Chapter #29

THE FUNCTIONALITY PROFILE OF CHILDREN WITH AUTISTIC SPECTRUM DISORDERS (ASD) IN THE AZORES – COMMUNICATION, LEARNING AND AUTONOMY

Tânia Botelho[1], Ana Matos[1], Pilar Mota[1], Bárbara Romão[1], Suzana N. Caldeira[2], Isabel E. Rego[3], Osvaldo Silva[2], & Áurea Sousa[4]
[1]Centro de Desenvolvimento Infanto-Juvenil dos Açores, Portugal
[2]Universidade dos Açores, CICS.UAc/CICS.NOVA.UAc, Portugal
[3]Universidade dos Açores, IVAR, Portugal
[4]Universidade dos Açores, CEEAplA, Portugal

ABSTRACT
Autism is a disorder of the neuro-development characterized by persistent difficulties in communication, cognitive processes, social interaction and also by restrict interests and repetitive and stereotyped behaviours. Regarding to the vision of Universal Design for Learning (UDL), the educational approach should enhance not only the academic acquisitions but also the prognosis of the evolution of the clinical condition and of the functionality of children with Autistic Spectrum Disorders (ASD). Thus, it was considered important to know the perspective of educators / teachers and parents / guardians for the 121 children with ASD who participated in this study.
These children, aged 3-11 years old, live in the Azores (ARA) and are enrolled in kindergarten and in primary schools. Data were collected with a questionnaire (educators/teachers) and in an interview (parents/caretakers). Results suggest that there are different perspectives between the two groups, with educators/teachers viewing the functionality profile of these children as being more aggravated. These differences are statistically significant, especially in terms of the functionalities assessed by the items of communication and learning. The analysis of these different perspectives evidences the importance of the communication between these educational providers regarding the work developed by them.

Keywords: autism, functionality, family, school, universal design for learning.

1. INTRODUCTION

1.1. Autism spectrum disorder

According to the American Psychiatric Association, Autism Spectrum Disorder (ASD) have as their etiology a central nervous system disorder whose manifestations affect a child's normative development. These symptoms may appear during the first 3 years of life, affecting interpersonal communication, social interaction, and interests, causing repetitive behavior and, therefore, impairing the daily functioning of children (APA, 2013).

In regard to the worldwide prevalence of this pathology, it is estimated that it is at least 1.5% in developed countries, with recent increases, especially in cases where there is no associated intellectual deficit (Lyall et al., 2017). Studies related to the epidemiological profile of the ASD, such as Reis, Neder, Moraes and Oliveira (2019), report a higher frequency of diagnoses in males (77%), compared to females. Regarding the age group, there was a greater occurrence in the 5-8 years (44%), followed by the 9-12 years (29%),

13-16 years (15%), 1-4 years (11 %) and between 17-20 years (1%). As for education, most of these children attended primary (49%) and pre-school (33%) education. In 18% of the cases, they did not attend school.

This clinical dysfunctionality is mainly reflected in resistance to common teaching methods and changes in routine. It may also involve cognitive impairment, changes in sleep patterns, difficulties in establishing eye and physical contact with others, difficulties in playing symbolic and "make-believe" games, fascination or obsession with specific subjects, hyper or hypersensitivity to auditory, visual and tactile stimuli, intense motor activity, among others (Lobo, 1998). To recognize all these characteristics is also to understand that children with ASD need differentiated educational responses and that providing the necessary support simultaneously promotes the acquisition of learning and optimizes communication and socialization skills (Pereira, 2008). In 2001, the World Health Organization made it possible to understand the ASD through a biopsychosocial and integrated model of human functionality and disability - the International Classification of Functioning, Disability and Health - Children and Youth (ICF-CY). This Classification served the purpose of standardizing the language on the subject and allowed educational, health, and rehabilitation professionals to describe the functionality profiles of children up to 18 years of age by assessing development and behavior in dimensions such as communication, learning, and autonomy (CPDEC, n.d).

1.2. Communication, learning and autonomy in autism spectrum disorder

ASD is usually diagnosed during early childhood and is characterized by a triad of symptoms that includes the presence of a compromise in the quality of social interactions associated with the existence of deficits in interpersonal relationships, a delay in the development of communication and, furthermore, the presence of restrictive interests and / or repetitive movements (body stereotypes) (APA, 2013; Who, 1993). In addition to these characteristics designated by essential criteria for the diagnosis of ASD, these individuals can frequently present significant comorbidities such as: intellectual deficits (Matson & Shoemaker, 2009; Matson et al., (1996), psychiatric conditions (White, Oswald, Ollendick & Scahill, 2009), delay or atypical development of motor behaviors (Green et al., 2008) and difficulties related to the abilities to imagine. It is common to see that these symptoms persist throughout life, vary and influence, in the long run, the individual's development potential and independence (Sigafoos, Roberts-Pennell & Graves, 1999).

Research unanimously refers to changes in communication and language as the main factors of ASD and as having a strong impact on the quality of these individuals' social interaction and behavior (Fernandes, 1994). This communication deficit also reflects a severity spectrum that can range from the total absence of communication to fluent language (Oliveira, 2005). However, what characterizes the communication profile of individuals with ASD, even the high functioning ones, is the existence of deficits in the level of social pragmatics and in the comprehension of language as a whole. The delay in the development of expressive language, and even its absence, is one of the main reasons for clinical referral.

The learning profile of children with ASD is related to the various cognitive abilities that these children may have, ranging from deep mental disability to higher intelligence (Abreu, 2013). Children with ASD may be more frequently impaired in four specific areas of cognition: imitation, social interaction, play and skills, and ability to develop "theory of mind" skills (Brown & Whiten, 2000). According to Ortiz (2005), ASD children have cognitive rigidity. Given this characteristic, and in order to facilitate learning processes,

these children benefit from learning based on concrete and contextual stimuli (Mota, 2008). The resistance to change and new learning also has its origin in the children's limited imaginative capacity and symbolic play, what can have negative repercussions on their development of conceptual structures and in the ability of solving problems of a symbolic nature, such as calculus, reading and writing (Hewitt, 2006)

Autonomy is a process that begins in the early years of the individual's life and develops throughout life (Silva, 2015). This ability for an individual's personal, domestic and social performance is one of the most important achievements in attaining their social independence. Thus, it is essential to evaluate the adaptive behavior that characterizes this domain of the personal development of children with ASD (Oliveira, 2005). According to Oliveira (2005), results from the application of the Griffiths Mental Development Scale in children with ASD show low rates in the areas of language and practical reasoning and higher rates in the areas of achievement, global motor skills and social staff (autonomy). However, individuals with ASD have a significantly lower environmental adaptive capacity when compared with groups of other individuals without ASD (Oliveira, 2005).

1.3. The contribution of the universal design for learning (UDL) in the learning of students with autism

Universal Design for Learning (UDL), developed by the Center for Special Applied Technology (CAST), takes a contemporary stance in the development of innovative approaches, with the aim of creating universal access to educational curricula for all students, including students with disabilities. This methodology adopts the purpose that all school environments reduce the barriers that hinder the learning of the curricular plan. To this end, the DUA methodology advocates the exercise of flexible teaching approaches and the teaching of meaningful learning to students (Meyer, Rose, & Gordon, 2014).

Meyer et al. (2014), CAST co-founders, assume that there is no single way of learning. The theoretical framework of DUA presents some guidelines for the development of curricula, which include: (a) multiple means of representing content in order to allow students to acquire knowledge; (b) multiple means of action and expression so that students can demonstrate their knowledge, the learning achievements and (c) multiple means of participation and involvement, considering their interests and motivations, in presenting new challenges in their curriculum (Denning & Moody, 2013).

This methodology has been recognized as an asset in supporting the inclusion of students with special educational needs, such as students with ASD. Denning and Moody (2013) report that the principles of the UDL methodology are very valid responses in adapting the classroom environment, as these students may find it difficult to maintain attention, filter out unnecessary information and the ability to change the attentional focus. Another concern to address concerns the need to adapt the presentation of content considering the limitations that these students may feel at the level of information processing or even regarding the requirement for cognitive flexibility (Goldstein, Johnson & Mineshew, 2001). The concept of self-involvement, considered of great importance in the UDL, is also one of the main objectives to consider when including a student with ASD in the classroom, especially since routines are an important factor for the adequacy of their behavior and for the consolidation of learning (Mancil & Pearl, 2008).

According to Mcleskey and Wldron (2007), effective inclusion fits into the UDL methodology given that, as this theory predicts, support for students with special educational needs in the classroom should be discrete. That is the only way they can feel naturally belonging to a school context. According to these authors, teachers should use supports and teaching methods that are effective for all students.

Ultimately, and from the perspective of Denning and Moody (2013), the application of UDL in pupils with ASD may represent an advance in improving school achievement as this approach promotes understanding, independence and performance of these children. The same authors point out that the principles of UDL include the use of supports for routines and procedures, the preparation / anticipation of material and subjects that can assist in the selection of content that constitutes meaningful learning related to skills and previous knowledge of the students; also the use of visual clues (such as symbols or photos) and other tools that increase the forms of representation, and the use of structured tools for the analysis and expression of content; finally, as a primary advantage, to consider and value the interests of the student, with a view to enhancing their involvement and active participation.

1.4. Importance of school-family articulation

In the school context, teachers try to know and understand the student through what he shows him directly, however he must also understand him in the light of a systemic perspective, that is, behind each student there is a family made up of several members, with their values, functioning and material and emotional needs (Carvalho, 2017). Thus, when a student enters school, he should not be considered as an individual, but as someone inserted in a cultural, social and family context (Reis, 2012).

In fact, the school context as well as the family context must remain linked and predisposed to share information they have, in order to act together in the success of the development of the child's cognitive and social skills, this involvement of the parents in the child's educational process with special educational needs (SEN), as is the case with children with Autism Spectrum Disorder (ASD), assumes an even more fundamental character for their educational success (Reis, 2012). Nevertheless, Reis (2012) states that there is a willingness of parents to get involved in their children's educational practices, but that many of them do not know how to do it, do not have the time available and / or refer that the school does not encourage this involvement and participation. Carvalho (2017) understands the notable difference in terms of the nature of each of these two contexts mentioned above, however the author stresses that both have very similar objectives and concerns with regard to their students and, for this reason, the school context should create the conditions necessary to foster frequent contact with the families of their students.

In addition to a curriculum that considers the needs of children with ASD and values their interests, the articulation between the School and the family system is equally relevant. Success in acquiring the different stages of the process of communication, learning, and autonomy of a child ASD is closely related to their skills, but also with the attitude and skills of their family members to face of this disturbance (Gomes, 2013). The birth and growth of a child with neurodevelopmental problems encourage parents to accept their condition, and to seek to apply the responses that best fit their child's real needs and abilities (Gomes, 2013). Likewise, according to Gomes (2013), it is of great importance that parents share information about the child to school so that the institution meets the necessary conditions for the promotion and enhancing their skills. Similarly, it is essential that these families, as well as schools, are aware of the importance of implementing strategies that enhance the development of communication, learning, and autonomy, and where students perform domestic tasks, solve problems and are stimulated in negotiation skills as a way of promoting responsibility and self-control (Silva, 2015).

The coordination between the school and the families of children and/or young people with special educational needs should also take into account the fragility that this type of family system experiences, with a great tendency towards social isolation that makes these

families often have difficulties in taking the initiative to address and articulate with the school (Carvalho, 2017). In order to be able to promote resilience in a child, especially those with SEN, it is first necessary to work on the resilience of their families, through guidance, emotional support and psychological support, so that they feel able to interact and educate their children (Carvalho, 2017). Guidance should occur because, generally, this type of families, given the emotional overload they feel and the consequent social isolation, are often little and / or inadequately informed about the best procedures to be carried out to satisfy emotional, social and educational needs for their children. For this reason, the articulation between schools and families of children and / or young people with SEN is crucial and inevitable, where formal and / or informal meetings should be given priority, providing these families with pedagogical guidance but also emotional and psychological support. (Carvalho, 2017).

A close sharing relationship between family and school is a fundamental factor for the good prognosis in the evolution of the functionality of children with neurodevelopmental disorders (Martins, Acosta & Machado, 2016).

2. METHODOLOGY

The present study started in 2017, with data collection and dissemination of results taking place in 2019.

The first stage was to carry out a review of relevant literature on the different topics covered, with a view to the elaboration of data collection protocols, through two structured interviews addressed to the parents and to the teacher (s) / educator (s) of the student diagnosed with ASD.

This investigation, called the Epidemiological Study of the ASD in the Azores assumed as a general objective:

Assess and update the Azores data regarding the prevalence of children diagnosed with ASD, from 3 to 11 years of age, who were enrolled in kindergarten and in the 1st cycle of basic education. Given the vast selection of variables under study, which make up the data collection protocols, the following objectives were also defined as specific objectives of this study:

Characterize the functional profile of children with ASD in pre-school and school age living in the Azores, from the perspective of caregivers;

To characterize the functional profile of children with ASD in pre-school and school age living in the Azores, in the perspective of the educator (s) / teacher (s);

Characterize the impact of the diagnosis on the family of the child with ASD, regarding psychological well-being; Personal-Social and material.

In the case of this article, in specific, the procedures will be described and the data related to the first two specific objectives, mentioned above, will be presented.

After a positive opinion by the Ethics Committee of the University of the Azores and the Regional Directorate for Education of the Azores, the research team initiated contacts with the Executive Councils and Directive Councils, for the application of the Education Protocol and the Family Protocol, in the Organic Units (30), Private Schools (8) and Kindergartens of the Network of Public Institutions of Social Solidarity (PISS) (40) of the entire Azores.

All the parents who consented to participate in this investigation signed an informed consent document that guaranteed the anonymity and confidentiality of the information obtained.

Together with all of the top departments for these educational institutions, the number of children enrolled, per cycle, within the age groups that the study comprises was determined, as well as the number of children diagnosed with ASD, for the purposes of treatment and statistical analysis of data.

The target population comprises 172 children with a diagnosis of ASD. It was used a sample of 121 children whose parents agreed to participate in the study, mostly boys (82%), the average age of 6 and a half years old. Half of the children have mildly severe ASD, 32% a moderate degree, 4% a severe degree, and 14% did not report.

The data were collected through structured interviews, based on a literature review on autism, instruments used in the identification and characterization of autism, and the variables of the International Classification of Functioning, Disability, and Health (ICF) in the domain of communication, learning, and autonomy. The interview with caregivers was composed of five dimensions: i) personal data of the child; ii) socio-family characterization; iii) clinical history; iv) functionality and participation profile; v) impact of ASD on the family. The interview with educators comprised three dimensions: i) data from the institution; ii) student's personal data; and iii) functionality and participation profile.

This study was previously submitted to the Regional Directorate of Education and to the Ethics Committee of the University of the Azores, having been issued by both entities in favour of its realization. The parents were also auscultated, through the respective educational institutions, who explained the nature and purpose of the study. Families who agreed to collaborate and consented to the consultation of their children's Individual Educational Programs (IEP) signed their Informed Consent. All collected data were entered into IBM SPSS Statistics, constituting a database with 121 rows, each of which refers to each case of ASD. Data were analyzed using some methods of Descriptive Statistics and the hypothesis test for the difference between two proportions, with the purpose of verifying whether the perceptions of the school and the family differ significantly or not regarding the functionality of the profile of children with ASD, with regard to communication, learning and autonomy.

2.1. Presentation and analysis of results

Tables 1, 2 and 3 present a summary of the results regarding the functionality profile of children with ASD, regarding, respectively, “Communication”, “Learning and Application of Knowledge” and “Autonomy” (self-care), from the perspective of educators/teachers and of parents/family/ caregivers. The last column of each table is concerning the hypothesis test for the difference between two proportions.

It was found that there are statistically significant differences ($p < 0.01$) between the perceptions of the school and the family regarding all items of functionality, associated with communication and learning, presented in tables 1 and 2.

Table 1.
Communication: Comparison between the two perspectives (%).

Communication	Does not do it alone/Some kind of disability		Statistic of test (Z)
	"School" Perception	Family Perception	
Communicate and receive oral messages	88.2	47.9	6.54*
Communicate and receive nonverbal messages	87.5	57.9	4.63*
Speak	82.4	52.1	4.85*
Produce nonverbal messages	86.4	57.9	4.31*
Conversation	92.1	63.6	4.76*
Discussion	91.5	62.0	4.45*
Use of communication devices	73.4	39.7	3.86*

* Difference is significant at the 0.01 level (2-tailed)

The biggest difference between both perspectives lies in the task of "Communicate and receive oral messages" and the smallest differences lie in the tasks of "Conversation" and "Produce nonverbal messages". However, in both cases, school elements perceive greater difficulties.

Table 2.
Learning and Knowledge Application: Comparison between the two perspectives (%).

Learning and Knowledge Application	Does not do it alone/Some kind of disability		Statistic of test (Z)
	"School" Perception	Family Perception	
Observe	67.0	19.0	7.07*
Listen	59.8	20.7	5.84*
Imitate	75.8	22.3	7.90*
Learn By Interacting with Objects	71.4	20.7	6.38*
Acquire information	80.0	40.5	5.84*
Acquire language	82.7	50.4	4.97*
Rehearse (Repeat)	77.3	52.1	3.72*
Think	89.0	33.9	7.77*
Solve Problems	93.3	68.3	4.09*
Make Decisions	91.4	54.5	5.56*

* Difference is significant at the 0.01 level (2-tailed)

The biggest differences between both perspectives are in the items "Think" and "Imitate" and the smallest differences are in the items "Solve Problems" and "Rehearse". However, both parts consider that the most significant difficulties are located in the areas of problem solving and decision making.

The autonomy skills were analysed in the light of self-care. The observation of Table 3 indicates that this is the area of greatest consensus between Educators/teachers and parents/family. In this context, it was found that there were no statistically significant differences between the perceptions expressed by the two parties regarding the items "Take care of body parts", "Care related to excretion processes", "Dress up", "Take care of their own health". However, significant differences were found between the perceptions of the two parties regarding the functionalities related to the items "Eat" ($p < 0.01$) and "Drink" ($p < 0.05$), with the school perceiving greater difficulties, compared to families.

Table 3.
Self-care: Comparison between both perspectives (%).

Self-care	Does not do it alone/Some kind of disability		Statistic of test (Z)	p
	"School" Perception	Family Perception		
Take care of body parts	57.4	69.4	-1.61	0.107
Care related to excretion processes	51.9	58.7	-0.96	0.338
Dress up	60.5	60.3	0.02	0.984
Eat	50.0	28.9	3.06	0.002*
Drink	31.7	17.5	2.38	0.017**
Take care of their own health	50.0	62.0	-1.26	0.209

* Difference is significant at the 0.01 level (2-tailed)
** Difference is significant at the 0.05 level (2-tailed)

The results of the present study prove the existence of a very different perspective about the skills of children with ASD, by caregivers and educators, mainly in the fields of Communication and Learning and Application of Knowledge. Although both perspectives identify limitations regarding the functionality of children with ASD, it is clear that caregivers have a more optimistic view of their children's skills. The average age of children in the sample, 6 years old, may partially explain these findings. It might be not easy for educators to find and implement teaching and interaction methodologies that overcome ASD's limitations

This brings us to the importance of practicing a teaching methodology such as UDL that enables these children to demonstrate their knowledge through multiple forms of expression and motivates them to achieve curriculum learning goals effectively and with significant involvement and participation. The positive results of this involvement in learning could contribute to cooperative work and closer communication between school and family, encouraging more realistic and objective expectations regarding the empowerment of children with ASD. In addition, it is important to increase training opportunities for professionals in various areas to improve their performance regarding the ASD.

3. CONCLUSION

The present work aimed to perform a characterization of the functionality profile of children with ASD in Azores, according to the perspectives of their educators / teachers and families. Children with ASD usually have significant difficulties in the areas of communication, socialization and behaviors. As such, it is essential to know not only the level of these limitations, but above all their areas of interest and their skills so that staff and family members can be successful in carrying out their mission. Pedagogical assessment and teaching methodologies with an emphasis on the active and motivated participation of these students can, according to current literature, contribute more efficiently to the optimization of these children as autonomous students and future youth and adults with a proactive role in society.

This study pointed out differences in the way parents and teachers think about children with ASD and their learning. Knowing these differences can be advantageous, for several reasons, namely for allowing a greater articulation between parents and teachers.

As limitations of the study, we identify the information collection instrument itself, which is used as an evaluation instrument in school contexts, and did not allow characterizing the sample profile regarding its areas of interest and motivations. Another weakness of this study was the failure to collect information regarding the methodology, strategies and learning support materials used by schools. Future research in this domain should improve data collection methods and contribute to optimizing the response in the areas of training, consulting and intervention within the scope of the ASD. It is also suggested to expand the study to other age groups.

REFERENCES

Abreu, C. C. (2013). *Avaliação de alunos com perturbações do espectro do autismo em unidades de ensino estruturado do 1º ciclo* [Assessment of students with autism spectrum disorders in structured primary school teaching units] (Master's thesis, Instituto Superior de Educação e Ciências, Lisboa). Retrieved from http://hdl.handle.net/10400.26/9475

American Psychiatric Association (2013). *Manual Diagnóstico e Estatístico de Transtornos Mentais: DSM-5* (5ªed) [Diagnostic and Statistical Manual of Mental Disorders: DSM-5] (5th ed.). Porto Alegre: Artmed

Brown, J., & Whiten, A. (2000). Imitation, theory of mind and related activities in autism. *Autism*, *4* (2), 185-204.doi: 10.1177/1362361300004002006

Carvalho, A. C. A. (2017). *A importância da família na inclusão escolar de crianças e jovens com necessidades educativas especiais* [The importance of the family in the school inclusion of children and young people with special educational needs] (Master's thesis, Universidade Católica Portuguesa de Braga, Faculdade de Filosofia e Ciências Sociais). Retrieved from https://repositorio.ucp.pt/bitstream/10400.14/24115/1/Disserta%C3%A7%C3%A3o%20de%20Mestrado%20Ana%20Catarina.pdf

CPDEC (n.d.). *Classificação Internacional de Funcionalidade, Incapacidade e Saúde: Versão para Crianças e Jovens* [International Classification of Functioning, Disability and Health: Version for Children and Teenagers]. Porto: Faculdade de Psicologia e Ciências da Educação da Universidade do Porto. Retrieved from https://www.dge.mec.pt/sites/default/files/EEspecial/class_int_func_cj.pdf

Denning, C. B., & Moody, A. K. (2013). Supporting Students with Autism Spectrum Disorders in Inclusive Settings: Rethinking Instruction and Design. *Electronic Journal for Inclusive Education*, *3*(1). Retrieved from https://corescholar.libraries.wright.edu/ejie/vol3/iss1/6/

Fernandes, F. (1994). A questão da linguagem em Autismo Infantil: uma revisão crítica da literatura [The issue of language in Child Autism: a critical review of the literature]. *Revista Neuropsiquiatria da Infância e da Adolescência*, *2* (3), 5-10. Retrieved from http://www.psiquiatriainfantil.com.br/revista/edicoes/Ed_02_3/in_05_03.pdf

Goldstein, G., Johnson, C. R., & Minshew, N. J. (2001). Attentional Processes in Autism. *Journal of Autism and Developmental Disorders*, *31*(4), 433-440. doi: 10.1023/A:1010620820786

Gomes, M. (2013). *Envolvimento familiar e autonomia na criança com Síndrome de Asperger* [Family involvement and autonomy in children with Asperger's Syndrome] (Master's thesis, Escola Superior de Educação de Paula Frassinetti). Retrieved from http://hdl.handle.net/20.500.11796/1257

Green, D., Charman, T., Pickles, A., Chandler, S., Loucas, T., Simonoff, E., & Baird, G. (2008). Impairment in movement skills of children with autistic spectrum disorders. *Developmental Medicine and Child Neurology*, *51*(4), 311–316. doi 10.1111/j.1469-8749.2008.03242.x

Hewitt, S. (2006). Compreender o Autismo – Estratégias para alunos com Autismo nas escolas regulares [Understanding Autism - Strategies for students with Autism in regular schools]. Porto: Porto Editora.

Lyall, K., Croen, L., Daniels, J., Fallin, M. D., Ladd-Acosta, Lee, B. K.,…Newschaffer, C. (2017).The Changing epidemiology of autism spectrum disorders. *Annual Review of Public Health*, *38*, 81-102. doi:10.1146/annurev-publhealth-031816-044318

Lobo, C. (1998). *Perturbações do Espectro do Autismo: do Conceito à Intervenção* [Autism Spectrum Disorders: From Concept to Intervention] (Master 's thesis, Escola Superior de Educação de Coimbra).

Mancil, G. R., & Pearl, C. E. (2008). Restricted interests as motivators: Improving academic engagement and outcomes of children on the autism spectrum. *Teaching Exceptional Children Plus*, *4*(6), 1-15. Retrieved from https://files.eric.ed.gov/fulltext/EJ967728.pdf

Martins, M. F. A., Acosta, P. C., & Machado, G. (2016). A parceria entre escola e família de crianças com transtorno do espectro do autismo [The partnership between school and families of children with autism spectrum disorder]. *Caderno de Pesquisas em Educação*, *43*, 59-71.doi: 10.22535/cpe.v0i43.14308

Matson, J. L., & Shoemaker, M. (2009). Intellectual disability and its relationship to autism spectrum disorders. *Research in Developmental Disability*, *30*(6), 1107–1114.doi:10.1016 / j.ridd.2009.06.003

Matson, J. L., Baglio, C. S., Smiroldo, B. B., Hamilton, M., Packlowskyi, T., Williams, D., Kirkpatrick-Sanchez, S. (1996). Characteristics of autism as assessed by the Diagnostic Assessment for the Severely Handicapped-II (DASH-II). *Research in Developmental Disabilities*,*17*(2),135-143. doi: 10.1016/0891-4222(95)00044-5

Mcleskey, J., & Waldron, N. L. (2007). Making differences ordinary in inclusive classroom. *Intervention in School and Clinic*, *42* (3),162-168. doi: 10.1177/10534512070420030501

Meyer, A., Rose, D. H., & Gordon, D. (2014). *Universal design for learning: Theory and Practice*. Wakefield, MA, CAST Professional Publishing

Mota, M. (2008). Avaliação da maturação percepto-cognitiva e do comportamento motor em crianças com transtorno autista: Indicações ao trabalho do educador [Assessment of perceptual-cognitive maturation and motor behavior in children with autistic disorder: Indications for the educator's work]. *Revista Electrónica de Investigación y Docência*, *1*, 71-98. Retrieved from https://revistaselectronicas.ujaen.es/index.php/reid/article/view/950

Pereira, F. (2008). *Unidades de Ensino Estruturado para Alunos com Perturbações do Espectro de Autismo – Normas Orientadoras* [Structured Teaching Units for Students with Autism Spectrum Disorders – Guidelines]. Lisboa: Ministério da Educação - DGIDC. Retrieved from https://www.appdaleiria.pt

Oliveira, G. G. (2005). *Epidemiologia do autismo em Portugal: Um estudo de prevalência da perturbação do espectro do autismo e de caracterização de uma amostra populacional de idade escolar* [Epidemiology of autism in Portugal: A study on the prevalence of autism spectrum disorder and the characterization of a population sample during school years] (Doctoral dissertation, Faculdade de Medicina de Coimbra, Portugal). Retrieved from http://hdl.handle.net/10316/848

Ortiz, F. (2005). Autismo [Autism]. *Gaceta Médica de México*, *141* (2), 143-147. Retrieved from http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0016-38132005000200009&lng=en&tlng=

Reis, V. A. S. (2012). *O envolvimento da família na educação de crianças com necessidades educativas especiais* [Family involvement in the education of children with special educational needs] (Master's thesis, Escola Superior de Educação João de Deus, Lisboa, Portugal). Retrieved from http://hdl.handle.net/10400.5/11756

Reis, D. D. L., Neder, P. R. B., Moraes, M. C., & Oliveira, N. M. (2019). Perfil epidemiológico dos pacientes com Transtorno do Espectro Autista [Epidemiologial profile of patients with autism spectrum disorder]. *Research Medical Journal*, *3*(1), 1-8. doi: 10.4322/prmj.2019.015

Sigafoos, J., Roberts-Pennell, D., & Graves, D. (1999). Longitudinal assessment of play and adaptive behavior in young children with developmental disabilities. *Research in Developmental Disabilities*, *20* (2), 147–161. doi: 10.1016 / s0891-4222 (98) 00038-9

Silva, R. M. C. (2015). O papel da família no desenvolvimento da autonomia do portador de sindroma de Asperger [The role of the family in the development of the autonomy of patients with Asperger's syndrome] (Master's thesis, Escola Superior de Educação João de Deus, Lisboa, Portugal). Retrieved from http://hdl.handle.net/10400.26/10598

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

WHO (1993). *The ICD-10 classification of mental and behavioral disorders: Diagnostic criteria for research*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/handle/10665/37108

AUTHORS' INFORMATION

Full name: Tânia Silva Botelho
Institutional affiliation: Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)
Institutional address: Av. Natália Correia, n51, 2ª, 9500-435 Ponta Delgada
Short biographical sketch: Graduated in Speech Therapy from the School of Technologies and Health of Porto. She began her professional activity in 2009, in school's context, as part of the Special Education Center, as a speech therapist. Took two Post-Graduations in the fields: "Orofacial Motricity" and "Developmental Disorders" – from early childhood to adolescence". In 2015 participated in the creation and launch of a didactic application, "Júlia e Gui – Uma Aventura na ilha das palavras", whose content is intended to stimulate preschool and school level language skills. In 2011, she made part of the multidisciplinary team at the "Centro de Desenvolvimento Infanto- Juvenil dos Açores (CDIJA)", where she works as a speech therapist and researcher in the Epidemiological Study of the Disorder of the Spectrum of Autism in the Autonomous Region of the Azores, until today.

Full name: Pilar Veríssimo Mota
Institutional affiliation: Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)
Institutional address: Av. Natália Correia, n51, 2ª, 9500-435 Ponta Delgada
Short biographical sketch: Degree in Psychology, Faculty of Psychology and Educational Sciences, University of Porto, in 2004; Between 2004 and 2013, "Integração na Rede de Apoio à Mobilidade Humana", as a clinical psychologist at ARRISCA, having as target audience, a public in severe social exclusion; Advanced specialty in Community Psychology, by the Order of the Portuguese

Psychologists; Specialty in Clinical and Health Psychology, by the Order of the Portuguese Psychologists; Intensive Postgraduate in Cognitive-behavioral Therapies: Evaluation and Intervention, by CRIAP; Since 2014 she has worked as Clinical Coordinator of the multidisciplinary team of the "Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)", supporting the management of human resources, intervision of clinical meetings, as well as project management, among which stands out the Epidemiological Study of Perturbation of the Autism Spectrum in the Autonomous Region of the Azores.

Full name: Ana Patrícia Ribeiro de Matos
Institutional affiliation: Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)
Institutional address: Av. Natália Correia, n51, 2ª, 9500-435 Ponta Delgada
Short biographical sketch: Born in Lisbon in 1990, currently residing in Ponta Delgada. Completed the Integrated Master in Clinical Psychology, with a merit diploma, at the "Instituto Universitário de Ciências Sociais e da Vida", in Lisbon. In 2013 obtained training and participated in the content analysis of a qualitative study, integrated in a research project of the educational establishment where she took her studies. She completed her professional internship for the Order of the Portuguese Psychologists at the "Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)" in Ponta Delgada, where she currently works as a clinical psychologist and researcher on the project "Perturbação do Espectro do Autismo no Arquipélago dos Açores – Estudo Epidemiológico (PEA-EEAz)", financed by the Gaspar Furtuoso Foundation.

Full name: Bárbara Romão
Institutional affiliation: Centro de Desenvolvimento Infanto-Juvenil dos Açores (CDIJA)
Institutional address: Natália Correia, n51, 2ª, 9500-435 Ponta Delgada
Short biographical sketch: Degree in Medicine from the University of Porto; Specialization in Child and Adolescent Psychiatry at Centro Hospitalar do Porto, with training in Early Childhood; Post-graduation in Family Therapy by the Portuguese Society of Family Therapy; Post-graduation in the DIR / Floortime Model (intervention in autism and other development challenges); Responsible for the creation of the Children's Day Hospital and for the Early Childhood Consultation of the Centro Hospitalar Gaia / Espinho; Clinical supervisor of ART "(Associação de Respostas Terapêuticas)"; Collaborator and author of several scientific articles in magazines specializing in Child and Adolescent Psychiatry. 1st place at "Prémio João dos Santos" in 2008 with the scientific article "Desdiagnosticar Autismo", published in "Revista Portuguesa de Pedopsiquiatria".

Full name: Áurea Sandra Toledo de Sousa
Institutional affiliation: University of the Azores, School of Sciences & Technology and CEEAplA
Institutional address: Rua Mãe de Deus, 9500-321, Ponta Delgada
Short biographical sketch: BSc in Mathematics, Universidade dos Açores, 1992. MSc in Statistics and Management of Information, Universidade Nova de Lisboa, 1997. PhD in Mathematics in the speciality of Probability and Statistics, Universidade dos Açores, 2006. Professor at Universidade dos Açores since 1992 and researcher at Center of Applied Economics Studies of the Atlantic since 2011. Her primary research interests are in the areas of Multivariate Data Analysis, Probability and Statistics, Symbolic Data Analysis (SDA), and Computational Statistics. In these areas, she has presented national and international communications, and has published several research papers in international peer-reviewed journals. Also co-authored of some books. ORCID: http://orcid.org/0000-0003-3151-5237

Full name: Isabel Maria Cogumbreiro Estrela Rego
Institutional affiliation: University of the Azores and member of IVAR
Institutional address: Rua Mãe de Deus, 9500-321, Ponta Delgada
Short biographical sketch: has a B.A. in Psychology from Northeastern University (1980), an M.A. in Counseling Psychology from Boston College (1982), and a Ph.D. in Educational Psychology from the University of the Azores (1999). She is currently Associate Professor in the Department of Psychology, at the University of Azores where she has been teaching social, community,

developmental, and environmental psychology. She was a member of the Research Centre for Biodiversity and Genetic Resources (CIBIO – Azores Group) until October of 2013 and has afterwards joined the Research Institute for Volcanology and Risk Assessment (IVAR). Her research interests have initially included attitudes and behavior in the field of education and, more recently, risk perception and communication, disaster preparedness, pro-environmental attitudes, sustainable behavior, community development, and person-place relationships.

Full name: Osvaldo Dias Lopes da Silva
Institutional affiliation: University of the Azores and member of the Interdisciplinary Center for Social Sciences at the Universidade Nova de Lisboa (CICSNOVA.UAc)
Institutional address: Rua Mãe de Deus, 9500-321, Ponta Delgada
Short biographical sketch: Assistant Professor at Department of Mathematics and Statistics, Faculty of Science and Technology, University of the Azores (UAc), Portugal. He holds a PhD in Mathematics – Probability and Statistics from the University of the Azores and is an integrated member of the Interdisciplinary Center for Social Sciences at the Universidade Nova de Lisboa (CICSNOVA.UAc).His interests in the areas of research include Data Analysis, especially Multivariate (exploratory and confirmatory techniques); Sampling, Quality Control and Statistical Methodologies applied (with particular interest in Social and Health Sciences). He is author and coauthor of several articles in national and international magazines, chapter of books and proceedings in these areas. ORCID: http://orcid.org/0000-0002-0269-8153

Full name: Suzana Nunes Caldeira
Institutional affiliation: University of the Azores, School of Social Sciences & Humanities and member of the Interdisciplinary Center for Social Sciences at the Universidade Nova de Lisboa (CICSNOVA.UAc)
Institutional address: Rua Mãe de Deus, 9500-321, Ponta Delgada
Short biographical sketch: Associate Professor in the Psychology Department at the University of the Azores (UAC) and, currently, Vice-President of the School of Social Sciences and Humanities. She completed the undergraduate degree in Psychology at the University of Lisbon in 1986 and the PhD in Educational Psychology at the University of the Azores in 2000. She has published extensively and her main research interests are in the field of disruptive/ conflictive behavior in different contexts and conflict management and prevention. In these areas, she has presented national and international communications, and has published several research papers in international peer-reviewed journals. Also co-authored of some books. ORCID: https://orcid.org/0000-0002-1024-6958