



# Benefit Of Multimedia Rehabilitation - Academy for The Brain as Intense Brain Stimulation in The Treatment of People with ASD Autism Spectrum Disorder

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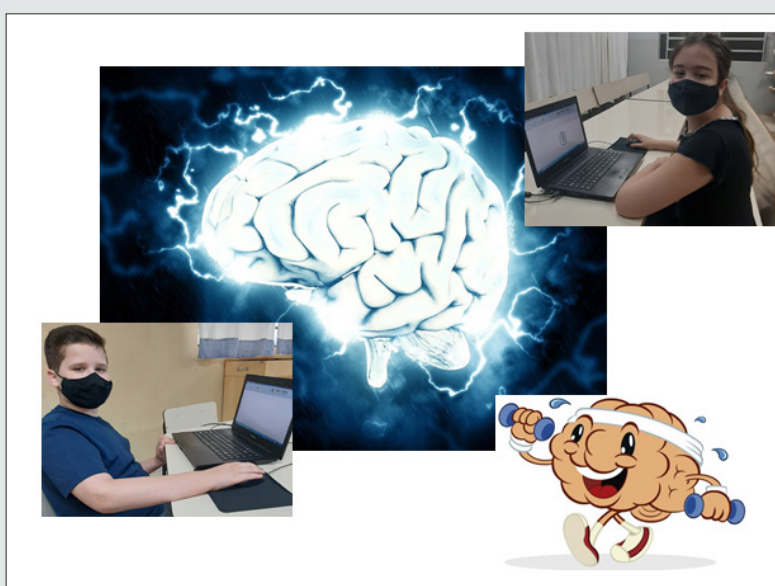
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## Abstract

Autistic Spectrum Disorder (ASD) is a syndrome characterized by problems with socialization, communication, and behavior. This syndrome causes the child to present some specific characteristics most of the time, such as difficulty in communication, speech, difficulty in expressing feelings and ideas, they often feel uncomfortable in the presence of people who do not know them and avoid eye contact, in addition to repetitive patterns and stereotyped movements, such as spending a lot of time rocking your body or an object. However, it is not a rule that everyone has the same repetitive patterns, some children have more than others. We know that our brain can be “reprogrammed” at every moment, creating new synaptic connections and promoting neurogenesis (birth of new neurons, mainly in the hippocampus region). Brain plasticity, or neuroplasticity, is the brain’s ability to recover and restructure. This adaptive capacity of the nervous system allows the brain to recover from disorders or injuries. The Multimedia Rehabilitation technique - Brain Gymnastics - Neurofitness promotes intense brain stimulation, where using the computer it is possible to have all areas of the brain exercised simultaneously. Therefore, this is a technique of great worldwide relevance in the intervention and treatment of people with autism spectrum disorder (ASD), where it is possible to promote great stimulation in all areas of the cerebral cortex simultaneously, bringing neurological maturity in a global way, favoring the developing all areas that occur deficits and awakening new skills and talents.



## Introduction

Autism Spectrum Disorder (ASD) brings together neurological development disorders present from birth or early childhood. They are: Early Childhood Autism, Childhood Autism, Kanner Autism, High Functioning Autism, Atypical Autism, Global Developmental Disorder (PDD) not otherwise specified, Childhood Disintegrative Disorder and Asperger's Syndrome. According to the Diagnostic and Statistical Manual of Mental Disorders DSM-5 (world reference for diagnostic criteria), people within the spectrum may have deficits in social communication or social interaction (such as verbal or non-verbal languages and socio-emotional reciprocity) and restricted patterns and repetitive behavior, such as continuous movements, fixed interests, and hypo or hypersensitivity to sensory stimuli. All patients with autism share these difficulties, but each will be affected to different degrees, resulting in very particular situations. Despite still being called infantile autism, because the diagnosis is common in children and

even babies, disorders are permanent conditions that accompany the person through all stages of life. Autistic Spectrum Disorder (ASD) is currently classified into 3 grades: mild autism, moderate autism, severe autism.

ASD affects the individual's behavior, and the first signs can be noticed in babies a few months old. In general, a child on the autistic spectrum has the following symptoms:

- Difficulty interacting socially, such as maintaining eye contact, facial expression, gestures, expressing one's emotions and making friends.
- Difficulty in communication, opting for repetitive use of language and blocks to start and maintain a dialogue.
- Behavioral changes, such as manias, excessive attachment to routines, repetitive actions, intense interest in specific things, difficulty in imagination and sensory sensitivity (hyper or hypo).

There is still a lot to be unveiled about the brain and ASD, but research carried out with neuroimaging, such as functional magnetic resonance imaging (fMRI), show that there is a low functional connectivity of neurons in ASD, which can trigger changes in tasks involving the working memory and facial recognition.

Research also indicates that the volume of structures in the right hemisphere, related to language functions and social interaction, is greater than in the left hemisphere when comparing people without and with ASD. Hypoactivation of the left hemisphere compared to the right hemisphere, abnormal synaptic maturation, and mirror neuron dysfunction are also cited as possible causes and pathophysiology of ASD (Amatachaya et al., 2015). Regarding learning, we can say that currently, with the growing number of special children enrolled in regular education, there is growing concern about the learning of these students and how interventions and adaptations can be made in the curriculum so that they can meet this diversity of children and participate inclusion in the classroom. However, many challenges are found in teaching so that there is

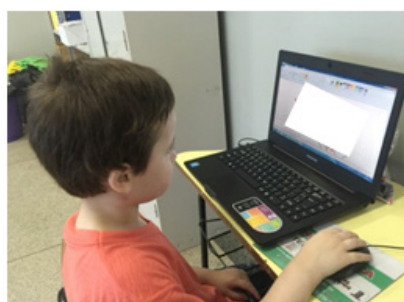
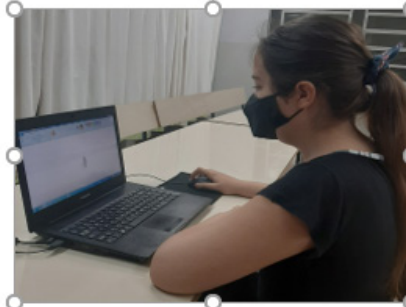
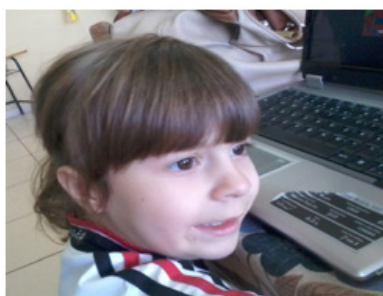
an advance in the learning of these children, especially autistic students, which is the focus of this study. The learning of autistic students is surrounded by many challenges for parents, teachers and professionals involved in this process, as they understand that personalized strategies need to be designed for each child, according to their reality and experience, in order to value their potential and enable the acquisition of new knowledge, social integration and development of new skills. To enhance this learning in a specialized way, Multimedia Rehabilitation - Brain Gymnastics - Neurofitness seeks to contribute through interventions in the learning process in a therapeutic way, to improve the cognitive, linguistic, and social aspects of children with special needs. Based on this, the question is: How Multimedia Rehabilitation - Brain Gymnastics - Neurofitness can contribute to the progress of the student with autism (ASD)?

We know that through neuroplasticity we can "reprogram" our brain, creating new synaptic connections. Brain plasticity, or neuroplasticity, is the brain's ability to recover and restructure. This adaptive capacity of the nervous system allows the brain to recover from disturbance or injury. The Multimedia Rehabilitation technique - Brain Gymnastics promotes intense brain stimulation, where using the computer it is possible to have all areas of the brain exercised simultaneously. If in autistic people there are failures in synaptic connections, through brain stimuli it is possible to intensely increase neural connections, causing new routes to be created so that there is neurological development, where the individual can learn and develop new skills and talents. The activities are carried out using the conventional mouse, where programmed activities are directed to everyone, respecting, and obeying their degree of difficulty, but with each overcoming it is necessary to launch an even greater challenge, as the brain needs to be challenged with each instant. We must get him out of his "comfort zone", proposing dynamic, challenging, and creative activities. The results observed in people with ASD who were submitted to the Multimedia Rehabilitation brain stimulation treatment were of great relevance, where a total of 10 children and 10 adults with ASD participated in the consultations. All underwent consultations during a period of at least one year, noting relevant improvement in general in neurological development and maturation. They showed improvement in speech development, where four-year-old children did not speak at all and after one to two months of treatment through Multimedia Rehabilitation care, they began to "babble" the first syllables, it was possible to notice that the brain was being "unlocked" and thereafter, every week they presented better speech development. Each week they were able to speak better, getting a wider, richer vocabulary, thus facilitating their communication. Relevant improvements in attention, concentration, reasoning, improvement in observation and performance of the developed activities were also observed. The level of understanding and obedience improved a lot in all participants, being possible to notice significant and relevant advances in behavior, socialization, communication, and affectivity.

- The examples below are from the application of the Multimedia Rehabilitation Project - Brain Gymnastics - Neurofitness in

Municipal Schools that take place in the municipality of Olímpia Tourist Resort – SP / Brazil, where it began in the management

of the municipal government in 2010 and due the results of great relevance remained until the current administration.



Images of children with ASD (Autistic Spectrum Disorder) followed up with Multimedia Rehabilitation from the age of 3 to the present time. We can see two examples of children with Autism (ASD) who participate in Multimedia Rehabilitation services from the age of 3 to the present. They developed autonomy, security, self-esteem, orality, reasoning, language, socialization, and a lot of happiness during the activities. We note the pride with which these children carry out the activities, feeling capable of creating, transforming, and expressing their skills and talents. Advances are also perceived by the family in daily activities, where they

report greater security, autonomy, resilience, and new discoveries. "It is important to emphasize that despite the difficulties faced by people with ASD, they have a very rich and dynamic brain, waiting for challenges that make them grow." It is necessary to insist, encourage, challenge skills suggesting increasingly complex activities and especially believe in the capacity that each one has and be willing to show them how much they are capable of being better each day.

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