, but only subsequent to sectorial, multidimensional and intensive interventions.

It was noticed that all these children made substantial progress in the dimension – response to joint attention after stage I of the interventional protocol. The first subject featured an increase from 30% to 70%, which means that the rate of his correct responses doubled. The same happens with the other two subjects (for V.A. the success rate increases from 25% to 70%, while F.I.'s success rate increases from35% to 80%).

Furthermore, the scores of the correct answers in the first dimension of joint attention after the intervention are very close to the minimum scores required for success which is stated in the domain literature (80% Loveland and Landry, 1987; Whalen and Schriebman, 2003). Reaching this score, or a close one, actually means that the child is able to use correct behaviors as response to adult-initiated joint attention. In our opinion, these results are the outcome of systematic measures taken in order to develop these abilities. The intervention was made on stages, each stage being started only after the successful accomplishment of the previous. Additionally, an increase in the children's determination and involvement in the activities was given by the fact that the activities which we knew the children cannot perform were alternated with activities they had learned in previous stages.

We also consider that the intervention on the first dimension of joint attention has positive effects on focus and alternating focus of the children in different social contexts.

All three subjects featured severe deficit in coordination of gaze swinging and in protodeclarative behaviors. During the joint attention initial evaluation stage, it was noticed that behaviors pertaining to the second dimension of joint attention were lacking, or were very poor (the first subject has score of 5% while in the other two cases such behaviors were not present). This data is in accordance with the domain research (Mundy et. al., 1990; Whalen and Schreibman, 2003; Charman et. al., 1997). After stage II of the intervention these abilities significantly improve (increase from 5% to 20% for the first case, from 0% to 15% for the second and from 0% to 25% for the third case). We also mention that the rate of correct answers at the post-intervention evaluation is close to the minimum score for success reported in the domain literature.

	Subject 1. M. V.		Subject 2. V. A.		Subject 3. F. I.	
Evaluation phase	JAT Response	Initiating JAT	JAT Response	Initiating JAT	JAT Response	Initiating JAT
Initial evaluation	25%	5%	20%	0%	35%	0%
Post baseline evaluation	30%	5%	25%	5%	35%	0%
Post intervention I evaluation	75%	5%	70%	10%	80%	5%
Post intervention II evaluation	75%	20%	75%	15%	80%	25%
Follow-up	75%	10%	70%	5%	75%	30%

Table 1. Correct answers offered by the subjects in the evaluation phases (percentages %).

These results are extremely important, given the connection between the ability of initiating joint attention and the further progress in social abilities (Kasari, 2001; Baron-Cohen, 1995), language acquisition and maturation, (Mundy and Gomez, 1998; Mundy and Sigman, 1989) and also pretended play (meaningful play, initiated by the children).

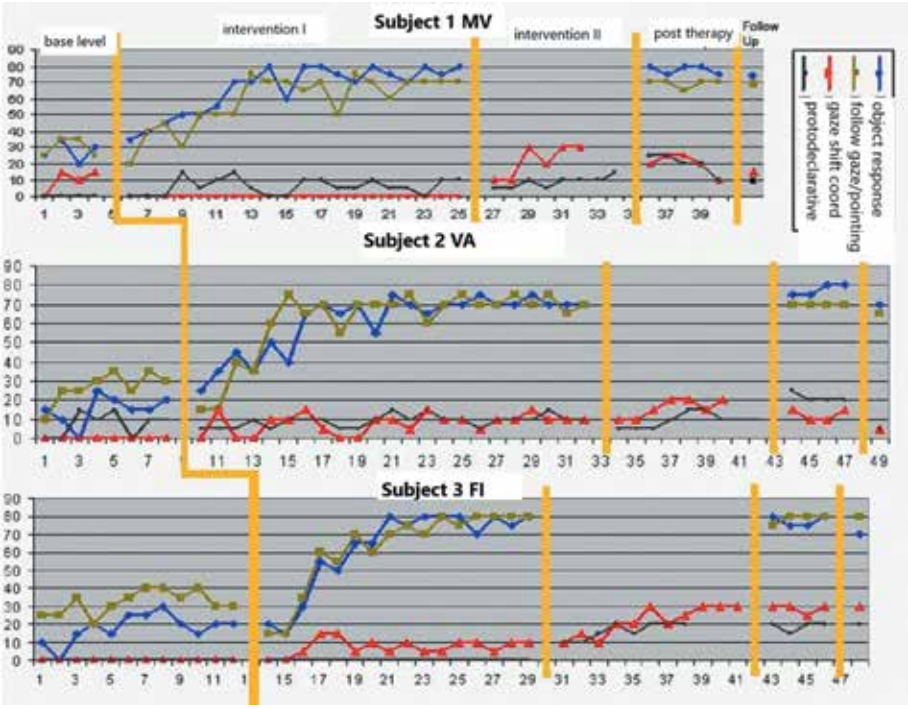

Figure 1. Distribution of the therapy sessions for each subject within the multiple case study

At the evaluation made two months after the end of the intervention it is observed that all the three subjects maintained the acquisitions made in the first dimension of joint attention. The ability of responding to a joint attention behavior initiated by someone else is built, strengthened and the results last. Maintaining the acquisition and generalizing learning was also possible thanks to a set of activities performed within the day care center after the intervention, in which the child was stimulated to respond to joint attention behaviors initiated by the adult. As far as the child- initiated joint attention is concerned, the situation is different. For the first two cases there is a decrease in the rate of correct response to joint attention (from 20% to 10 % for M.V and from 15% to 5% for V.A.). Consequently, for the first two cases the initiation of joint attention behavior has seriously regressed during the two months after the intervention. For the first case, the rate of correct response dropped with 50% since the post-therapy evaluation to the follow-up, while the second case offers now only one third of the number of correct responses, he used to give right after the end of the therapeutic program. As for F.I., at the follow-up, the rate of correct response on this dimension was of 30%. It is not only a preservation of the acquisition after the end of the intervention but also an improvement of this ability.

With good reason, we believe that this is the result of the fact that the third child has a family which pays a lot of attention to him and his problems, his par-

ents being actively involved in continuing the therapeutic approaches initiated in the Complex, daily, after the child comes home. On the other hand, the other two children come from an orphanage where the degree of stimulation and implication in activities, which could have preserved these acquisitions, is much lower than in a family context. For a global image of this research see the summative table 1 and figure 1, posted above.

This study clearly shows that autistic children have the ability to learn how to respond to adult-initiated joint attention and even how to manifest behaviors of initiating joint attention themselves (Coordination of gaze swinging and protodeclarative gestures). In addition, it must be mentioned that these children have undertook, for the first time and successfully, a systematic learning program meant to increase the quality of their lives.

Discussions and conclusions:

Assisting autistic children and their families involves multifactorial measures which calls for a collaboration between specialists (psychologists, doctors, educators) and parents, who are believed to have an indispensable role in the existence and development of their child. We are still facing this enigma called autism, which has many faces, many of them complex and intensively debated upon. The present directions of researches regard the causes of this disorder, its diagnosis as soon as possible and developing intervention programs in accordance to the child's needs. Screening instruments are now being used, following the recommendation of researchers (American Academy of Neurology), as they are good predictors for the examination of different developmental areas.

Behavior acceleration/deceleration techniques (David, Szamoskozi, Holdevici and Băban, 1998) as well as naturalist ways of rewarding and monitoring (reward functionally related to the task – Mundy, 1995; Kasari, Freeman and Paparella, 2001) are reliable tools for developing certain abilities or for decelerating certain disadaptive behaviors.

In the study herein, such techniques are successfully being used in order to develop the joint attention ability, a pivotal ability with multiple implications in other developmental areas which are deficient in autism such as social abilities, language or meaningful play (Jarrold, 2003)

Regarding the response to adult-initiated joint attention, the children feature preservation of the acquisitions after two months from the therapeutic approach (fact which was proved by a follow-up evaluation). As for the ability to initiate joint attention behaviors, the results are maintained, and there is even an improvement of this ability after two months from the intervention. This can be the outcome of parents` involvement in the therapeutic approach and of their manifest interest in their child and his problems. The other two cases feature regress in this dimension and the approaches have to be repeated for a better consolidation of these acquisitions. It may be that this decrease in the rate of correct response is caused by the particular condition of the cases (institutionalized in orphanages)

which made the process of generalizing learning more difficult.

Developing this ability is an extremely important measure, which has an essential effect upon the quality of life of these children and upon the further learning of new abilities and skills. Firstly, it is the first structured learning process on stages, in which these children are involved and which results in the acquisition of a pivotal ability which facilitates the progress in other developmental areas (language, interaction and social understanding). Equally, it has to be mentioned that this intervention is a is a starting point for other learning stages in which the children will be involved, for the assistance process and for the increase in the quality of their lives.

It is also of great importance to analyze the joint attention behavior in the natural environment of the child in order to see which are the circumstances in which this behavior occurs more often as well as to see which are the persons with which the child is inclined to perform joint attention (parents, brothers, teachers, other children his age, etc.). Likewise, this analysis should also be made on children with typical development in order to see which the best context to acquire this behavior is. Once these questions answered to, it will be possible to develop intervention programs outside the laboratory context and these programs will become accessible to parents, educators, therapists and to everybody who interacts with these children.

It is equally important to discover the progression of this core attentional ability as well as to closely study the way in which therapeutic interventions affect the subsequent development of the child.

Bibliography:

Aarons M., Gittens T. (2003). *The Autistic Continuum. An Assessment and Intervention Schedule.* NFER-Nelson Publishing Co Ltd Darville House, 2 Oxford Road, East Windsor, Berkshire SL4 1DF England.

Adamson L. B, Bakeman R., Deckner D, F. (2004). *The development of symbol-infused joint engagement.* Child Development; 75:1–17

Adamson, L. B., Bakeman, R., & Deckner, D. F. (2004). *Patterns of joint attention development after infancy.* In Y. Oyabu, M. Tanaka, & H. Itoh (Eds.), Development and disorder of joint attention. Tokyo: Kawashima-shoten.

Adamson, L. B., McArthur, D., Markov, Y., Dunbar, B., & Bakeman, R. (2001). *Autism and joint attention: young children's responses to maternal bids.* Journal of Applied Developmental Psychology, 22, 439-453.

Adrien JL and others., (1992) *Early symptoms in autism from family home movies. Evaluation and comparison between 1st and 2nd year of life using I.B.S.E. scale.* Acta Paedopsychiatrica 55:71-75.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC

Bailey, A., Phillips, W., Rutter, M. (1996). *Autism: Toward an integration of clinical, genetic, neuropsychological, and neurobiological perspectives.* Journal of Child Psychology and Psychiatry, 37, 89–126.

Bakeman, R. (2006). *The practical importance of findings.* In K. McCartney, M. R. Burchinal, & K. L. Bub (Eds.), *Best Practices in Quantitative Methods for Developmentalists* (pp. 127-145). Monographs of the Society for Research in Child Development, 71(3, Serial No. 285).

Barlow, D. H., and Hersen, M. (1984). *Single Case Experimental Designs. Strategies for Studying Behavior Change.* 2nd. Edition. Boston, MA: Allyon and Bacon.

Baron-Cohen, S., Allen, J., Gillberg, C. (1992). *Can autism be detected at 18 months? The needle, the haystack, and the CHAT.* British Journal of Psychiatry, nr. 161, pag. 839–843.

Barthelemy, C., Adrien, J. L., Tanguay, P., Sauvage, D., Lelord, G. (1990). *The behavioral summarized evaluation: Validity and reliability of a scale for the assessment of autistic behaviors.* Journal of Autism and Developmental Disorders, nr. 20, pag. 189–204.

Bates, E., O'Connell, B., & Shore, C. (1987). *Language and communication in infancy.* In J. Osofsky (Ed.), Handbook of infant development (pp. 149-203). New York: Wiley.

Bechara A., Damasio H., Damasio A., R. (2000). *Emotion, Decision Making and the Orbitofrontal Cortex,* Cerebral Cortex, Volume 10, Issue 3, pages 295–307.

Benga O., (1997). *Modele etiopatogenice în autism.* Creier. Cogniţie. Comportament, vol. 1, nr. 1, pag. 99-124

Ben-Itzchak, E., & Zachor, D. A. (2007). *The effects of intellectual functioning and autism severity on outcome of early behavioral intervention for children with autism.* Research in Developmental Disabilities, 28(3), 287–303.

Bruinsma, Y., Koegel, R., L., Koegel, L., K, (2004). *Joint Attention and Children with Autism: A Review of The Literature,* Mental Retardation and Developmental Disabilities Research Review, 10, pag. 169 – 175.

Butterworth, G. (1991), *The Ontogeny and Phylogeny of Joint Visual Attention,* in A. Whiten, ed., Natural Theories of Mind, Blackwell.

Butterworth, G., & Grover, L. (1990). *Joint visual attention, manual pointing, and preverbal communication in human infancy.* In M. Jeannerod (Ed.), *Attention and performance 13: Motor Representation and control* (pp. 605–624). Hillsdale, NJ: Erlbaum.

Carpenter, M., Nagell, K., & Tomasello, M. (1998). *Social cognition, joint attention, and communicative competence from 9 to 15 months of age.* Monographs of the Society for Research in Child Development, 63 *(4, Serial No. 255).*

Carr, E. G. (1994). *Emerging themes in the functional analysis of problem behavior.* Journal of Applied Behavior Analysis, vol. 27, pag. 393–399.

Carr, E. G., Kemp, D. C. (1989). *Functional equivalence of autistic leading and communicative pointing: Analysis and treatment.* Journal of Autism and Develop-mental Disorders, nr. 19, pag. 561–578.

Charman T, Swettenham J, Baron-Cohen S, Cox A, Baird G, Drew A. (1997) *Infants with autism: an investigation of empathy, pretend play, joint attention, and imitation.* Developmental Psychology.

Corkum, V., & Moore, C. (1995). *Development of joint visual attention in infants. In C. Moore & P. J. Dunham (Eds.), Joint attention: Its origins and role in development* (pp. 61-84). Hillsdale, NJ: Lawrence Erlbaum.

Corkum, V., & Moore, C. (1998). *The origins of joint visual attention in infants.* Developmental Psychology, 34, 28-38.

David D., Szamoskozi Ş., Holdevici I., Băban A. (1998). *Psihoterapie şi hipnoterapie cognitiv-comportamentală. Intervenţie cognitiv-comportamentală în anxietate, tulburări sexuale, psihosomatice şi deficienţă mintală.* Ed. Risoprint, Cluj-Napoca.

Dawson, G., Munson, J., Estes, A., Osterling, J., McPartland, J, Toth, K., Carver, L., Abbot, R., (2002). *Neurocognitive Function and Joint Attention Ability in Young Children with Autism Spectrum Disorder Versus Developmental Delay.* Child Development, vol. 73, nr. 2, pag. 345 – 358.

Dawson, G., Osterling, J. (1997). *Early intervention in autism.* în M. Guralnick, *The effectiveness of early intervention* pag. 307–326. Baltimore: Brookes.

Fasel, I., (2000). J*oint Visual Attention. A Tiny Filament Connecting the Disciplines of Cognitive Science.* UCSD – EDU.

Gratier M., Rozga A. (2004). *Early detection of core deficits in autism.* Mental Retardation and Developmental Disabilities Research Reviews, 10, 221-233

Horner, R. H. (1994). *Functional assessment: Contributions and future directions.* Journal of Applied Behavior Analysis, vol. 27, pag. 401-404

Jarrold C. A (2003). *Review of research into pretend play in autism.* Autism. Dec;7(4):379-90. doi: 10.1177/1362361303007004004.

Jones, E., A., Carr, G., (2004). *Joint Attention in Children with Autism: Theory and Intervention.* Focus on Autism and Other Developmental Disabilities, vol. 19, nr. 1, pag. 13-26.

Kasari, C., Freeman, S., and Paparella, T. (2006). *Joint attention and symbolic play in young children with autism: a randomized controlled intervention study.* Journal of Child Psychology and Psychiatry and allied disciplines, 47(6), pp. 611-620.

Kasari, C., Freeman, S., Mundy, P., & Sigman, M.D. (1995). *Attention regulation by children with Down syndrome: Coordinated joint attention and social referencing looks.* American Journal on Mental Retardation, 100(2), 128-136.

Landa, R. J. (2018). *Efficacy of early interventions for infants and young children with, and at risk for Autism Spectrum Disorders.* International Review of Psychiatry, 30(1), 25–39.

Landry SH, Loveland KA. (1988) *Communication behaviors in autism and developmental language delay.* Journal of Child Psychiatry;29(5):621–634.

Leung E.H.L, Rheingold H.L. (1981). *Development of pointing as a social gesture.* Developmental Psychology, 17 (2), 215–220

Lewy A. & Dawson G. (1992). *Social stimulation and joint attention in young autistic children.* Journal of Abnormal Child Psychology, 20, 555-566

Loveland KA, Landry SH. (1986) J*oint attention and language in autism and developmental language delay.* Journal of Autism and other Developmental Disorders16 (3):335–349.

MacDonald, R., Parry-Cruwys, D., Dupere, S., & Ahearn, W. (2014). *Assessing progress and outcome of early intensive behavioral intervention for toddlers with autism.* Research in Developmental Disabilities, 35(12), 3632–3644

Moore C., Dunham P., (1995), *Joint attention: Its origins and role in development.* Hillsdale, NJ: Erlbaum.

Mundy, P. & Acra, F. (2006). *Joint Attention, Social Engagement and the Development of Social Competence.* In P. Marshall & N. Fox (Eds.) *The Development of Social Engagement Neurobiological Perspectives* (pp. 81-117). New York, NY: Oxford University Press.

Mundy, P. & Burnette, C. (2005). *Joint attention and neurodevelopment.* In F. Volkmar, A.Klin, & R. Paul (Eds.), Handbook of Autism and Pervasive Developmental Disorders, Vol. 3.(pp. 650-681). Hoboken, NJ: John Wiley.

Mundy, P. & Sigman, M. (2006). *Joint attention, social competence and developmental psychopathology.* In D. Cicchetti and D. Cohen (Eds.), Developmental Psychopathology, Second Edition, Volume One: Theory and Methods, Hoboken, N.J.: Wiley.

Mundy, P. (2003). *The Neural Basis of Social Impairments in Autism: The Role of the Dorsal Medial-Frontal Cortex and Anterior Cingulate System.* Journal of Child Psychology & Psychiatry, 44, 793-809.

Mundy, P., Fox, N., Card, J., (2003). *Report: EEG coherence, joint attention and language development in the second year.* Developmental Science 6:1, pag. 48 – 54.

Murza K. A., Schwartz J. A., Hahs-Vaughn D. L., Nye C. (2016). *Joint attention interventions for children with autism spectrum disorder: a systematic review and meta-analysis,* International Journal of Language & Communication Disorders, 10.1111/1460-6984.12212, 51, 3, (236-251).

Schopler, E., Reichler, R., Renner, B. R. (2002). *The childhood autism rating scale.* Los Angeles: Western Psychological Services.

Schwartz, I. S., Boulware, G., McBride, B. J., Sandall, S. R. (2001). *Functional assessment strategies for young children with autism.* Focus on Autism and Other Developmental Disabilities, 16, 222–227.

Sigman, M., Dijamco, A., Gratier, M., Rozga, A., (2004). *Early Detection of Core Deficits in Autism.* Mental Retardation and Developmental Disabilities Research Review, 10, pag. 221 – 233.

Slaughter V, McConnell D. (2003). *Emergence of joint attention: relationships between gaze following, social referencing, imitation, and naming in infancy.* Journal of Genetic Psychology; 164:54–71.

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, pp. 11-29.

Yoder, P.J., Warren, S.F., & Hull, L. (1995). *Predicting children's response to prelinguistic communication intervention.* Journal of Early Intervention, 19(1), 74-84.

Young N., Hudry K., Trembath D., Vivanti G. (2016). *Children With Autism Show Reduced Information Seeking When Learning New Tasks,* American Journal on Intellectual and Developmental Disabilities, 10.1352/1944-7558-121.1.65, 121, 1, (65-73).

Webliography:

https:\\www.ahs.ro