

ABSTRACT OF DOCTORAL THESIS BY MS MARINELA RATA

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Thesis Title: SENSORY-MOTOR STIMULATION – AN OPTIMIZATION SOURCE OF
VERBAL AND NONVERBAL COMMUNICATION IN AUTISTIC CHILDREN'S
CONDITION

Key words: autism, physical therapy, sensory-motor stimulation, paediatric disease

“To be an autistic person doesn't mean to be inhuman ...it means to be different, so that what I consider to be normal isn't the same for other people. As concerns some aspects, I am not very well prepared to be able to survive in this world, like a failed alien, without an orientation handbook... Give me the dignity to know me as I am, admit the fact that we are equally strange each other, that my living attitude is not only a damaged version of yours'. Suspend your own presumptions for a moment. Define your own terms. Help me to built links between us.”(Sinclair J., 1992)¹.

The hereby work was structured in three parts, every of them containing more chapters:

- Part I – it consists of the theoretical, conceptual and methodological substantiation, as concerns autism at the age of 4-10 years, it consists of 6 chapters, which aims to: the theme reflection in specialty materials, the definition of autism, the description of the concept: sensory-motor stimulation, of communication and of psycho-motion;

- Part II – it includes the preliminary research (3 chapters) orientated to the increasing of the autistic child's functional level;

- Part III –it presents the contributions for the communication optimization by sensory-moving methods in autistic children' situation and it consists of conceiving and application of individualized therapy programs (4 chapters). Doctor's degree thesis ends with bibliography and the afferent annexes.

The reason for choosing this theme has come out as a result of the choice of explaining the role and place of physical therapy in this pathologic area, taking into account the possibility of establishing a balance between the sensorial and motor element (both of them are indestructibly connected). One of the most difficult problems of autistic parsons, which influences their social behaviour, communication and which determines stereotypical manifestations, is the sensory-motor dysfunction.

These aspects and especially the wish of achieving a new research, which can complete and offer positive results in autistic children's and their families' lives, stimulated us in choosing this theme. So, I have considered that a research can emphasise the effects of this type of intervention, and the physical therapist will complete the interdisciplinary team by a complex, well-defined and structured approach, with functional applicability. So, we consider that these dysfunctions can be gradually decreased by improving the sensorial-perceptive-motor relations, the autistic child's independence can increase, and communication can be influenced.

Sensory-motor stimulation, considered to be a method, consists of application of some means that produce sensations and perceptions which can be assumed by senses organs in order to get a motor performance.

Our experience with autistic children shows that:

- ✓ Sensorial-motor stimulation is individualised and it is centred on the momentary needs of the child because he/she manifests his/her sensory dysfunction by a specific

¹ Sinclair J., (1992) - Bridging the Gaps: An Inside-Out View of Autism, High-Functioning Individuals with Autism, edited by Eric Schopler and Gary B. Mesibov. Plenum Press, NewYork, 1992.

behaviour. So, the therapeutic approaches can be established on the spot or planned for the next session depending on the resulted performances.

- ✓ The conceived programs proceed from subtle activities and they especially aim to the predictable character and to sensory stimulation gradation, knowing the autistic person's features and reactions which he/she can present mainly in supra-stimulation situation.

Studying the specialty materials, I observed that the works which have been presented nationally are just a few, so the documentation involved the consultation of some bibliographic European (Anglo-Saxon) and American sources.

As a result of its critical analyse and of personal experience, I consider that the approach of autistic child is an original element, especially for the fact that in our country there are some caring centres, which give a selective access.

„We can consider that the sensations are „food for brain” which „produces the information necessary for body and rationality. Sensorial integration starts during the pregnancy period, when the foetal cortex registers the motion of mother's body” Ayres, J. (2007)². Sensory-motor intervention is based on the neuro-physiologic principles which assert the idea that an efficient stimulation will generate facility or inhibition of the nervous system structures, fact that will determine behavioural, relational and communicative modulation in relation with the environment.

Autism is a pervasive development disease which consists of decreasing abilities to interaction socially and to communicate, of the stereotype and repetitive behaviours, but also sensory-motor and mental deficiencies. It is produced by the damage of some structures of the central nervous system that influences the fore-mentioned functions. Autistic symptoms usually appear at about 3 year age and they last all life period.

During the time periods, the researchers identified specific features for *the autistic language*: echolalia, pronouns inversion, excessive literal expressing, metaphoric language, neologisms, confirming by repetition, repetitive questioning, the necessity of scenery repetition, autistic discursive style and the poor control of prosody.

Like any other individual, the autistic person has some necessities and wishes to transmit some messages, but his/her *nonverbal and verbal communication* manner is extremely limited and non-conventional. These are some of the characteristics of nonverbal autistic communication:

- ✓ his/her way of calling one's attention is often reduced to simple shouts or chaotic, aimless gestures;
- ✓ intention is observed sometimes, but the shape of the message misses;
- ✓ the child rarely has a direct look, as a preliminary sign of his/her wish of communication;
- ✓ the posture of the body is frequently fenced in, a little bent, with the head downwards and the touch and direction of the child can determine a rejection reaction;
- ✓ rarely, it happens to ascertain of the eventual partner's reserve;
- ✓ the corporal distance is not the right one, the child being placed too close or too far;
- ✓ he/she has a limited series of facial expressions, often being inexpressive or smiling rarely;
- ✓ lack of feedback can disconcert the collocutor meaning that it is difficult to realise if the interaction is pleasant or not, child's attitude being neutral, apparently disinterested.

² Ayres A. J., (2007) - *Sensory Integration and the Child: 25th Anniversary Edition*, Ed. Western Psychological Services, LA, p 6.

The empirical data of the field researches (Baranek, 1999) and the clinical evaluations (Gillberg and co., 1990) suggest that the features of the models of sensorial and motor behaviour in autism differ qualitatively from those of other developing disorders. More, some unusual sensory-perceptive features appear beginning with the first developing stages (from 9 to 12 months) in autistic children's case.

These sensory-motor responses (as hypo- or hyper-reactions, concern for sensorial features of the objects, perception distortions, paradoxical reactions at sensorial stimuli) has been observed at autistic children in proportion of 42 up to 88%, according to the different works (Kientz and Dunn, 1997; LeCouteur and co., 1998), fact which indicates that these are common aspects.

The preliminary research intended to demonstrate the valences of sensorial-motor stimulation on autistic child, taking into consideration the global functionality of him/her. So, we wished to show the influences of this type of intervention on sensory-motor variables (sensorial profile test), but also the way in which they have a certain impact on the life quality of the autistic child (Portage test).

As a result of studying the specialty materials, of personal experience, taking into account the theoretical substantiation of the hereby pathology, but also of the interventional one, I considered that the preliminary research can start from the fact that *the efficiency of intervention, by sensory-motor stimulation on autistic children, on the basis of a program, structured in accordance with the individual necessities, can influence the functional level of the researched subjects positively.*

The sample which was preliminarily researched consisted of 7 children (5 boys and 2 girls), the intervention beginning in January, 2008. Every child suffered an intervention three times a week, in a session of 30-45 minutes. The intervention programs for autistic children included sensorial and physical environments of work, accordingly structured, which proposed particular models of sensorial processing and offered the possibility to seize the sensorial-motor experiences which aimed to get performances and asserted the functional purposes.

The sensory-motor stimulation rigorously applied, using the game as a principal instrument, contributed to behaviour optimization, by reducing the stereotypes, auto-mutilation and auto-stimulation, by a better perception of the environment, by increasing the concentration and attention abilities, but also the general mobility. The viewed parameters for the assessment of the stimulation effects ameliorated significantly, a fact that was proved by Portage test and by sensorial profile test.

Ameliorative research – Contributions for communication optimization by sensorial – motor method sat autistic children

The purpose of this research had in view the demonstration and correct, constant and continue use of sensorial-motor stimulation, a fact which leads to the bettering of verbal and nonverbal communication of autistic children.

By using this type of intervention, we wished to influence the sensory-motor component, contributing to inadequate behaviour modulation of the autistic person, to child's implication in tasks, improving the communicative capacities too.

The research elaboration viewed the following premises:

- ✓ autism is defined as a developing pervasive disorder and its diagnostic is established after the age of three years and appears as a result of some lesions of central nervous system (limbic system, cerebellum, cortex, basal ganglions) which can manifest before birth (prenatal), during birth (perinatal) or after birth (postnatal);
- ✓ the affectation level is dependent on the lesions size and place; so the autistic persons are divided into two categories: with a high functional level and low functional level, and, in Schopler's opinion, (1995) autism can be severe, moderate and low;

- ✓ autistic basic characters influence the communication, social interaction disorders, and the presence of inadequate, stereotypical behaviours;
- ✓ symptomatology is determined by sensorial-motor dysfunction characterized by difficulties in impulses receiving, modulating and interpreting;
- ✓ sensory-motor stimulation has a more and more important role in the interdisciplinary intervention of disabilities persons, its therapeutic valences being underlined only in international specialty works;
- ✓ the partnership with family is imperative, the therapeutic mission needs interdisciplinary approach, responsibility is divided, the scopes and the objectives being the same as the specialist's.

The formulation of *hypothesis* was based on the deductive judgement and its premises consisted of neuro-biologic and psychological theories as concerns the sensorial modulation and its importance for the communication of the autistic children.

So, I considered that the hereby research can begin with the following hypothesis:

1. *sensorial-motor stimulation of autistic children, by physical exercises programs, structured according to the subjects' needs and applied in accordance with a specific methodology can improve their verbal and nonverbal communication;*
2. *the physical exercise, as a basic mean of physical education and of physical therapy, can ameliorate the sensory-motor and functional level of the autistic child.*

For this work elaboration, *the researching methods* were: documentation, observation, conversation, investigation based on questioner, case investigation, statistical-mathematical method, gathering, interpretation and representation of information.

Evaluation methods were preceded by culling some essential data about subjects, by the observation paper. In order to reflect objectively the results, three tests were applied. Portage test was used to evaluate the functional level, while sensorial profile test was used to evaluate the sensorial-motor part. These two tests are described in the second part of this work. The third test is the one of functional communication profile (PCF-R, edition revised by Kleiman L., 2003), applied in order to estimate the verbal and nonverbal communication of autistic children.

The research developed in University of Bacău, in *Sensorial room* (Laboratory of sensory-motor stimulation), endowed by funds earmarked in the budget of Grant *CNCSIS no. 1231/2007*. The sample that was researched consisted of 7 children (5 boys and two girls), with different functional levels, the same as in the first research.

Establishment of sensory-motor stimulation exercises and *the elaboration of treatment plans* were guided in accordance with integrative sensorial-motor process by Ayres (2007).

The major purpose of sensorial-motor therapy was to stimulate senses, providing a circuit of adequate impulses from receptors to cortex and from cortex to effectors. These integrative aspects are affected at autistic child, underlining the manifestation of specific symptomatology. A better sensorial procession was wished, so that the child to be able to receive, modulate and integrate information in an adequate way, to develop simple adaptative responses, to organise his/her behaviour and to communicate more efficiently.

Sensorial-motor activities (no matter if they are as games or as motor activities) encourages communication between child and collocutor (therapist, parent, nurse), in all of its types. So, the child has the opportunity to interact with a person, to reveal the environment and to have interesting experiences.

By responding to these sensory-motor experiences and by his/her reactions to collocutor's feedback, the autistic child learns to express his/her preferences, needs, to choose something and to communicate in any way, by speaking or by body language.

The process of sensory-motor development was achieved by four integrative levels (Ayres, 2007), based on the tight connection between systems, all of them evaluating gradually, inter-conditioned in order to get superior functionality.

The main strategies which facilitated the process of learning the new abilities were:

- ✓ guiding: verbal (we told the child what we expect from him/her), by gesture (we indicated him/her what to do) and physical (we directed the child using our hands in developing an activity);
- ✓ the connections technique involved the division of the activity in small sequences which could be learn, beginning with the first stage or with the last one;
- ✓ demonstration that consisted of the exemplification of the task or of the final product;
- ✓ gradual diminution of the help according as the child started to learn a new activity.

The individualised programs took into consideration some aspects which derived from analysing the initial assessment and of strict watching of child's evolution and treatment involvement, so:

- ✓ the sessions were directed and proposed by the physical therapist in accordance with the initial sensory-motor evaluation, with the strong and weak integrative sensory points of every child;
- ✓ active participation was encouraged, the exercises make-up being modified sometimes according to the moment mood of the subject;
- ✓ during the first 20 sessions, approximately, simple exercises were done, aiming to an adequate stimuli integration and procession and after this a more complex stimulating form was used – the game, which involved cognitive and communicative compounds.
- ✓ one of the purposes was referring to every session stimulation, to be repeated at home too, in the context of some daily or playing activities, under the watch of the parents, the physical therapist indicating the preferred actions of the child.

Conclusions

1. The physical exercise (Edelson S., 2008, www.autism.org) represents the basic mean of sensorial-motor stimulation and contributes fundamentally to autistic child's neuro-motor development; it facilitate the process of environment exploration, of social and familial relationship, if the application methodology is respected.
2. Verbal and nonverbal communication is based on a sensitive-sensory interaction, especially auditory, visual, vestibular, tactile, proprioceptive. The intervention by sensorial-motor stimulation for the autistic children involves the elaboration of some programs insisting on the physical exercises, structured and seized according to the subjects' needs and aiming to re-gain the sensory harmony. So, the verbal and nonverbal communication level progresses visibly.
3. The physical therapy represents a type of intervention applied in accordance to psycho-pedagogical principles, adding the one of child and aim activities centring. The sensorial-motor program can include active exercises generally, also like games, being able to increase the motor and functional independence level. The individualised programs, the partnership with subject and family can guarantee favourable performances.
4. The involvement of the family, therapeutic partnership, inside of the interdisciplinary team (parent, child, physical therapist, doctor, psychologist) represent a decisive approach during intervention.
5. The precocity of the intervention, the structure, the use of adequate means and strategies in a context closed to the real environment lead to the achievement of the objectives.

6. The therapeutic process is difficult, prolonged (sometimes for a life period), needs sacrifices, perseverance, continuity, tenacity and very much patience, as concerns the interdisciplinary team, but especially parents.
7. The incontestable value of the therapeutic valences of the physical exercise is proved in the hereby work by the results got by applying the three tests, aspects which has been confirmed by the positive score registered and asserted statistically by applying T test, calculation of standard deviation and of numerical values distribution.
8. We can say that the hereby research has an applicative practical value and the intervention programs and the methodological approach are original, as regards both the use of physical exercise and game and the experimental design, according to the interdisciplinary principle.

The research offered me the opportunity to formulate the following *proposals*:

1. The necessity of accomplishing a local centre of consultancy and advising in order to continue, at an ampler level, this type of intervention, notification which is intended to be transmitted to University rector's office and to the town hall.
2. The elaboration and implementation of some projects of parents' formation, in an interdisciplinary context, in order to continue the therapy at home.
3. The elaboration of a guide book of intervention by sensory-motor stimulation which should present strategies and methodologies of physical exercise use. This aspect will increase the capacity of relating between child and parent and it will lead to a bettering of the independence level, implicitly of their life quality.
4. The physical therapist, a component of the interdisciplinary team, needs to be oriented and formed to sensory-motor intervention too, which are based on structured physical exercises, involve the child actively in the recovery session and the finality is a realistic one, essential for the functionality level..

Curriculum vitae

Personal data	
Surname/First name:	RAȚĂ MARINELA
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Professional experience:	
	<ul style="list-style-type: none">• 2009 –university lector, Physical Therapy Department, Faculty of Motion Sciences, Sport and Health, University of Bacău;• 2008 – occupational therapist
Education and evolution:	
	<ul style="list-style-type: none">• 2004 – up to now – doctor’s degree studies in physical education and sport field, National Academy of Physical Education and Sport of Bucharest• 2002-2004 – master courses “Recovery of posttraumatic effects of cutaneous and subcutaneous tissue” Faculty of Physical Education and Sport, physical therapy specialty• 2003 – 2008 – International Post-university Studies by occupational therapy• 1998 – 2002 – University physical therapy courses , Faculty of physical education and sport, Physical Therapy Specialty, physical therapist title. <p><i>Other post-university courses:</i></p> <ul style="list-style-type: none">• 05 – 14. 10. 2009 – course of specialization: Kinesiology of development applied to nurselings, children and adolescents with growth disorders in accordance to doctor V. Vojta, organised by Vojta International Society, part C.• 09 – 20. 03. 2009 – course of specialization: Kinesiology of development applied to nurselings, children and adolescents with growth disorders in accordance to doctor V. Vojta, organised by Vojta International Society, part B.• 22.09 – 3.10. 2008 – course of specialization: Kinesiology of development applied to nurselings, children and adolescents with growth disorders in accordance to doctor V. Vojta, organised by Vojta International Society, part A.• 11-15 of June 2008 – post-university course: Cyriax cervical and thoracic manipulations– achieved by Steven De Coninck, president of ETGOM.• 10-14 of April 2008 post-university course: Cyriax lumbar manipulations– achieved by Steven De Coninck, president of ETGOM.• 14-16 January, 2008 - course of specialization: „The role of sensory integration for autistic child” – achieved by Sensory Integration Network UK, Bournemouth, UK

<i>1. Organising activities:</i>	<ul style="list-style-type: none"> - A program of Socrates students observation, Faculty of Physical Education and Sport, physical therapy department, University of Wroclaw April, 2008, 5 days - 2007 – 2009 –organising students and specialty debating societies - 2007- 2009 - endowing, arrangement and modernization of education places by founding a sensorial room, tests and specialty books purchasing
<i>2. Positions</i>	<ul style="list-style-type: none"> • 2008- member of university image promotion committee; • 2008 – member of physical therapy department of Faculty of Physical Education and Sport Bacău; • 2002-2009 – member of the committee of organising some national and international conferences
<i>3. Membership in scientific associations</i>	<ul style="list-style-type: none"> • Member of The Romanian Committee of Sport Science starting from 2000 • Member of Romanian Olympic Academy starting from 2002 • Member of Romanian Algesiology Association starting from 2005 • Member of European College of Sport Science starting from 2007 • Member of Sensory Integration Network starting from 2007
<i>4. Abilities and competences for research and didactic process</i>	<ol style="list-style-type: none"> 1. Participation to the elaboration of 2 researching reports in he grant: Researching work about functional level increase at autistic child, by using the physical exercise as a mean of sensorial-motor stimulation, no.1231, 2007-2009 2. March 2007 – winning the first prize at „Young Doctor’s Undergraduate Olympiad”, Pitești 3. 35 works published in the volumes or specialty magazines of National and International Conferences and Sessions between 2001 – 2008 4. Member of the Researching Project: „Curricular Projection Models for Adapted and Inclusive Physical Education”, no. 931, ANEFS, București 5. Member of The Researching Project: „ Researching work about functional level increase at autistic child, by using the physical exercise as a mean of sensorial-motor stimulation”, no. 1231, FEFS, Bacău 6. Member of The Researching Project: „Health promotion in older people: developing materials for taking medicine”; Hacepette, School of Nursing, Ankara, Turkey 7. Member of The Researching Project: Facility to participation for young people with disability in an enlarged Europe; Joint Action Programme Socrates/Leonardo da Vinci/ Youth; 113161-JA-1-2003 8. Teaching Session in Faculty of Physical Education and Sport, physical therapy department, University of Wroclaw, Poland, May, 2008