Cite as: Trancoso, I., & Alarcão, S. M. (2023). Assistive Technologies in Psychomotricity Sessions with Children Diagnosed with Autism Spectrum Disorder. In C. Sousa, & A.H. Tkaczyk (Eds.), *Media Literacy and Assistive Technologies for Empowerment in Autism* (pp. 130-136). Edições Universitárias Lusófonas. https://www.doi.org/10.24140/asdigital.v1.p02.07

Assistive Technologies in Psychomotricity Sessions with Children Diagnosed with Autism Spectrum Disorder

Isabel Trancoso (fc60580@alunos.fc.ul.pt) – LASIGE, Faculdade de Ciências, Universidade de Lisboa, Portugal
Soraia M. Alarcão (smalarcao@ciencias.ulisboa.pt) – LASIGE, Faculdade de Ciências, Universidade de Lisboa, Portugal

Abstract
This chapter aims to describe how Psychomotricity can be beneficial for children with ASD through the use of ATs. We present a practical case of a seven-year-old girl whose main difficulties were establishing friendships and regulating her emotions, namely her aggressiveness. The results obtained after six months of follow-up revealed that the girl's interactions with peers and family, her academic performance, and her ability to participate in group activities improved as her communicative skills were progressively encouraged. Although ATs were not used in this practical case, we suggest adapting the instruments used, hypothesizing that their use will be even more beneficial in intervention with children with ASD in the context of Psychomotricity.

Keywords: Assistive Technologies; Psychomotricity; Autism Spectrum Disorder; Communication Skills; Intervention Adaptation.

Assistive Technologies (AT) are an increasingly explored domain in the context of neurodevelopmental disorders, as they aim to improve the functional capacities of people with disabilities (Boucher, 2018). As Autism Spectrum Disorder (ASD) is considered a disability of this nature, we present a use case of a girl with this diagnosis who participated in Psychomotricity sessions in which the use of AT was advantageous. Psychomotricity is the science that has as its object of study the human being in its relation to the external world through interactions with objects, other individuals, and oneself (Jesus, 2019). In this sense, the human's physical body is considered the tool that is essential to perform those interactions since it is the result of cognitive and organic acquisitions. This way, in Psychomotricity, attention should be paid to three main domains that are undoubtedly related to human development: movement, intellect, and affection.

According to Henri Wallon (n.d., cit. in Mahoney & Almeida, 2005), a child's development depends not only on their genome but also on the conditions of the environment where they are inserted, knowing that these conditions will promote her maturation through observation and experimentation. This way, there's a biological potential waiting for some external stimuli capable of initiating specific changes in the individual, leading to different behavioral responses. So, the assessment of a child's development could not be limited to just one perspective but through the analysis of several developmental domains, characterizing the human being as "genetically social" (Wallon, 1925, cit. in Mahoney & Chamorro, 2005).

On the other hand, the way children respond to different meaningful stimuli through their body movements will also benefit their neurological maturation. So, one could say that there is a multi-factor relationship that induces the growth of an individual as a whole. If initially there are primitive motor reflexes in infants whose function is to explore the world and its characteristics, later, when neurological maturation takes place, those reflexes are inhibited, being replaced by motor actions capable of expressing feelings and intentions (Wallon, 1925, cit. in Fonseca, 2010).

In other words, the origin of all types of movement and voluntary actions occurs due to our capabilities to interact socially. This predisposition depends on establishing meaningful bonds with what surrounds us and ourselves (Fonseca, 2010). Therefore, psychomotor therapy should focus on carrying out ludic-pedagogical activities that provide children with

ways of building their personality and maintaining the balance between personal affirmation and respect for others, which is only possible through the construction of relationships (Lapierre, 1968, cit. in Fonseca, 2010).
The practice of Psychomotricity with children diagnosed with ASD is essential to develop their cognitive, emotional, and social domains, educating the body and mind as a whole. For these children, it is often difficult to communicate (verbally and/or non-verbally) and express feelings through social interaction. These limitations can be characterized by difficulties in posture, facial expressions, and inappropriate gestures for the context, and by reluctance to share objects, make friends and participate in group activities (American Psychiatric Association, 2013). Regarding ASD and taking into account the most common symptoms presented in children with this diagnosis, the main purposes of AT focus on communication skills, social interaction, and independent living.

Practical Case

To begin with, it is important to keep in mind that psychomotor therapy is not exclusively aimed at intervening in a specific disorder such as ASD. Psychomotricity sessions intend to train the body and mind together through the development of multiple skills, such as communication, motricity, cognition, and affectivity, making Psychomotricity suitable for every person, even the ones without any diagnosed disorder.
Each session is unique, given the individual characteristics of both the person with disabilities and the therapist. Although the symptoms of a given disorder may be common to several individuals with the same diagnosis, some particularities differentiate each one, such as personal preferences, previous experiences, family context, and receptivity to new stimuli. So, the therapist must build an intervention plan oriented to minimize the difficulties experienced by the person with the disability, always focusing on these specificities. Thus, the activities chosen for the intervention plan should meet the child's interests to motivate them. In some cases, it is useful to let the child choose the activities and the materials they prefer to use. In this way, the therapist can get to know the child better and is able to assess their behavior and the intentional content represented in each activity. On the other hand, the child has enough freedom to decide what to do, so they will feel more comfortable and confident in establishing a bond with the therapist.

Example of Alice:

- Alice (fictitious name) is a girl that was diagnosed with ASD at the age of four;
- Before the diagnosis, she never had any therapeutic follow-up and started participating in psychomotor rehabilitation sessions with seven years old;
- Her mother's main concerns were her aggressive tone of voice and difficulty sharing toys with her two brothers;
- After talking to Alice's teachers, it was noticed that it was difficult to find an activity that motivated her during the classes and that her academic evaluation was below the average for the class;
- Her favorite hobbies were playing Super Mario on the console and watching cartoons, while at home. At school, Alice avoided spending breaks with her classmates and refused to participate in group activities.

In the first session, Alice was free to explore the therapy room and the available materials. The goal was for the girl to familiarize herself with the space and our presence, showing her that she was safe and could be herself during those sessions. In free and spontaneous activities, children "tell us" a little about themselves through their bodies (Araújo & Chamorro, 2021). They can choose whether to speak, shout or remain silent, whether they want to jump or sit, and whether they prefer to explore the space or show disinterest. And these types of behavior are essential for a therapist to know the main aspects to be worked on. The following sessions aimed to establish a bond with Alice, in which we chose to play games like the memory game (with cards), find hidden objects in the room, and touch an object of the intended color. At the same time, we asked questions about the girl and incited her to do the same about us. According to Araújo & Chamorro (2021), the act of playing is one of the most important ways to welcome a child, establish an affective bond and allow their independence and autonomy during Psychomotricity sessions through the development of motor, cognitive, and emotional domains.

Over time, we realized that Alice avoided talking about herself, even after some sessions in which verbal communication was already more fluid and confident. So, to overcome this barrier, we opted for the make-believe game using puppets, in which Alice could choose the puppets, create the characters and invent the story in her own way. The most interesting thing

about this activity was that Alice began to portray her life: how she saw her siblings, the tasks her mother asked her to do at home, and how her classmates treated her at school. And session after session, we discussed her feelings and frustrations about her day-to-day events and the possible reasons for explaining them. Through this activity, Alice became aware of her behavior. Whenever something happened during the week for which she could not control her aggressiveness, for example, this was discussed in the next session.

This example of the intervention with Alice shows us that the exclusive interaction between the therapist and the child is not always enough. In this case, using AT, such as puppets and other objects in the room, promoted Alice's trust and openness to talk about herself and act freely during the therapeutic sessions. In addition, the progress seen during the sessions was reflected in the improvement of interaction between Alice and her colleagues and family, so that communication was less aggressive and showed greater empathy. The psychomotor rehabilitation sessions lasted about six months, and it was expected that Alice would be monitored for some more time with the help of her family and teachers. In this sense, it would be beneficial for the work done during the therapy to continue. For that to happen, we give some suggestions in terms of the applicability of the AT used, given Alice's interest in video games and technology: i) replacement of puppets by interaction with virtual agents in an application for the tablet or computer; ii) promoting playing with didactic and educational games; iii) use of tangible objects for multi-sensory stimulation.

Changing the AT used during therapy to AT with a "more technological nature" will allow a child to be supported for a longer period of time throughout the week instead of just one day a week. In addition, these ATs will enable the child to gain a sense of autonomy when trying to solve problems by themself and, when this is not possible, to be able to interact with teachers and/or family for help, promoting social interaction. On the other hand, digital games have the advantage of having several characteristics through different visual and sound effects, which makes it possible to stimulate the senses while contributing to the child's cognitive development. And finally, because tactile experiences are very important, especially for children with ASD, the use of tangible objects can not only contribute to tactile stimulation but also allow children to recognize that every action on the object has a virtual consequence. This type of reasoning

can be reflected in the day-to-day life of these children, promoting self-awareness in their behaviors, leading to greater care with objects, other people, and oneself.

As previously mentioned, AT are designed to help people with disabilities to have more autonomy and to overcome the difficulties experienced. Through Alice's example, it is possible to verify that the use of AT in the context of psychomotor rehabilitation is essential to ensure greater effectiveness of the therapy, especially in improving interpersonal relationships. However, it is important to point out that ATs should not be restricted to the therapeutic context to allow people with difficulties to be independent in their daily lives, where the aid of family and friends is crucial. On the other hand, some of the currently existing ATs are not accessible to all people, either because of their price, size, or practicality of use, so it is increasingly relevant to explore and develop this scientific area, facilitating the inclusion of people with disabilities in society.

Acknowledgements

This work was supported by national funds through Fundação para a Ciência e a Tecnologia (FCT) through LASIGE Research Unit, ref. UIDB/00408/2020 and ref. UIDP/00408/2020.

The authors would like to acknowledge networking support by the COST Action a-STEP: advancing Social inclusion through Technology and EmPowerment – CA19104 (www.a-step-action.eu), supported by COST (European Cooperation in Science and Technology; www.cost.eu).

References

American Psychiatric Association. (2013). Neurodevelopmental Disorders. Autism Spectrum Disorder. In *Diagnostic and statistical manual of mental disorders: DSM-5* (5th ed., pp. 50–59).

Araújo, E., & Chamorro, L. (2021). O Brincar Terapêutico: Estratégia clínica da Psicomotricidade com abordagem Relacional no tratamento da criança com Transtorno do Espectro do Autismo – Caso clínico. *Revista Interdisciplinar Saberes, 4*(1), 19–34.

Boucher, P. (2018). Assistive technologies for people with disabilities. IN-DEPTH ANALYSIS. European Parliamentary Research Service, STOA.

Fonseca, V. da. (2010). *Manual De Observação Psicomotora: Significação Psiconeurológica dos deus Factores* (3rd Ed.). ncora Editora.

Jesus, S. G. de. (2019). Educação Psicomotora no desenvolvimento de crianças com autismo. *Diamantina Presença, 2*(1), 78–87.

Mahoney, A. A. & De Almeida, L. R. (2005). Afetividade e processo ensino-aprendizagem: contribuições de Henri Wallon. *Psicologia da Educação, 20*, 11–30.