

A brief review of treatments of children diagnosed with autism

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RIASSUNTO

Dopo una breve introduzione su alcuni punti critici di una diagnosi di tipo strutturale ed aver evidenziato alcuni elementi eziologici, viene presentata una sintetica review dei trattamenti disponibili per il Disturbo autistico. Nel discutere gli interventi più diffusi viene indicata l'evidenza di efficacia. Allo stato attuale i migliori interventi sono di tipo psicoeducativo e comportamentali ABA based.

INTRODUCTION

SAutism was identified in 1943 by the psychiatrist, Dr. Leo Kanner, but it was not until 1980 that autism was diagnostically classified (when the DSM – III was published). The DSM-II only considered the diagnosis of childhood schizophrenia, suggesting that autism was an early stage of schizophrenia in adulthood. In reality, autism is quite different from schizophrenia that starts during childhood (Frith, 1989). For instance, children with autism show no signs of delirium, nor of hallucination, and only in autism is there a numerical difference between male and female (autism is about four times more likely to affect males than females). In addition, autism starts at an earlier stage, and is often associated with mental retardation (in about 80% of the cases), and epilepsy.

There is a lot of criticism of the method of diagnosis based on the DSM IV. On the whole, the major criticism is placed on the classification, as by classifying parts of the information are inevitably lost. The reliability and validity of these categories of diagnosis have also been criticized. The most recent reports in the handbook on diagnosis, however, are more descriptive than the previous ones, and, consequently, these diagnoses with more empirical foundation are considered to be more reliable, even though for some diagnostic categories the reliability might still not be acceptable. As for the validity, especially predictive validity, on the contrary, is still to be considered an open question (Davison & Neale, 2000).

There is criticism regarding the etiquette of Pervasive Developmental Disorders since it is considered to be scarcely informative, difficult to understand, and an element likely

to cause confusion, especially for the parents of children with autism (Rimland, 1993). Despite the current need to identify such a state with descriptive terms, there is still criticism about the term “pervasive” as autism is a very particular type of disorder with very distinct deficits. The statistical analysis of the information taken from a checklist on the characteristics of precocious development in speech and in behaviour seems to be the quickest way to identify subgroups, rather than the working out of some theories based on speculation and conjectures.

Today the clinical diagnosis of autism is considered to be one of the most reliable in the field of psychiatry or development. This, however might not be true in clinical settings in that the diagnoses does not appear to be similar in the two fields – experimental and clinical -.

For the psychological treatment, what seems to be far more important than the diagnosis is the functional analysis of the behaviour that helps to identify the strong and weaker points in each individual and therefore to set up a program of intervention focused on the single person.

ETIOLOGICAL ASPECTS

One of the more well-known, but no longer valid, psychological theories on the etiology of autism came from Bettelheim (1967). This theory is based on the assumption that parents would reject their child, and the child, perceiving these negative parental feelings at an early stage, believes that he/she cannot do anything in order to break this indifference – of a mother with a cold personality, and of an absent father – and consequently of the whole world around him/her. So he/she builds an “empty fortress” of autism in order to defend himself. The precipitating factor leading to autism would be therefore the desire of the parent not to have this child.

Other Freudian analysts, as well as scientists and psychiatrists, followed Bettelheim’s theory of the mother being the cause for autism. Among these there are Harry Harlow, probably after his researches on the effects of maternal deprivation in monkeys, and

Nikolaas Tinbergen, who won the Nobel Prize in medicine in 1973, for his studies on the behaviour of birds.

However, the opposite also has been stated as the cause of autism: rather than a cold mother, a too warm-hearted mother could be the cause of autism. That is, a mother who loves too much, who is too present, who feeds the child even before the actual need, or gives him a toy before he actually wants it. As the needs of the child would be excessively anticipated, the child, as a consequence, would not develop, but remain always a child.

In each of the above cases, the opposing viewpoints had certainly an undesired effect, blaming the parents, who were given an emotionally heavy responsibility. In essence, autism was attributed to a distorted mother-child relationship, to be seen more probably as a difficulty coming from the pathology of the child, a very important element in the settling of autism. In the 1990s, however, Frances Tustin, an English psychoanalyst, apologised for the mistaken etiological analysis, and for the anxieties caused to parents (cit. in Borelli, Magnone, Muzio, Pilone, Repetti & Valceschini, 2001, p.94).

To be correct, it should be pointed out that, according to the etiology of autism, parents played an important part also in the behavioural area. Ferster (1961) maintained that parents of children with autism, being unable to take up the normal function of social reinforcement, in that they pay little attention to the child, are not able to control his behaviour, and, as a result, autism is the outcome. Nevertheless, there are many researches (Cox, Rutter, Newman & Bartak, 1975; Cantwell, Baker & Rutter, 1978) that have not identified any unusual characteristics in the behaviour of parents with autistic children, just as it was impossible to prove that the cause of the severe autistic symptoms was the emotional negligence on behalf of the parents.

Recently, the importance of the neurobiological factors have been reconsidered in the etiology of autism, starting from a series of observations (Bailey et al., 1995; Piven et al., 1995; Courchesne et al., 1988); among these are:

- early onset of autism;

- studies on families and twins that indicate the genetic influence in autism;
- the presence of mental retardation, cerebral abnormalities found in people with autism, symptoms similar to autism that can occur after a disease such as meningitis or encephalitis prove some form of cerebral compromise.

Furthermore, even a genetic predisposition seems to be possible, even though the specifically genetic indicators have not yet been determined.

THE TREATMENTS FOR THE AUTISTIC DISORDER

The New York State Department of Health Early Intervention Program (1999) has checked and demonstrated the methodological legitimacy of research according to which the treatments for autism are considered effective. Other relevant contributions can be found in Smith (1996) and Green (1996).

Generally speaking, there are some characteristics of treatments that increase the probability of its effectiveness (Ramey & Landesman Ramey, 1988). For example:

- The early start and the length of the treatment.
- The intensity of a treatment (shown for example by the number of home visits in a week, by the number of hours per day or week, etc.).
- The amplitude and the flexibility of a treatment.
- Direct learning experiences on behalf of the child.
- Supports that continue in time.
- Recognising the individual differences in the benefits received during the treatment.

The following section outlines some treatments for autism, describing their main characteristics, and indicating, where possible, their effectiveness.

THE PSYCHOANALYTICAL APPROACH

Bettelheim, (1967,1974) following his etiological theory, believed that it was necessary to re-establish a warm and loving atmosphere inside the family, as well as the

capacity for unconditional acceptance, so as to allow the child to be trusting towards establishing relationships. It is as if there were a normal child inside an autistic shell waiting to get out. The metaphor of a “child wound in a ball” has been suggested in several cases, according to which by being accepted the “ball” would with time unwind itself, bringing out the qualities of the child (Caracciolo, 1988, p.55). Recent studies (Pollak, 1977) have questioned the validity of Bettelheim’s statements about the procedures used, and the positive results obtained; moreover, the fact that it is impossible to check the effectiveness of this treatment, does not allow verification of its legitimacy, whether true or not. The psychotherapeutic interventions have been shown to be ineffective, whereas the models of educational and behavioural intervention have proved to be the methods with the best documentation on their effectiveness (Gilberg, 1995).

- There are Developmental Approaches such as:

DIR (Developmental Individual-Difference, Relationship-Based), a model also known as ‘Floortime’ approach (Greenspan, 1992a, 1992b; Greenspan & Wieder, 1997).

This intervention focuses on emotional and communicative development, rather than cognitive development: the therapist tries to place the child in an interactive context, without focusing on particular areas of competence. The idea is to re-establish a developmental sequence, starting from the stage where the child is supporting his spontaneity, motivation, emotional expression, etc., in an open game without any structured interactions.

The most important results seem to relate to the parents of these children, who learn to interact with their child in a more relaxed way, even though the stated aim is directed to the ability of the child to relate to others in a pleasing and empathetic way, thus developing the ability to be emotionally flexible. It is an intervention based on the theory that the relational problems, and those of emotional

interactions, are linked to difficulties underlying the processing, perhaps having a biological basis. So this type of intervention is thought to allow the developmental skills to surface, based on the belief that emotional interaction is capable of sustaining emotional and cognitive growth.

There is insufficient research to support the effectiveness of this treatment for children with autism, even though some aspects of this intervention are coherent, with elements of interventions that have proved to be effective.

TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children).

This can be considered as a developmental approach, since differences are seen in the development within and between children (cf. Reichler & Schopler, 1976). The ultimate objective is to find the right strategies to help the person during his whole life. These aims are based on patterns of individual development, and include both the child and his family: furthermore, particular attention is given to the presence of a place where learning can occur according to the needs of the child's impairment (individualization). The strongest aspects of this treatment are the direct relationship between assessment and planning of the intervention, as well as the continuous participation of the parents. This incorporates the results from research from different fields of study, and, from this point of view, it can be considered as an eclectic approach. The major evidence for its effectiveness comes from a survey conducted with the parents of children with autism, in which they had to report how satisfied they were with this treatment (Dawson & Osterling, 1977).

- A field in which the method of intervention for children with autism is widely documented is the one dealing with behavioural treatments. These are the only programs with ample documentation to support their effectiveness. The function operated by the problematic autistic behaviour lies at the centre of the behavioural approaches. The analysis of

the given problem is based on finding out whether there is a particular influence of the environmental events on the behaviour of the person within a given context. The assessment, consequently, consists of describing, in an analytical way, the relationship between the environmental events and the autistic behaviour (Catania, 1992). Thus, the behavioural differences in different contexts can be identified through various strategies, since it is the variability of the behaviour that allows us to point out the environmental factors and their functional characteristics (Wayne County RESA, 1999). The assessment is "idiographic", in that it does not refer to standards, but, on the contrary, the procedure requires the use of the individual's baseline behaviour as the starting point, in order to test the subsequent changes resulting from the intervention. This implies various and repeated testing before, during, and after the treatment. This procedure is the basis for testing also the effectiveness of the treatment, normally done within a single subject design (Truzoli & Hurle, 2000; Fortin & Robert, 1989), but also within complex experimental designs (Truzoli & Sordino, 1999).

BEHAVIOURAL INTERVENTIONS

An important researcher is Lovaas (1977; 1987; 1993; 1996) who, based on his studies of Behaviour Modification, has produced important results, including long-term results (McEachin, Smith & Lovaas, 1993), which document the increase of IQ following treatment reaching the level of normality, development of cognitive and intellectual functioning, and the development of social and adaptive skills. Following his work, other methods of intervention were developed, in which it is possible to notice some common features: a) parent training, b) control of the validity and quality of the intervention, c) verification of the effectiveness of the techniques used, d) referring to the functional approach, e) individualization of the intervention. The

differences, on the contrary, refer to the intensity of the methods used, and whether the intervention is conducted in a natural environment.

The intensive programs of behavioural interventions are based on the widely documented principles of behaviour and learning, they require a continuous monitoring of the behaviour, they can be applied in a vast range of settings by professionals and other semi-professional staff, besides parents. Nevertheless, a professionally trained team is required, as well as a team for coordination and supervision. These have been proved to be valid for the various categories of Pervasive Developmental Disorders (Harris & Handleman, 1994). Normally, the strategies and techniques of Behaviour Analysis are used, such as modelling, prompting, shaping, fading, task analysis, differentiated reinforcements, and equivalence classes (Hernandez & Echegaray, 2001), which are effective in various fields, considering the fundamental impairments of the autistic disorder: social interactions, communication and autistic behaviour.

Parent training is a very important component in such intervention programs, in that the participation of parents allows improvement in many skills, and produce a better interaction with the autistic child; some types of parent training can even reduce stress, and there is greater satisfaction on behalf of the parents. Parent training can be used within various paradigms (e.g., Laski, Charlop, & Schreibman, 1988).

In the behavioural field, naturalistic treatments have been created, and some of these have the aim to develop communicative skills. Among these are the Natural Language Paradigm (Koegel, O'Dell & Koegel, 1987), through which communicative skill is pursued in various social contexts, using specific techniques from behaviour analysis. Similarly, Pivotal Response Training (Schreibman & Koegel, 1996) is aimed at supporting motivation and helping to face the problems deriving from overselectivity. It is based on a series of procedures that facilitate the response to multiple and simultaneous characteristics of

a stimulus; instead of concentrating on a singular behaviour, by doing this, more behaviours are indirectly influenced, instead of only one.

Other training programs with promising results are PECS (Picture Exchange Communication System), and FCT (Functional Communication Training). The former (Frost & Bondy, 1994) is used to acquire functional communicative skills, promoting communication and social exchange, in which the child starts the interaction; FCT (Carr & Durand, 1985; Durand & Carr, 1992) is a strategy that identifies alternatives that are functionally equivalent to the autistic behaviours of the child.

INTERVENTIONS BASED ON THE METHODOLOGY OF PRECISION TEACHING

Developed in the 1960's by Lindsley (1972, 1997), Precision Teaching has at least 40 years of empirical testing of its effectiveness (for a detailed illustration of the fundamental characteristics of Precision Teaching, see Truzoli, 2004). In this context it is important to emphasise that starting from the increase or decrease of behavioural frequency (that is, the learning dimension, and not merely a measurement of learning), this instructional technology has proved to be capable of providing the learning strategies needed for children with autism to become independent, as well as approaching normal functioning.

I.M.A.G.IN.E® (Intensive Model for Autism of Generative Instruction Excellence™) is a monitoring system for the person's learning, totally focused on the one who learns, that incorporates Precision Teaching methods. In research conducted at the University of Western Australia, children with autism (between 2 to 12 yrs.) have shown a change in developmental functioning of two years over a period of 40 weeks (with 15 hours Precision Teaching every week). I.M.A.G.IN.E® is also characterized as a generative instruction tool (Johnson & Layn, 1994): one is aware that the child has learned when he shows a skill that has not been directly learned, but that comes from the

combination of pieces of knowledge and sub-skills earlier acquired.

- Among the interventions focused on communicative skills, Facilitated Communication has been heavily criticized.

FACILITATED COMMUNICATION

This intervention requires a “facilitator”, who guides the hand of the child on a keyboard, helping him to write messages. Through this type of intervention, children with autism seem to show unsuspected skills. Critical analysis of such interventions (Perini & Gazzotti, 2005) suggest that communication might come from the “facilitator”, and not from the child (see Delmolino & Romanczyk, 1995, for a review).

A further suggestion would be “sign language”. Learning such a language often is difficult for young children with autism; this could be explained by the levels of apraxia.

ALTERNATIVE-AUGMENTATIVE COMMUNICATION

The aim of this intervention is to retain communicative function in cases with permanent speech impairment. Through reinforcement procedures, informative feedback, prompting, the child is taught to communicate, for example, by using a sequence of images (cfr. Mirenda & Iacono, 1988). Precisely speaking, augmentative communication is any type of communication that increases and supports verbal communication. It can be used with children who cannot speak, or who have a very limited verbal repertoire. There are many tools that can be used: non verbal communication, sign language, computer written communication, and so forth. Keeping a form of alternative communication allows the child to learn behavioural sequences, and helps to control one’s behaviour.

- In many autistic people, sensorial perception can be either hypersensitive or hyposensitive, and can cause perceptual interference (for example, “tinnitus”). Anomalies of cortical sensorial skills have

been identified, which could be the explanation of sensory distortions. The integrational sensorial therapies try to simplify the development of the capacity of the nervous system to process sensorial information in a normal way (King, 1987; Ayers, 1979). Generally, after having considered the particular dysfunction of sensory processing, one proceeds with sensory stimulation (visual, auditive, tactile and so forth). According to some therapists and parents, after the therapy, children with autism are more relaxed and open to interactive exercises, which involve physical contact. In the literature, however, there are no controlled tests, but, even if it cannot be considered as a primary treatment, it can be used together with other interventions.

AUDITORY INTEGRATION TRAINING

This type of training consists in listening to processed music, with frequencies filtered according to subjective response to an audiogram. In a controlled research, both the experimental group and the control group (placebo) have shown similar behavioural improvements (Bettison, 1996). By examining 28 reports, Edelson & Rimland (2001) found the majority to show some indication of improvement in the capacity for attention and of learning. Yet, all the same, the authors point out methodological weaknesses in all the reports, and underline the necessity of developing specific diagnostic tools, to operate follow-ups, and to improve the description of the procedure used to allow the work to be replicated.

THERAPIES THAT INVOLVE STRUCTURED PHYSICAL ACTIVITIES (RHYTHM, CORPORAL AWARENESS, SWIMMING)

In this last case, the therapies seem to offer gratifying and healthy physical activity, with possible effects on socialization (Kraft, 1983)

THE TOUCH THERAPY

This is a type of massage that requires particular sequences to be performed with moderate pressure and delicate strokes. In a controlled study, no differences were noticed among the groups regarding their aversion to physical contact. Some small signs of improvement were noticed, as their stereotyped behaviour, and reaction to irrelevant sounds, were reduced. (Field et al., 1977).

THE OCCUPATIONAL THERAPY

It focuses on developing fine-motor abilities, and sensory-motor abilities, including balance, awareness of body positioning, and touch. It can be used together with other interventions.

OTHER TECHNIQUES

Some techniques use a swing. By swinging the child on a swing, in various ways, it helps to normalize the vestibular senses. In other cases, to help normalize the tactile sense, various textures are rubbed on the skin. Dr. Temple Grandin, (Temple, 2005) has developed a hug machine (Squeeze machine), which provides the individuals with deep pressure, apparently it has a calming effect on the person. In order to normalize one's vision, there are glasses with prismatic lenses, and movement exercises.

- There are many other therapies, a total of about 400, and here follows a list of some of them that give an idea of the variety to choose from.

THERAPY INVOLVING MUSIC (MUSIC THERAPY)

This therapy requires singing, movement and playing some instruments. They do not require any verbal interaction, and music, being by its nature structured, can have some positive consequences in terms of relationship with others, yet it cannot be used as a primary intervention.

THERAPY WITH SOCIAL STORIES

Also known as Social Scripts (cfr. Gray & Garand, 1993). The aim of this therapy is to render social expectations clear, and to give help in social situations to young people with autism, trying to overcome the impairments conceptualized by the "theory of the mind". Stories are created according to the situation, which create problems for a certain type of person, and these are presented, possibly just before the actual event takes place. The suggested improvements have no strong empirical basis.

THE HOLDING THERAPY

The therapy's objective is to enter into contact with the child, and this can be achieved in various ways, among which there is the therapy of comforting and hugging the child for a certain period of time, even if the child shows resistance. This is to try and build close contact, and to express verbally some emotions. During these sessions, parents are taught to remain calm. There are no appropriate indications to its effectiveness.

THE DAILY LIFE THERAPY

Developed by Dr. Kiyo Kithara in Japan, this stresses physical education and the arts. The students take part in the community's work, and later they are ready to enter the world of business.

THE SON-RISE THERAPY

Suggested by Barry Neil and Samahria Kaufman, they claim that this program has cured their autistic son, and is based on anecdotal observations and direct testimonies; there are no purely scientific studies of this program. Barry Neil and Samahria Kaufman have founded the Option Institute and Fellowship at Sheffield, MA; they intervene on the language skills and behaviour of the child and offer training to families.

THE FLEXYX THERAPY

This therapy uses a system that stimulates the cerebral waves.

THE CRANIOSACRAL THERAPY

This consists in manipulating the bones of the skull. There is no evidence for its effectiveness.

CONCLUSION

Even if there is no real cure for autism, its symptoms can be treated. It is very important for the service providers and the families to be well informed in order to be able to choose the most appropriate treatment for the child, a treatment that should be effective, and satisfy expectations.

When taking a decision the most important question should be: "What kind of results considering a particular treatment supported by peer-reviewed studies can we expect from it?"

For the time being, the best psychological intervention seems to be the integration of psychoeducational programs (including language and occupational therapies) with ABA (Applied Behavioral Analysis) interventions.

REFERENCES

- AYERS, A. J., *Sensory integration and the child*. Los Angeles: Western Psychological Association, 1979.
- BAILEY, A., LE COUTEUR, A., GOTTESMAN, I., BOLTON, P., SIMONOFF, E., YUZDA, E., & RUTTER, M., Autism as a strongly genetic disorders: Evidence from a British twin study. *Psychological Medicine*, 1995, 25, 63-77.
- BETTELHEIM, B., *The empty fortress*. New York: Free Press, 1967.
- BETTELHEIM, B., *A home for the heart*. New York: Knopf, 1974.
- BETTISON, S., The long-term effects of auditory training on children with autism. *Journal of Autism and Developmental Disorders*, 1996, 26, 361-74.
- BORELLI, S., MAGNONE, S., MUZIO, C., PILONE, M., REPETTI, D., & VALCESCHINI, S., Esperienze di intervento psicoeducativo nell'autismo infantile presso il "Centro Paolo VI" di Casalnoceto. *A e R - Abilitazione e Riabilitazione*, 2001, Anno X, 1, 91-107.
- CANTWELL, D. P., BAKER, L., & RUTTER, M., Family factors. In M. RUTTER & E. SCHOPLER (Eds.), *Autism: A reappraisal of concepts and treatment*. New York: Plenum, 1978.
- CARACCILO, E., La contrastata genesi delle nuove metodologie per il recupero del ritardo mentale. In E. CARACCILO & F. ROVETTO (eds.), *Handicap Nuove metodologie per il ritardo mentale*. Milano: F. Angeli, 1988.
- CARR, E. G., & DURAND, V. M., reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis*, 1995, 18, 111-26.
- CATANIA, A. C., *Learning*. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1992.
- COURCHESNE, E., YEUNG-COURCHESNE, R., PRESS, G. A., HESSELINK, J. R., & JERNIGAN, T. L., Hypoplasia of cerebellar vermal lobules VI and VII in autism. *New England Journal of Medicine*, 1988, 318, 1349-54.
- COX, A., RUTTER, M., NEWMAN, S., & BARTAK, L., A comparative study of infantile autism and specific developmental language disorders: 2. Parental characteristics. *British Journal of Psychiatry*, 1975, 126, 146-59.
- DAVISON, G. C., & NEALE, J. M., *Psicologia Clinica*. Bologna: Zanichelli, 2000.
- DAWSON, G., & OSTERLING, J., Early intervention in autism. In M. J. GURALNICK (Ed.), *The Effectiveness of Early Intervention* (pp. 307-26), Baltimore, MD: Paul H. Brookes Publishing Co., 1997.
- DELMOLINO L., & ROMANCZYK, R. G., Facilitated communication: A critical review. *The Behavior Therapist*, 1995, 18, 270-300.
- DURAND, V. M., & CARR, E. G. An analysis of maintenance following functional communication training. *Journal of Applied Behavior Analysis*, 1992, 25, 777-94.
- EDELSON, S. M., & RIMLAND, B., The

efficacy of auditory integration training. Summaries and critiques of 28 reports (January, 1993-May, 2001). <http://www.autism.com/ari/aitsummary.html>.

FERSTER, C. B., Positive reinforcement and behavioral deficits of autistic children. *Child Development*, 1961, 32, 437-56.

FIELD, T., LASKO, D., MUNDY, P., HENTELEFF, T., KABAT, S., TALPINS, S., & DOWLING, M., Brief report: Autistic children's attentiveness and responsivity improve after touch therapy. *Journal of Autism and Developmental Disorders*, 1997, 27, 333-38.

FORTIN, A., & ROBERT, M., Piani di ricerca su casi unici. In M. ROBERT (Ed.), *La ricerca scientifica in psicologia*. Roma-Bari, Laterza, 1989.

FRITH, U., *Autism: Explaining the enigma*. Cambridge, MA: Basil Blackwell, 1989.

FROST, L., & BONDY, A., *Picture Exchange Communication System Training Manual*. Cherry Hill, NJ: Pyramid Educational Consultants Inc.

GASCÓN HERNANDEZ, M., & PUCHE ECHEGARAY, A., Equivalence class formation in teaching pre-match concepts to a young with autism. *The Annual Conference EABG London, April 9th & 10th 2001*.

GILBERG, C. Autism and its spectrum disorders. Epidemiology and neurobiology. *Conference paper presented at the Autism Conference, Brisbane, Australia, February, 1995*.

GRAY, C., & GARAND, J., Social stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior*, 1993, 8, 1, 1-10.

GREEN, G., Evaluating Claims About Treatment for Autism. In C. MAURICE, G. GREEN, & S. LUCE (Eds.), *Behavioral interventions for young children with autism* (pp. 29-43). Austin, TX: Pro-Ed Inc., 1996.

GREENSPAN, S. I., *Infancy and early childhood: The practice of clinical assessment and intervention with emotional*

and developmental challenges. Madison, CT: International University Press, 1992a.

GREENSPAN, S. I., Reconsidering the diagnosis and treatment of very young children with autistic spectrum or pervasive developmental disorder. *Zero to Three*, 1992b, 13, 2, 1-9.

GREENSPAN, S. I., & WIEDER, S., Developmental patterns and outcomes in infants and children with disorders in relating and communicating: A chart review of 200 cases of children with autistic spectrum diagnoses. *Journal Of Developmental and Learning Disorders*, 1997, 1, 87-141.

HARRIS, S. L., & HANDLEMAN, J. S. (Eds.), *Preschool Programs for Children with Autism*. Austin, TX: Pro-Ed Inc., 1994.

JOHNSON, K.R. & LAYNG T.V.J. The Morningside Model of Generative Instruction. In R. GARDNER, D.M. SAINATO, J. O. COOPER, T.E. HERON, W.L. HEWARD, J.W. ESHELMAN & T. GROSSI (Eds), *Behaviour Analysis in Education: Focus on Measurably Superior Instruction*. California: Brookes-Cole, 1994.

KING, L. J. A sensory-integrative approach to the education of the autistic child. *Occupational Therapy in Health Care*, 1987, 4, 77-85.

KOEGEL, R. L., O'DELL, M. C., & KOEGEL, L. K., A natural language paradigm for teaching nonverbal autistic children. *Journal of Autism and Developmental Disorders*, 1987, 17, 187-99.

KRAFT, R. E., Physical activity for the autistic child. *Physical Educator*, 1983, 40, 1, 33-7.

LASKI, K. E., CHARLOP, M. H., & SCHREIBMAN, L., Training parents to use the natural language paradigm to increase their autistic children's speech. *Journal of Applied Behavior Analysis*, 1988, 21, 391-400.

LINDSLEY, O.R. From Skinner to Precision Teaching: The child knows best. In J.B. JORDAN & L.S. ROBBINS (Eds.), *Let's try doing something else kind of thing:*

Behavioural principles and the exceptional child. Arlington, VA: Council for Exceptional Children, 1972.

LINDSLEY, O.R. Precise instructional design: Guidelines from Precision Teaching. In C.R. DILLS & A.J. ROMISZOWSKI (Eds), *Instructional Development Paradigms*. NJ: Educational Technology Publications, 1997.

LOVAAS, O. I., *The autistic child: Language development through behavior modification*. New York: Irvington, 1977.

LOVAAS, O. I., Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, 1987, 55, 3-9.

LOVAAS, O. I., The development of a treatment-research project for developmentally disabled and autistic children. *Journal of Applied Behavior Analysis*, 1993, 26, 617-30.

LOVAAS, O. I., The UCLA Young Autism Model of Service Delivery. In C. MAURICE, G. GREEN, & S. LUCE (Eds.), *Behavioral intervention for young children with autism* (pp. 241-48), Austin, TX: Pro-Ed Inc., 1996.

MCEACHIN, J. J., SMITH, T., & LOVAAS, O. I., Long term outcome for children with autism who received early intensive behavioral treatment. *American Journal on Mental Retardation*, 1993, 4, 359-72.

MIRENDA, P., & IACONO, T., Strategies for promoting augmentative and alternative communication in natural contexts with students with autism. *Focus on Autistic Behavior*, 1988, 3, 4.

NEW YORK STATE DEPARTMENT OF HEALTH EARLY INTERVENTION PROGRAM, *Clinical practice guideline: The guideline technical report. Autism/pervasive developmental disorders, Assessment and interventions for young children (Age 0-3 years)*. (Publication N. 4217). Albany, New York: Health Education Service, 1999.

PERINI, S., & GAZZOTTI, R.,

Comunicazione facilitata e procedure di modificazione del comportamento a confronto nella programmazione educativa con un soggetto artistico. Abstracts del XIII Congresso Nazionale AIAMC – IX Congresso Latini Dies, 5-8 maggio, 2005.

PIVEN, J., ARNDT, S., BAILEY, J., HAVERCAMP, S., ANDREASEN, N. C., & PALMER, P., An MRI study of brain size in autism. *American Journal of Psychiatry*, 1995, 152, 1145-49.

POLLAK, R., *The creation of Dr. B*. New York: Simon & Schuster, 1997.

RAMEY, C. T., & LANDESMAN RAMEY, S., Early intervention and early experience. *American Psychologist*, 1998, 53, 109-20.

REICHLER, R. J., & SCHOPLER, E., Developmental therapy: A program model for providing individual service in the community. In E. SCHOPLER, & R. J. REICHLER (Eds.), *Psychopathology and child development: Research and treatment* (pp. 347-72), New York: Plenum, 1976.

RIMLAND, B., Plain talk about PDD and the diagnosis of autism. *Autism Research Review International*, 1993, Vol. 7, 2, Editorial.

SCHREIBMAN, L., & KOEGEL, R. L., Fostering self-management: Parent-delivered pivotal response training for children with autistic disorder. In E. D. HIBBS & P. S. JENSEN (Eds.), *Psychological treatment for child and adolescent disorders: Empirically based strategies for clinical practice* (pp. 525-52). Washington, DC: American Psychological Association, 1996.

SMITH, T. Are other treatments effective? In C. MAURICE, G. GREEN, & S. LUCE (Eds.), *Behavioral interventions for young children with autism* (pp. 45-59). Austin, TX: Pro-Ed Inc.

TEMPLE G. An inside view of autism. <http://www.autism.org/temple/inside.html>. January, 4, 2005.

TRUZOLI, R. Il "Precision Teaching" nei trattamenti comportamentali finalizzati

all'acquisizione di comportamenti fluenti. *Psicoterapia Cognitiva e Comportamentale*, 2004, 10, 1, 37-49.

TRUZOLI, R., & HURLE, M. Disegni di ricerca a soggetto singolo: indicazioni applicative per il counseling scolastico e l'insegnamento. *Studi di Psicologia dell'Educazione*, 2000, 19, 1-2-3, 87-103.

TRUZOLI, R., & SCORDINO, E. Lo sviluppo cognitivo: l'apprendimento del transfert di mediazione implicita in soggetti normali e con ritardo mentale. *Studi di Psicologia dell'Educazione*, 1999, 18, 1-2-3, 15-54.

WAYNE COUNTY RESA (REGIONAL EDUCATIONAL SERVICE AGENCY), *Guidelines for conducting functional assessment and developing behavior intervention plans*. Wayne, MI: Wayne County RESA, 1999.