ASLED
SPORTS ACTIVITIES FOR PEOPLE WITH SPECIFIC LEARNING DISORDERS

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A Guide to Physical Activities for Individuals with Specific Learning Disorders. Educational Insights for Instructors, Social Workers, Volunteers, and Families

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EDA® European Dyslexia Association

aid ASSOCIAZIONE ITALIANA DISLESSIA

dyslexia association of ireland

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1. Introduction

Borges, Fernanda (Universidad Católica de Murcia)

1.1. Presentation of the subject

Dyslexia is a learning disorder that affects a person's ability to read, write, and process language efficiently. Often, people with dyslexia face challenges in the educational and social environment, which can affect their self-esteem and their ability to fully integrate into society. However, research on dyslexia has discovered that regular exercise can have a significant impact on the development of individuals with this disorder.

1.2. Justification of the book

Physical exercise not only improves physical and mental health but can also help improve cognitive and language processing skills in these individuals. In this book, we will explore the importance of practicing sports in the development of people with dyslexia and how it can contribute to their social integration. Through case studies and personal experiences, scientific research and practical advice, on how to use sports as a useful tool to enhance the skills of people with dyslexia and promote their inclusion in society.

1.3. Objectives

• Provide clear and easy-to-understand information about the importance of sports in people's lives, especially for those with dyslexia.
• Offer specific advice and strategies to overcome the challenges of dyslexia through sports practice.
• Motivate and inspire people with dyslexia to stay active and healthy through regular sports practice.
• Help increase the self-esteem and confidence of people with dyslexia by showing them that they can overcome any obstacle and reaching their sports goals.
• Promote the inclusion and participation of people with dyslexia in sports activities, promoting diversity and acceptance.

2. Understanding Dyslexia, Dyscalculia, Dysgraphia and Other Co-Occurring Conditions

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2.1. Dyslexia

Dyslexia is a learning difference that can cause difficulties with learning and work. With the right understanding, accommodations and support people with dyslexia can achieve success in education, the workplace and in wider society.

Everyone with dyslexia is different but there is a commonality of difficulties with reading, spelling and writing and related cognitive/processing difficulties. Dyslexia is not a general difficulty with learning, it impacts specific skill areas. The impact of dyslexia can change according to the environment (i.e. what a dyslexic person is being asked to do and under what circumstances).

Some people with dyslexia can also experience difficulties with sequencing information and also difficulties with orientation and direction. Short term memory can also be an issue. Man dyslexics lack confidence in their abilities and this can worsen their difficulties or lead to stress or anxiety. Also dyslexics can often find it takes them much longer to undertake certain tasks when compared to their non-dyslexic peers.

It affects approximately 1 in 10. It occurs on a spectrum with some people mildly affected and others more severely. Estimates of prevalence vary significantly and depend on the particular definition of dyslexia used in each research study, as well as other factors including language complexity. Depending on the definition used, between 4% to 17% of the population may be considered to have dyslexia. The internationally agreed consensus is that 10% is the average worldwide estimate.

While people with dyslexia may develop strengths due to their dyslexia such as determination, problem solving and resilience, dyslexia does not automatically bring specific gifts or talents. The Dyslexia Association of Ireland recognises and respects the individual variation that all human beings display, including those with dyslexia.

Some people prefer the wording ‘a person with dyslexia’, while others prefer the term ‘a dyslexic person’. When working with individuals it is important to use the terminology that the person is most comfortable with. When communicating with a wider audience the terms may be used interchangeably to reflect the variation of preference that exists.

Dyslexia is a recognised disability under Irish and EU law (such as under equalities, accessibility and disability legislation). However, many dyslexic people do not consider themselves ‘disabled’ and the individual’s view should be respected.

In different jurisdictions, and at different points in recent history, other terms have been used for dyslexia including specific learning disabilities (SLD / SpLD), specific learning difficulties, learning disabilities, specific reading difficulties, reading disorder.

2.2. Dyscalculia

Dyscalculia is a learning difference that can cause difficulties with core mathematics. It affects approximately 6-8% of the population. It occurs on a spectrum with some people mildly affected and others more severely. With the right understanding, accommodations and support, people with dyscalculia can achieve success in education, the workplace and in wider society.

People with dyscalculia lack an intuitive grasp of simple number concepts or ‘number sense’. They have difficulties estimating the magnitude of numbers, exhibit poor understanding of number relationships, and lack fluency with simple numerical operations. Often if the right answer is achieved or the correct procedure followed, it is done so mechanically, with great effort and without confidence. Students with dyscalculia will often experience a lack of confidence or low self-esteem as a result of previous experiences with trying to study math.

These students often experience difficulties with basic mathematical or numerical tasks or processes such as adding, subtracting, multiplying or dividing. Students can also experience difficulty knowing which mathematical process should be employed based on context. Other challenges can include telling the time using an analogue watch or clock, handling money or calculating change. Some students struggle to read and understand the vocabulary in math questions, and therefore do not know what task they are being asked to do. Many different words can be used to describe the same action, e.g. add, increase, plus, total.

Difficulties with orientation and direction can lead to confusion of math symbols. Some people with dyslexia show weakness in the Coding subtest in the assessment, meaning that they struggle to decode symbols accurately and quickly. Memory can also be an issue. There are many facts, figures, tables, and formulas which have to be learnt and recalled accurately. Confidence and anxiety can be an issue and many dyscalculics lack confidence in their own math ability and this can worsen their difficulties.

Dyscalculia is not a general difficulty with learning, it impacts specific skill areas. Dyscalculia is distinct from mathematical difficulties arising from literacy or other learning difficulties, or math anxiety but can co-occur with these difficulties. The impact of dyscalculia can change according to the environment (i.e. what a dyscalculic person is being asked to do and under what circumstances).

Some people prefer the wording ‘a person with dyscalculia’, while others prefer the term ‘a dyscalculic person’. When working with individuals it is important to use the terminology that the person is most comfortable with. When communicating with a wider audience the terms may be used interchangeably to reflect the variation of preference that exists.

Dyscalculia is a recognised disability under Irish and EU law (such as under equalities, accessibility and disability legislation). However, many dyscalculic people do not consider themselves ‘disabled’ and this view should be respected. There is a high incidence of co-diagnosis of dyslexia with dyscalculia. This obviously leads to greater challenges for these students.

2.3. Dysgraphia

Dysgraphia serves as an umbrella term to describe difficulties with writing that significantly impact on academic or daily life. Writing can require additional amounts of concentration and effort, and these difficulties persist despite the provision of extra support and intervention (e.g. additional teaching support when at school).

However, there may be different components to writing difficulties and different underlying causal factors. For example, the difficulties could be: (1) physical difficulties leading to poor or illegible letter/word formation and very slow writing speed; or (2) difficulties with applying the rules of spelling, grammar and punctuation; or (3) difficulties getting ideas down on the page or organizing ideas in a written form that follows a clear logic or narrative that is commensurate with oral ability; or (4) a combination of (1), (2) and/or (3).

If a writing difficulty originates primarily from a physical or fine motor difficulty (See 1 above), then it would be most appropriately assessed by an occupational therapist, using tools measuring such abilities as fine motor skills, dexterity, muscle tone, letter formation and/or speed of writing. Related accommodations might then be focused on physical or manual interventions (e.g. use of a laptop or speech-to-text functionality to accommodate legibility issues; the provision of additional time in exams to accommodate slow handwriting).

For many individuals with a diagnosis of dyspraxia/DCD, physical writing difficulties are very much part of their dyspraxia presentation. If a client presents with a concern about writing difficulties, this can be identified as part of an occupational therapist assessment and supports and accommodations relevant to these writing difficulties would be covered in the report recommendations.

If dysgraphia is more a difficulty with the rules and conventions of written language (See 2 above) or the ability to express ideas in a way commensurate with oral ability (See 3 above), then it could be assessed by an educational psychologist using standardized tests of spelling, writing speed, processing speed, written expression etc. Accommodations might focus on allowing extra time to allow for processing speed issues, or use of a laptop to allow more easy editing of ideas, sentences etc.

For many dyslexic individuals, difficulties with writing are very much part of their dyslexic profile, and these writing difficulties would be commonly identified as part of

an educational psychology assessment and supports and accommodations relevant to spelling and writing difficulties covered in the educational psychologist's report recommendations.

It is possible that someone could be assessed as having dysgraphia, without being either dyslexic or dyspraxic. Many learning differences can co-occur, so there may be more than one reason for the challenges that an individual may experience with writing, irrespective of, or in addition to, a diagnosis of dysgraphia – see below section on Co-occurring conditions)

2.4. Co-ocurring conditions

Dyslexia, dyscalculia and dysgraphia do not always occur in isolation, and often co-occur with each other, and also with other learning difficulties or neurodivergent profiles (e.g. ADHD, Autism DCD/Dyspraxia and Developmental Language Disorder (DLD). Appropriate identification of all the educational needs of an individual is important as this enables the implementation of a range of suitable interventions.

ADD/ADHD (Attention Deficit (Hyperactivity) Disorder is a condition causing persistent difficulties with one or more of the following behaviors: inattention, hyperactivity and impulsivity.

Autism is a lifelong, developmental disability or difference which relates to how a person communicates and interacts with others, and how they experience the world around them.

Dyspraxia or Developmental Coordination Disorder (DCD) is a specific difficulty with movement and aspects of learning such as thinking out, planning and carrying out sensory / motor tasks.

Developmental Language Disorder (DLD) affects communication. Often there are difficulties in language comprehension, expressive language, using language in everyday situations and speech-sound difficulties.

2.5. Video

In this video, dyslexic individuals reflect on what dyslexia means to them and how they describe their dyslexia. These honest reflections show many areas of commonality but

also highlight how dyslexia covers a spectrum and affects people differently. Video created by the Dyslexia Association of Ireland and available on YouTube.

3. The Importance of Physical Activity and Sport in Development

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Physical activity and sport are an essential aspect of human life that has been around for centuries. It is not only a form of entertainment but also a tool for personal and social development. In this chapter, we will explore the physical and mental benefits of sport and how it can be used as a tool for social inclusion and the development of social skills.

Sporting activity represents a fundamental element in the field of physical, psychological development and individual relational life, playing a role that goes beyond the traditional benefits associated with it. The effects that sports practice is able to produce, not only from a physical point of view, but also from a psychological, relational and educational point of view, allow us to consider this factor as an essential tool and element for the training and evolution of any individual. In this sense, the practice of physical exercise, constant and programmed, is able to stimulate and develop the subject's potential and crucial aptitudes both on an individual and relational and social level.

Motor activity, appropriately planned, is able to impact the behavioral perspective of the individual, as it is capable of directing his organizational strategy towards a precise purpose and a specific goal. Furthermore, physical activity amplifies the sense of self-efficacy, enhances the perception and awareness of being able to manage one's own evolutionary path, improving and increasing the ability to implement strategies to deal with conditions that may be perceived as problematic. Taking care of your physical and psychological well-being through sport thus allows you to modify and overturn your life pattern from within, recreating greater awareness and new opportunities for individual growth, through the acquisition of new resources and skills. Sport teaches us to objectively evaluate our limits, to redefine them and transform them into new and unprecedented capabilities, so as to be able to welcome and face difficulties.

These characteristics configure a conceptual framework that fully justifies the use of sport in a broader and more flexible modality since it contributes, through its peculiarities, to increasing and supporting a vast range of behavioral and psychological aspects, fundamental for the correct development of the individual, improving the path and evolution of the subject. Sport, considering its prerogatives and its practice, can therefore become a tool and an operational support that can be used in different contexts and for different needs, a tool of indisputable educational and training value for any problem

3.1. Physical and mental benefits of sport and physical activity

Sport has numerous physical and mental benefits that contribute to the overall well-being of individuals. Some of the physical benefits of sport include:

- Improved Physical Health: Regular participation in sports can help improve cardiovascular health, increase muscle strength, and reduce the risk of chronic diseases such as obesity, diabetes, and heart disease.
- Better Sleep: Physical activity can help improve the quality of sleep, leading to better overall health.
- Increased Energy: Regular exercise can help boost energy levels, making individuals more productive and alert.

In addition to physical benefits, sport also has numerous mental benefits, including:

4. Reducing Stress: Exercise has been shown to reduce stress levels and improve overall mental health.
5. Improving Mood: Physical activity can help release endorphins, which are natural mood boosters that can help reduce symptoms of depression and anxiety.
6. Increasing Self-Esteem: Regular participation in sports can help improve self-esteem and confidence, leading to a more positive self-image.
7. Improving cognitive function: Physical activity and sport help to improve cognitive functioning: memory, work efficiency.

3.2. Sport and physical activity as a tool for social inclusion

Physical activity and sport have the power to bring people together and promote social inclusion. It provides a platform for individuals from different backgrounds to come

together and share a common interest. Some of the ways in which sport can be used as a tool for social inclusion include:

- Breaking Down Barriers: Sport can help break down social barriers by providing a common ground for individuals from different backgrounds to come together.
- Promoting Diversity: Sport can help promote diversity by encouraging individuals from different cultures and backgrounds to participate.
- Building Community: Sport can help build a sense of community by providing opportunities for individuals to come together and work towards a common goal.

3.3. Physical activity, sport and the Development of Social Skills

Sport and physical activity can also play a significant role in the development of social skills. It provides opportunities for individuals to learn important social skills such as teamwork, communication, and leadership. Some of the ways in which sport can help develop social skills include:

- Teamwork: Sport provides opportunities for individuals to work together towards a common goal, helping to develop teamwork skills.
- Communication: Sport requires effective communication between team members, helping to develop communication skills.

- Leadership: Sport provides opportunities for individuals to take on leadership roles, helping to develop leadership skills.

In conclusion, sport is an essential aspect of human life that provides numerous physical and mental benefits. It can also be used as a tool for social inclusion and the development of social skills. By promoting the importance of sport, we can help individuals lead healthier, happier, and more fulfilling lives.

3.4. The role of Sport: new perspectives of compensation for SLD

The world of SLD is described through different and specific characteristics and, at the same time, defined and recognized through the use of compensatory tools that generally accompany and characterize the educational and educational life of subjects who present this type of problem. Learning disorders are in fact defined as a difficulty in acquiring some particular skills, which do not allow complete autonomy in learning.

The compensatory tools, generally used as study support, are mediators who, in the process of building knowledge, due to an ineffective autonomy of certain basic skills, play a significant and decisive role for the individual with SLD for his/her educational path and learning.

These tools guide the subject in operations involving some specific difficulties, allowing him to express his skills in the highest and most effective way possible. The compensatory tools therefore act as support, with the aim of limiting the obstacles linked to a specific condition, providing a requirement of parity and equality.

The problems of SLD, however, are not limited to difficulties linked exclusively to the field of education and learning, rather, these subjects sometimes present critical issues linked to relational, emotional and social aspects which need, in the same way, to be compensated and balanced, in order to support the subject as a whole.

In the area of learning disorders, in fact, particular and peculiar attributes have been detected and highlighted that characterize and distinguish subjects with SLD, such as perceptual-motor alterations, emotional difficulties, behavioral problems, attention disorders and difficulties in social and relational skills, often associated with the emotional and interpersonal area (Mitchell, 2008). From all this it emerges that these subjects, apart from the characteristics of the disorder, show a general profile in which elements related to a particular and specific socio-emotional condition are present and involved. Therefore, the entire issue moves on a dual directive, on the one hand there is the typicality of the disorder, on the other the associated aspects, which involve both a personal and social sphere.

In this sense, the need for a broader and more specific educational perspective for SLD is outlined, an educational structure that can include a global vision that includes both the evaluation of the clinical aspect of the disorder and the related psychological and behavioral consequences. Therefore, if on the one hand the aspects that we can define as clinical of SLD must be identified, which allow us to recognize and define the presence, typicality and severity of the disorder, such as Dyslexia or Dyscalculia, on the other hand, other aspects must be stigmatized, such as emotional difficulties and problems in social skills, which although affecting a different area, still end up involving aspects of the subject's global balance. The key aspect that therefore emerges from the entire issue is the need to address the problem of SLD through an intervention that concretely considers the existence of the emotional, relational and communicational aspects by resorting to additional educational tools capable of addressing, in parallel to the canonical ones, the topic as a whole.

In this dynamic it would be legitimate to resort to a tool and/or a model that can support, or rather compensate, the existence of the different aspects present in SLD, recreating a methodology that leads towards an expansion of the training and pedagogical intervention, with the aim of supporting and supporting the subject in its complexity. In this sense we must ask ourselves how, and with what means, it is

possible to broaden the spectrum of intervention and extend the idea of compensation to a different design and implementation.

If on the one hand we consider the complex reality of SLD, and on the other we examine the general characteristics of sport, it is certainly plausible to identify the latter as a possible and probably effective compensation tool, used as a substantial element for a training intervention methodology complete and global.

Sporting activity represents an essential component for the physical, psychological and educational development of the individual. The practice of constant and planned physical exercise is able to improve the subject's mental well-being and stimulate potential and attitudes that are crucial for his personal and relational growth (Alfermann & Stoll, 2000). Motor activity is, therefore, capable of impacting the behavioral perspective of the individual, as it is capable of directing his organizational strategies towards the intended purpose and goal.

Sport teaches one to objectively evaluate one's limits and to recognize one's abilities and potential, allowing the individual to face difficulties with greater awareness and greater balance. In other words, taking care of one's physical and psychological well-being through sport allows for better management of problems by supporting the individual along the evolutionary path.

The above constitutes a conceptual framework that fully justifies the use of sport as a tool and operational support in the field of Specific Learning Disorders since it can undeniably represent an idea of support that looks at the globality of the subject, therefore applicable in different fields and with different modalities. In essence, it can be stated that sport, considering its prerogatives, can contribute to supporting a vast range of behavioral and psychological aspects, fundamental for the correct development of the individual.

Sports activity, due to these characteristics, therefore presents itself as the ideal candidate to resort to in planning and planning effective and constructive compensation.

3.5. Conclusion

The world of sport represents a particularly important tool for individuals with Specific Learning Disorders as it helps to improve skills, strategies and capabilities to cope with

their developmental and educational path and any conditions perceived as complex and problematic.

Sport can therefore be identified and recognized as a compensatory element that supports and supports the subject towards growth paths made of autonomy, independence, self-determination and awareness. Practicing a sport allows you to identify, explore and rediscover your abilities, to redefine them and gradually build an adequate and effective self-image.

Practicing sports increases and strengthens communicative, emotional and relational skills, positively influencing the ways in which an individual perceives and governs their relationships and their evolutionary path, increasing the awareness of possessing a greater ability to manage different contexts and circumstances. All this is also consolidated by the ability of sport to transfer specific skills and abilities, the mastery of which translates into greater certainty and control of one's means. Sport therefore represents the possibility and opportunity for every individual with SLD to recognize themselves through a vision and a dimension that is more in line with their value and abilities.

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4. Dyslexia and Sport: Challenges, methodologies, and success stories

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This chapter will explain the cognitive and motor challenges experienced by children and adolescents who show signs of dyslexia. The difficulties in both individual sports and team sports are discussed in depth, as well as the main risk factors shown according to age are detailed. At the end of the chapter, cases of famous athletes who have overcome their dyslexia problems and have triumphed in sport are shown.

Aims:

- Provide sports and physical activity professionals with knowledge about how dyslexia can influence the learning and development of a sport.
- Know the difficulties inherent to dyslexia and how neurological alterations affect sports development.
- Identify the main cognitive and motor challenges that affect the practice of physical and sports activity.
- Determine the motor alarm factors of dyslexia according to age.
- Show success stories of athletes who, with dyslexia, have overcome their difficulties and have shown great success in their sport.

4.1. Specific challenges for children and adolescents with dyslexia in sport.

4.1.1. Cognitive challenge

Children and adolescents with dyslexia can face particular challenges in the sporting environment, which, although often unnoticed, can significantly affect their overall wellbeing and participation. Dyslexia, a neuro-biological condition that affects reading,

writing and language processing, can manifest specific obstacles in the context of physical activities.

One of the main challenges lies in the instructions and communication inherent in sports. People with dyslexia may have difficulty processing verbal information quickly, which can make it difficult to follow instructions from coaches or understand game strategies. Clear and concise communication becomes crucial, and coaches must be aware of different learning styles to ensure that all team members, including those with dyslexia, understand instructions effectively.

Another challenge relates to reading and interpreting visual cues during sports. Dyslexia can affect visual perception, making it difficult for individuals to process and respond quickly to visual stimuli. In team sports, where quick decision-making based on visual information is vital, this can affect the ability of a child with dyslexia to perform successfully in the game. Coaches may need to implement alternative methods of conveying information or provide additional support to improve visual processing skills.

In addition, social dynamics in sports settings can be challenging for some children and adolescents with dyslexia. Peer interactions, team collaboration and the pressure of competition may intensify feelings of self-doubt or isolation. Coaches and teammates play a critical role in fostering an inclusive and supportive environment, helping individuals with dyslexia build confidence and establish positive social connections.

Adapting training methods to accommodate different learning preferences is essential. Visual aids, hands-on demonstrations and a multi-sensory approach can enhance the learning experience for people with dyslexia in sport. In addition, coaches should encourage open communication, creating a safe space for athletes to express their needs and seek assistance.

In conclusion, addressing the specific challenges faced by children and adolescents with dyslexia in sport requires a multifaceted approach. From adapted communication strategies to inclusive social environments and flexible coaching techniques, recognising and accommodating the unique needs of individuals with dyslexia can empower them to fully participate and thrive in the world of sport.

The approach to adolescent dyslexia in individual and team sports can differ significantly due to the specific demands of each sporting context. Some key distinctions are highlighted here:

Individual Sports:

- **Emphasis on Autonomy:** In individual sports, such as swimming, athletics or tennis, the adolescent with dyslexia can have more autonomy in the execution of skills. This allows for a more personalized approach in developing techniques and strategies tailored to their specific needs.
- **Less Immediate Social Pressure:** By not relying directly on interaction with teammates, the adolescent may experience less immediate social pressure, which could be beneficial for those who face challenges in social interactions.

- **Greater Focus on Individual Skills:** Coaches can focus more on honing individual skills, adapting to the learning pace of the adolescent with dyslexia and providing personalized feedback.

Collective Sports:

- **Importance of Communication:** In team sports such as football, basketball or hockey, constant communication with teammates is essential. Adolescents with dyslexia may face challenges in verbal processing speed, so adapting communication strategies is key.
- **Teamwork and Collaboration:** These sports encourage teamwork and collaboration, which can be beneficial to an adolescent's social and emotional development. However, it can also present challenges if dyslexia affects the ability to quickly understand game tactics.
- **Social Pressure and Interpersonal Relationships:** Social dynamics are more intense in team sports, and adolescents with dyslexia may face additional pressures to conform to team social norms. The sensitivity of coaches and teammates in this regard is essential.

In both cases, open communication between coaches, parents and adolescents is crucial to understand individual needs and adapt the sport environment accordingly. In addition, multi-sensory teaching strategies, emotional support and the promotion of self-confidence are essential, regardless of the type of sport played.

4.1.2. Motor challenge

Motor skills are made up of different types of motor abilities: perceptual-motor abilities, physical-motor abilities, and socio-motor abilities. Children who present symptoms of dyslexia will mainly show alterations in perceptual-motor and socio-motor abilities.

- **Perceptive-motor abilities**

In this area we find the notion of the body schema altered. The body schema is understood as the global and segmental perception of our body. This perception will be reflected in the control of postural tone and the balance of the individual on himself, both dynamic and static. Balance is understood as the ability to counteract external forces in order to maintain the desired posture.

Another notion present in this area that may be affected is spatiality. Within spatiality we find spatial orientation and laterality. The spatial notion refers to the perception of the situation of our body in a specific space, that is, being able to locate oneself and move through space, orient oneself, take multiple directions, analyze situations and represent them. To develop this skill it will be necessary to have previously developed the notions of right, left, up, down, in front and behind. Likewise, within spatiality, laterality becomes relevant, understood as the lateral preference for the use of one of the sides of the body, hand, foot and eye preferably. Without good development of laterality, it will be very difficult for a child to develop correct reading or writing.

The third last notion refers to temporality, and it will be affected by orientation in time and rhythm. The organization and order in sequencing could be affected; and to the notion of interval and duration. Likewise, the rhythm could also be affected and is relevant to the possibility of reading development.

Spatial orientation and temporality will influence both eye-hand coordination (grasp) and general-dynamic coordination (locomotion). Coordination refers to the ability to precisely regulate the intervention of one's own body in the execution of the joint and necessary action according to the predetermined motor idea. Coordination is therefore essential to obtain good control and adjustment of the motor act since it assumes a fundamental role in the consolidation of the dominance of laterality and is a factor inherent to the space-time structuring.

- **Socio-motor abilities:**

They are defined as “interactive and communicative phenomena of the child, which prepare him in his projective dimension. Expression activities and collective play. It is established that within this type of capacity is bodily expression. In this sense, the emotional relationships that the child develops with the environment and with the rest of the peers play a determining role in the development of the body schema.

4.2. Warning factors for dyslexia motor skills according to age

In addition to the warning signs of dyslexia, some common elements may appear, which at an early age would not suggest a possible dyslexion, because they affect other areas, but which could be observed altered in children from 2 to 6 years old.

- Immaturity can be seen in the knowledge of the parts of his body. The child confuses the location of body parts.
- Physical and general developmental immaturity with global maturational delay that affects all school areas.
- Spatial and temporal notions could be altered, and often the child could confuse right with left, and not orient himself correctly in time.
- They may be clumsy when running, jumping and skipping.
- Difficulties in static and dynamic balance.
- Immaturity at the level of fine motor skills.
- Difficulty showing lateral dominance and presence of crossed laterality.
- They usually present coordination problems.

- Has low body tone, or too much body tone (such as muscle stiffness). This lack of correct tone does not help him control his movements or his throws. The corporeal reference is practically nil.
- Walks in a disorderly manner and without rhythm or balance.

At ages 7 to 11, the age at which dyslexia should have already been diagnosed, the following warning signs may appear:

- They show poor motor coordination, are easily confused and may be more prone to accidents.
- Confuse right with left.
- Difficulty performing certain movements (ride a bicycle, jump rope, high jump, kick a ball, etc.).

From 12 years of age and older, if it has not been diagnosed, the prognosis of progress and evolution is not considered difficult. In addition to the alarms described above, the following can also be found:

- Shows serious difficulties
- Problems in distance perception.
- Problems with rhythm and musical languages.

In general, there are other skills that can also be affected, such as learning and mastering new games; applying learned skills from one situation to another, navigating space and direction, or organizing and managing time. In this sense, children with symptoms of dyslexia may present difficulties in the motor area such as: poor coordination and poor ease in learning games with ball and equipment, which will make the development of children's ability to cope more complex. to sports tasks, resulting in less than successful results, significantly falling out of step with the group. Likewise, the present problems of spatial orientation, right and left, up and down, which are seen in the confusion of different letters p-q, b-d, or others, will also be extrapolated to the sports space.

In this sense, at the motor level, psychomotor education will be considered of special relevance through work on the alteration of laterality, body schema and spatio-temporal orientation, through psychomotor activities.

Likewise, work should be done on perceptual training, trying to improve visual-motor abilities.

Figure 1. Connect the Spots: Training Teachers to Empower Dyslexic Children. video created by Made by Dyslexia and published on youtube.

4.3. Successful Cases

Dyslexia, a learning disorder affecting reading, writing, and spelling, hasn't been an insurmountable obstacle for numerous elite athletes worldwide. From basketball legends to boxing icons and Olympic champions, many athletes have shown that dyslexia does not define their limits or determine their destiny. These success stories not only inspire but also challenge stereotypes and promote a deeper understanding of diversity in the world of sports.

Figures like Magic Johnson, Muhammad Ali, Greg Louganis, and Caitlyn Jenner have overcome academic challenges and reached the pinnacle of their respective sports, inspiring millions worldwide with their determination and achievements. Through basketball, boxing, diving, track and field, and other sports, these athletes have demonstrated that dyslexia is not a barrier to athletic greatness.

In this exploration of success stories in athletes with dyslexia, we not only celebrate their achievements on the field but also recognize the value of their example in challenging perceptions and paving the way for greater inclusion and understanding in society.

Figure 2. Top Ten Dyslexic Sports Personalities. Video created by The Codpast and published on youtube.

Below is a short list of top sportsmen and women with dyslexia who, far from dyslexia being a limiting factor for them in sport, have managed to use sport as a tool to improve every day, to the point of achieving great sporting success.

- **Magic Johnson (Basketball):** Basketball legend Magic Johnson has spoken about his struggle with dyslexia during his career.
- **Muhammad Ali (Boxing):** The late Muhammad Ali, considered one of the greatest boxers of all time, also had dyslexia.
- **Lewis Hamilton (F1):** A prominent Formula 1 driver who has spoken openly about his experience with dyslexia.
- **Lisa Leslie (Basketball):** American basketball player, a member of the WNBA Hall of Fame, who has publicly spoken about her experience with dyslexia and her path to success in basketball.
- **Greg Louganis (Diving):** Olympic diving gold medallist Greg Louganis has spoken about his challenges with dyslexia.
- **Ángela Torres (Golf)**: Spanish golfer who has competed in various international tournaments, including the Ladies European Tour, despite facing challenges associated with dyslexia.
- **Bruce Jenner (Track and Field/Decathlon):** Before his transition to Caitlyn Jenner, Olympic decathlon gold medalist Bruce Jenner revealed that he had dyslexia.
- **Tim Tebow (Football and Baseball):** Tim Tebow, known for his career in football and baseball, has shared his experience with dyslexia.

- **Scott Hamilton (Figure Skating):** Olympic figure skating champion Scott Hamilton talked about how dyslexia affected his upbringing and how he overcame those challenges.
- **Wendy Smith (Rugby):** Australian rugby player who has represented her country at the international level, demonstrating that dyslexia is not a barrier to success in sports.
- **Duncan Goodhew (Swimming):** British Olympic gold medal-winning swimmer Duncan Goodhew has spoken openly about his dyslexia.

In terms of a more detailed story, we could explore the life and career of Magic Johnson. Despite facing academic difficulties due to his dyslexia, Magic discovered his passion for basketball from a young age. As he grew up, his skill on the court led him to excel in high school and eventually earn a scholarship to play at Michigan State University.

Although Magic struggled with reading and writing, his basketball talent led him to be selected first overall in the 1979 NBA Draft by the Los Angeles Lakers. During his NBA career, Magic became a basketball icon, winning multiple championships and awards, including the NBA Most Valuable Player (MVP) award several times.

Off the court, Magic has been a successful entrepreneur and advocate for various causes, including HIV/AIDS awareness, after publicly announcing his diagnosis in 1991. His story is an inspiring testament to how determination and talent can overcome the challenges of dyslexia and lead to success in multiple areas of life.

Magic Johnson's experience with sports, triggered a series of benefits that helped mitigate the challenges associated with his dyslexia. Here are some specific ways in which sports were beneficial for him:

1. **Development of self-esteem:** Magic found in basketball an activity where he could excel and feel valued. As he improved his skills in the sport, his self-esteem strengthened. This sense of achievement countered the challenges he faced in the academic realm due to his dyslexia, providing him with a source of confidence and personal pride.
2. **Fostering discipline and determination:** Sports require constant dedication and rigorous discipline to achieve success. Magic learned to set goals, work

hard, and overcome obstacles on the path to athletic excellence. These skills are also transferable to other aspects of life, including managing dyslexia and its associated challenges.

3. **Channeling energy:** Sports provided Magic with a positive outlet to channel his energy and stay focused. Participating in basketball allowed him to release tensions and emotions in a constructive manner, contributing to his overall emotional and mental well-being.

4. **Development of social skills:** Through basketball, Magic was able to develop meaningful relationships with teammates and coaches. Teamwork, effective communication, and cooperation are fundamental elements in sports, and Magic had the opportunity to practice and improve these social skills in a structured sports environment.

5. **Promotion of mental health:** Regular physical activity associated with basketball practice also had benefits for Magic's mental health. Exercise helps reduce stress, improve mood, and increase concentration, which can be especially useful for people with dyslexia facing challenges related to attention and concentration.

In summary, basketball provided Magic Johnson with much more than just a successful sports career. It was a source of strength, a platform for personal growth, and a tool to overcome the challenges associated with his dyslexia. His story is an inspiring example of the transformative power of sports in the lives of people with learning difficulties.

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5. Strategies for Social Inclusion through Sport

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5.1. Introduction

The fifth chapter focuses on strategies that can be implemented to promote social inclusion through sport for children and adolescents with dyslexia. Adaptations in sports teaching and training that may facilitate these youth's participation in sports activities are discussed.

The importance of collaboration between education and sport professionals is highlighted. Communication and coordination between teachers, coaches and therapists are essential to provide comprehensive support to children with dyslexia. The training and awareness of adults involved in the lives of young people is fundamental.

Practical deficiencies, unfortunately increasingly found in the primary school student population, are always accompanied by low levels of mastery in terms of lateralization, balance management and generic eye-hand coordination (Crispiani, 2011). This statement, although strong in content and confirmed for years in scientific forums, seeks to highlight the connections between motor skills and Specific Learning Disorders (DSA). In fact, in the functional diagnosis of DSA, the in-depth evaluation of the disorder extends to other fundamental or complementary skills: perceptual, praxis, visuo-motor, attention and memory.

These signs, defined as early (Njiokiktjien & Chiarenza, 2008), in preschool age are indicators, especially in the presence of a positive family history, of the possible onset of DSA which sometimes then present themselves with co-morbidities both among the

different forms of SLD and with other conditions such as behavioral disorders (mood and anxiety) and/or ADHD.

5.2. Theoretical approach to the problem

Motor skills are linked to higher functions even if this is not always recognized as a real one-way pathway of the central nervous system. For example, the Balance-Model Treatment (Lorusso Lorusso, Parini, Bakker 2010) confirms that the ability to read (outcome) derives from the balance of skills between the right and left hemisphere (central level) and that its learning occurs in relation to development of some motor patterns (peripheral level) that constitute gross motor skills (walking on all fours, development of the laterality of a hand; Tresoldi & Vio, 2003). Furthermore, other scholars report that 'purposeful motor skills' interventions (peripheral level) can create a better circulation of information at a neuronal level on both cortical and subcortical interconnections (central level; Spezzi, 2017). Therefore, it is easy to apply other analogies whereby an imbalance between the activities of the two hemispheres (central level) would be the cause of dyslexia (outcomes at the peripheral or functional level).

In fact, following this theory, 3 types of dyslexia have been identified:

- perceptual (less active left hemisphere): reading is correct but slow;
- linguistic dyslexia (right hemisphere less active) reading is incorrect but rapid;
- mixed dyslexia (hemispheres not fully active): reading is both incorrect and slow.

On the basis of these beliefs, it can therefore be stated that the level of neuronal organization is at the same time a stimulus for accurate movement and a receptor for information coming from the outside which from time to time enriches it with feedback to perfect its schemes (bodily/motor and correction): motor actions are therefore considered essential in DSA improvement approaches (figure 1). In fact, coordinated actions involve over a dozen functions, many of which activate the very skills that are a prerequisite for the processes of reading-writing and carrying out mathematical operations, activating different brain districts which in turn induce the birth of new ones. neural connections.

To confirm what was previously stated, various analogies can be highlighted between linguistic competence and motor competence (Lodi, Barbieri, Seghi, & Buiani 2014) which in fact create different synergies (speaking the body moves, reading uses visual-motor coordination while moving non-verbal language and meanings are evoked):

– temporal sequentiality

– achieving a goal

– use of a 'vocabulary'

– intervention of Broca's area

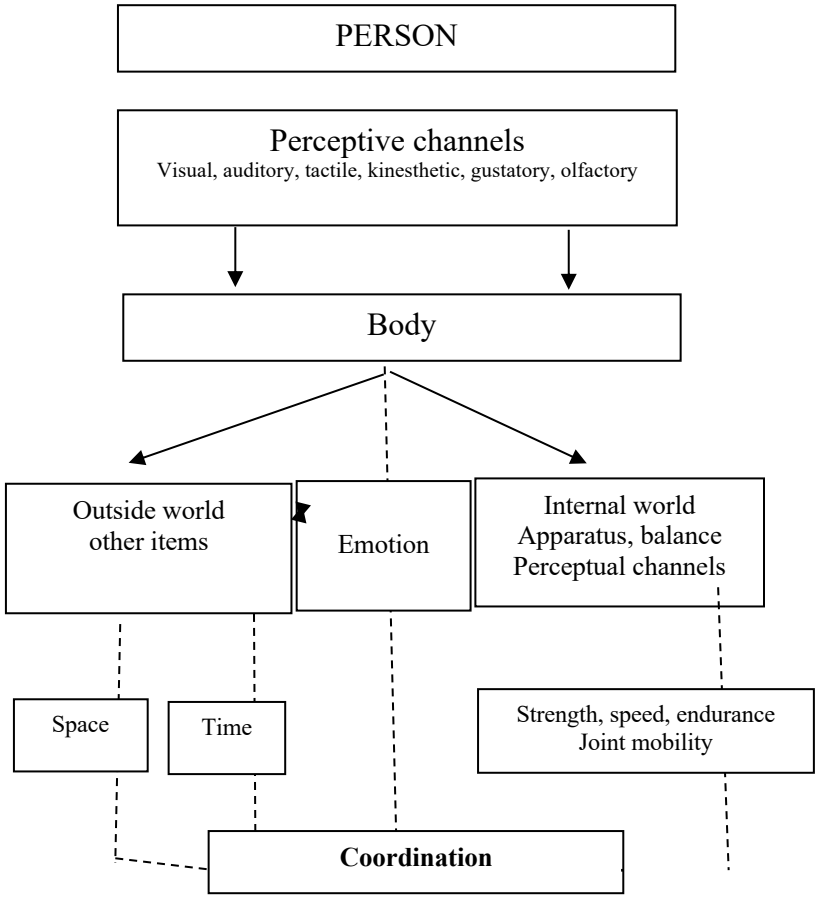
– increase induced by observation and practice

– increase in autonomy/safety of action in the environment

– increase in self-esteem

– synergy of different brain districts with large synaptic flows

Figure 1: Interactions between perception and action in humans



Mantovani & Albanesi, 1997

We can therefore say that moving is planning an action in the form of a finalized sequential organization for which it seems plausible that similar procedural functions can improve the ability to deal with linguistic or mathematical tasks as they are located in brain areas designated for the same purpose: such as the of Broca better defined as the area of putting in order (Craighero, 2014). In fact, thinking or observing a movement means structuring the procedural thought of the actions necessary to achieve a goal. Every movement; from pulling a zipper to taking a bottle out of the fridge, a specific procedure requires that muscle bundles contract and decontract in the exact sequence depending on the goal to be pursued using a motor-conceptual axis that involves mastery of the bodily self and temporal orientation. It is therefore no

coincidence that mirror neurons are predominantly located in the language area and that they are activated when you think about a movement or see it done by others.

5.3. Purpose

The aim of this work was to verify the hypothesis according to which learning difficulties are intrinsically linked to praxis-motor disorganization. In fact, the verification of the simultaneous presence of small or important movement *disharmonies* and DSA can be evidence that the child's body is governed by a body and motor pattern (Crispiani, 2011) that needs to be reset. From this it could be deduced that by re-constructing these patterns it is possible to set up effective (and early) forms of personalized enabling.

Subjects

12 students (8-13 years) diagnosed with SLD were freely recruited. After an individual interview with the parents of the minors, informed consent was obtained to involve the children in the experimentation. No procedures involved invasive forms of analysis and everyone was left free to interrupt the process at any time.

Instruments

Some tests were administered (see Annex A) to identify the motor profile (outcome of the body and motor scheme) of each participant in relation to oculo-manual skills, rhythmic coordination with jumps, translocations, throws, balance and to manual, ocular and breech lateralization.

Three tests for measuring dyscalculia (Biancardi & Nicoletti, 2004), dyslexia/dysorthographia/reading (Sartori, Job, & Tressoldi 1995; Cornoldi & Colpo, 1998) and orthographic disorders (Angelelli et al., 2008) were administered. In particular, table 1 shows the items that were actually taken into consideration for each individual test.

At the same time, a motor exercise table has been prepared to facilitate the children's domestic activity and record any progress achieved over time (see Annex B).

Procedure

After an interview and relative informed consent from the parents, 12 pupils were monitored with the tests (Table 1), previously described, for the motor level and for the identification of SLD. Subsequently, the children attended a cycle of 20 sessions (90 minutes each) of physical-sports activity conducted by a motor learning expert according to the key criteria already set out in the "theoretical approach to the problem" paragraph. Furthermore, all the students, in agreement and with the supervision of the family, performed the motor tests indicated in the guide for home exercises.

Table 1. Battery of tests administered

Test	Name	Items	Description
Calculation	Battery for Developmental dyscalculia (BDd)	*Count 100 to 1*	the child must count out loud from 100 to 1 as fast as he can and making as few errors as possible. In this test, time and errors are counted (e.g. omissions of the ten, long hesitation, change of direction, adding numbers)
		Reading of numbers	the child must read a list of numbers aloud as quickly as he can and making as few errors as possible. In this test the time and number of correct answers are counted
		Multiplication tables	the child must say the times table of four and seven out loud, without hesitation longer than two seconds. In this test the number of correct answers is counted
		Multiplications in mind	the child, listening to the single-digit multiplication read aloud by the therapist, must give the answer within two seconds. Sixteen multiplications are read. In this test the number of correct answers is counted

		Additions and subtractions	*in mind within the tenth* the child, listening to the addition or subtraction within the ten read aloud by the therapist, must give the answer within two seconds
		Mental addition and subtraction over tens	the child, listening to the addition or subtraction over the ten read aloud by the therapist, must give the answer within two seconds
Reading	Dyslexia and developmental dysorthography	*Test 4*	the child must read four lists of words aloud. In this test, the time and number of errors for each list are counted
	Dyslexia: correctness and speed	*Reading*	the child must read aloud a passage suitable for the class attended. In this test the time and number of errors are counted
Writing	Diagnosis of spelling disorders in developmental age (DDA)	*Writing*	the child must write on a white sheet of paper a list of fifty-four words dictated by the therapist. In this test, spelling errors made are counted.

Modulation of motor intervention: a real example

Over 50% of the children during the initial motor skills test highlighted uncertainty in choosing the dominant eye. Episodes in which they alternated left and right or even brought the crosshair to the center of the face changed the convergent thinking that considered the lack of manual lateralization as the only prevalent cause of forms of dyslexia. A global approach attempted to draw indications regarding their neuro-motor functioning precisely through the "story of their movements". For example, in some, the left eye prevailed over the right without guaranteeing adequate stereo vision, so much so that they rotated the head to observe from a defined "3/4" vision.

This could, therefore, mean:

– the right hemisphere is overstimulated

– the process of hemispheric dominance is still dysfunctional

– this trend will cause further interference in the management of incoming visual signals.

The motor intervention was therefore modulated with activities linked to the sporting activity of Basketball (and the more preparatory forms of Go-Back); to paths and progress with the rope according to the principle that every single execution would "nourish" the CNS. remodulating its structures and synaptic connections.

Given the awareness that visuo-motor dysfunctions can compromise reading and writing skills, an attempt was made to stimulate accurate (and not casual) use of the aiming eye through the repetitive use of blowguns, targets, adhesive darts and games for use at home including 'rubber band clip guns'.

5.4. Results

After 5 months, the repetition of the proposed tests resulted in a significant improvement in the monitored functions: calculation, reading, writing and motor skills. In fact, examining the totality of the items (on all students) proposed in individual functions the calculation capabilities improved by 57%; writing by 55%, reading by 60% and motor actions by 52%.

It remains useful to clarify that in terms of adherence to physical practice, frequency in guided group work has always been high while individual and spontaneous participation in domestic work with the reference card has been, at most, regular.

5.5 Discussion

The hypothesis underlying the pilot project was that certified children with DSA can achieve significant improvements through constant and continuous training according to a criterion of targeted motor stimulation. That is, by adequately stimulating the key functions of lateralization, global and oculo-manual coordination, and space-time orientation, we influence not only the neural interconnections of the motor areas (areas 4 and 6) but also all the others connected to them thanks to the association stations of the brain that regulate the exchange of information and their interpretation (Edelman, 2004). In fact, according to Piaget's definitions (1967), the development of thought occurs through stages ranging from bodily and motor perception to ideo-motor

abstraction, which allows us to proceed from concrete to abstract thought through manipulation and experientiality.

This process, certainly difficult to implement except with modern functional magnetic resonance techniques, creates the mapping of a knowledge cataloging system based on a logical order and a space/time orientation. In fact, as claimed by Quercia (2008) postural anomalies, dyspraxias and perceptual alterations are intertwined and connected to SLD (Mahakud, 2013) and can be positively influenced by 15 minutes of cognitive-motor actions that have the aim of 'enabling ', in fact, perception, motor skills, reading, writing, understanding and calculation (Crispiani, 2001).

It is, in fact, the authors' belief that the individual processes of reading, writing and calculation are analogous to those of motor actions planned in a context where cerebral dominance, eye-hand coordination, the timing of neuromuscular activation are modulated common elements only by different intensities depending on the outgoing practices.

Their precariousness can lead to a lack of recognition of characters, to the difficulty of memorizing their sequence, to a slowdown and disorder in outcome processes: what precisely happens in DSA. Reordering the coordination structures of dyslateral and/or dyspraxic subjects therefore corresponds to offering them an opportunity for neuro-motor improvement (perceptual and ideational). The children in our sample, during the period dedicated to motor skills, despite not following any speech therapy treatment, made progress in the areas underlying schoolwork thanks to input mediated by physical exercise which had neuronal plasticity as its "target organ" (Craighero, 2014): "regenerative" phenomenon discovered years ago by Merzenick which describes the brain's ability to increase the number of synaptic connections following the completion of a performance. This allows you to acquire or refine skills that can be used whenever necessary: as in the case of writing and reading which require visuo-motor skills.

This closely links movement to learning processes and is believed to be a key factor to be increased in a playful way within a non-competitive group where the pleasure of testing becomes a carrier for increasing the mastery of one's executive skills.

5.6. Collaboration between education and sports professionals

SLDs affect reading, writing and calculation skills. People with SLDs often have difficulty memorising and manipulating the information they receive from the outside world. This difficulty has been traced to several possible underlying causes, which we will quickly list: poor phonological awareness (Bradley and Bryant, 1983), visual-perceptual difficulties with involvement of the magnocellular pathway (Best and Demb, 1999), limitations in latency in visible persistence and in the transition from sensory to short-term memory (Stanley, 1975), potential deficits in short-term visual signal processing (Di Lollo, Hanson and McIntyre, 1983), poor competence in grapheme-phoneme conversion processes (Golden and Zenhausern, 1983), limitations in asymmetric crowding (Geiger and Lettvin, 1987), attentional deficits (Stein and Walsh, 1997; Steinman, Steinman and Garzia, Garzia, 1998), spatial attention deficits (Facoetti and Turatto, 2000; Facoetti, Paginoni and Lo Russo, 2000; Facoetti and Molteni, 2001), eye movement deficits (Biscaldi, Fischer and Aiple, 1994; Biscaldi, Fischer and Hartnegg, 2000); for more details see (Benso F., Stella G, Zanzurino G, 2005, la dyslexia evolutiva Vol. 2, No. 2, May 2005). The list given allows us both to understand the complexity of the SLDs and the number and heterogeneity of areas possibly affected by the disorder.

Not only are academic skills (such as reading writing and computation) affected, but also several other cognitive areas which can impact the everyday life of a person. Several strands of research have allowed us to discard some of these hypotheses and validate others that are considered more reliable and, above all, more representative of the majority of people with a SLD. For the purposes of this research, one consideration might be deemed more important than the others: which areas or components of SLDs most affect a person in performing a specific sport activity? The heterogeneity of SLD profiles makes it at least imprudent to formulate a single underlying cause and consequently a single, homologous and generalisable approach.

We will be able, in a cautious and exploratory way, to hypothesise a greater relevance of mnemonic, attentional and visuoperceptive factors in the practice of major sports activities, including both individual and group sports.

With reference to memory and attention, we will go on to emphasise how these specific cognitive functions constantly intervene in almost all activities performed by people. A deficit in these areas (which for the reasons just stated we could call global) may lead to limitations, more or less pronounced, in sports activities. When we talk about memory,

we are referring to a specific area of memory and not to memory understood in the total sense. Specifically, research has highlighted the crucial role of verbal short-term memory in the genesis and development of SLDs. In fact, it is well known that working memory is, at least in the early stages of schooling, particularly important both in the process of reading, which requires recognising graphic signs, associating them with corresponding sounds, and composing words, and in all other trans-coding processes (e.g., stable memorisation and subsequent conversion of the word number into the number symbol on the sheet). For people with Dyslexia, such processes hardly reach full and complete automation, but require constant and over many years (sometimes a lifetime) greater effort as well as greater expenditure of time.

As already indicated, both working memory and attention are crucial in our daily lives. Only through their full efficiency are we able to process new information and retain it stably and safely for future use. The information processed is not only related to the school environment but also to different contexts such as in sports practice due to the multiple deliveries/instructions that will have to be learned in the initiation stages of any sports activity. Difficulties in the visual-perceptual areas also relate to sports, especially in relation to the need for high efficiency in coordination skills and complex movements.

Given these difficulties, which are not always exclusively scholastic, it also becomes possible to relapse/reverse the difficulty on the psychological side as well. In several cases, people with ASD may develop difficulties in socialisation processes. To counteract and limit the onset of such psychological repercussions, sports could assume a crucial protective role, being by its very nature, an activity with multiple benefits both on the physical and mental level. It helps to improve mood, facilitate socialisation skills, decrease stress, increase physical endurance and develop overall better resilience.

Of course, in order for these benefits to be realised it will be necessary to approach sports in the correct way, taking into account the characteristics of the person with SLD and the possible difficulties related to the person's functional and psychological profile. A wrong approach, in addition to not being beneficial, would further risk confirming the perception of lack of effectiveness already experienced within the school setting, which may further risk undermining the harmonious development of the future adult.

As well as what has already been undertaken over the past 20 to 30 years in the school setting, recommendations for the implementation of good practices for coaches should

also be included in the sports context. On a practical-exemplifying level from what emerges from the questions of the questionnaire, used to obtain information in the field of DSA and sports, (described at the end of this text) regarding the difficulties experienced by children, we provide some recommendations on two different areas of intervention: functional and emotional/relational. For the functional part, the following essential actions are recommended:

● Emphasis is placed on not overloading the verbal working memory with a lot of information when explaining the exercise, but explaining it slowly, one step at a time, and helping with practical examples or directly showing the exercise along with the oral explanation. Once explained, enclosing this exercise comprehensively within a map representing it or a bulleted list (transmodular multisensory learning).

● A sequential type of verbal theoretical explanation of the exercise, i.e., illustrating the underlying theory with simple instructions that follow one another cumulatively until the stages of the exercise are reached globally.

● A more useful way (also related to the specific learning style) might be to show the exercise through hands-on action of the trainer performing the exercise, pictures/videos, and then listen to an oral explanation. It is known that motor-type learning can be best learned through instructions that are also motor-based and only later, supported by sequential verbalisation of the exercise (as per the previous point).

● It might be helpful to keep the individual's names both behind the tunic and in front to encourage mnestic association or fast retrieval of information during practice/games, since reaction and execution time are often critical.

● Using multisensory teaching techniques as previously specified.

● Adaptation of rules: the child must be helped to understand and follow the rules of the sport, which can be simplified or modified to suit his or her needs. For example, visual or auditory tools can be used to facilitate communication, times or distances can be reduced, and different materials or equipment can be used.

● Working memory training is crucial; the child must be stimulated to exercise his working memory, which is the ability to store and manipulate information in the short term. Working memory is important for performing cognitive and motor tasks, such as mental calculation, problem solving, and movement coordination. Using games or exercises that require remembering sequences, colours, numbers, words, steps,

movements, and actions to be performed in conjunction with a specific auditory stimulus (e.g., I ring the bell and run to touch a specific object before shooting at the goal or I say the word green and the individual knows it is associated with doing 3 turns on themselves and kicking the ball with their left leg.

Likewise, it emerged that in sports, as in the school context, a fundamental role should be attributed to relational factors between coach and athlete and between teammates. Specifically, the data highlight the importance of certain elements that we will briefly list:

● Creating a positive and welcoming learning environment where children can feel free to challenge themselves and even make mistakes without fear of negative repercussions.

● Use positive reinforcement.

● Remember that fun and positive experiences promote learning so it can be helpful to use relationships, humour and creativity to keep kids' attention active and increase motivation during sports.

● Set realistic goals (i.e., calibrated to the specific skill achieved by the individual); success predisposes to task repetition by promoting greater efficiency.

● Use structured, repetitive teaching techniques to facilitate learning.

● Provide clear, concise and focused feedback on the task without overloading them with too many explanations during the physical act; such reflections are best performed at a later time when the individual can fully engage in listening with all their energy.

● Encourage sharing of the singularities of each athlete from the beginning, so as to avoid difficult situations related to one's own characteristics.

● Motivate each individual high-flyer for what they have done on the field.

The support of the environment has a power that should not be underestimated; the child must be encouraged and supported by parents, teachers, coaches, and peers. The environment should be welcoming, respectful, and inclusive, and should value the individual’s progress and strengths, without emphasising mistakes or difficulties.

Sport is one of the most popular and valued activities in the world, both as competitive and recreational play. Sport involves millions of people of all ages, cultures, religions, and nationalities, and is, therefore, a powerful tool for social integration. However, sport also involves challenges and difficulties, both individually and collectively, which require the intervention of qualified professionals to address them.

Among these, the psychologist plays a key role, as they are responsible for promoting the psychological well-being of athletes, coaches, managers and fans, as well as preventing and treating disorders and problems that may arise in the sports context due to specific individual or relational difficulties. The psychologist also collaborates with other professionals, such as the physician, physiotherapist, nutritionist, and athletic trainer, to provide integrated and multidisciplinary care for athletes and their families. These guidelines aim to illustrate the importance of the role of the psychologist and other professionals in fostering the inclusion in sports of children with SLD, through an overview of the main issues, methodologies and experiences that characterise this area of intervention. What makes an environment inclusive is the sensitivity with which specific issues and situations are addressed. Therefore, it will be important to train the people who revolve around the individual’s sports life in order to provide them with the tools and awareness of these difficulties. This need and necessity were detected by the survey questionnaires administered to coaches (the questionnaires are described later), which showed an interest in learning more about the "world of dsa" with an awareness from many that they do not have adequate knowledge of it.

This manual aims to help spread a culture of healthy, inclusive and supportive sports. Some international research aimed at studying different possible developmental trajectories in people with ASD has revealed several possible scenarios. A fairly significant percentage of people tend to compensate for the specific difficulty, although there remains a lower efficiency and greater expenditure of attentional resources in tasks that require the use of the skills affected by the disorder. Outside the school context, there is also a tendency to choose professional outlets where it is possible for the person to exercise areas of full efficiency, a kind of implicit "escape" to islands of talent. Sport in such a sense goes to identify with such a place. Such an element becomes even more important and relevant in early developmental stages (adolescents and young adults) where even before future professions, possible personal success is

experienced. Success constitutes a major resource and developmental element for resilience and stress response activities.

The main purpose of the present research was to investigate the state of the art in the relationship between sports practice and SLD. The responses to our questionnaires allowed us to highlight the strengths but also the limitations that still exist in the sports world with respect to both knowledge and, more importantly, the most effective approach for these young athletes with different learning styles. In our opinion, the data we have collected still does not provide comprehensive information on proper practices. This deficiency can only be filled through subsequent field research, and as happened in the school world, through the joint efforts of coaches, parents and teachers. It is hoped that this can also be replicated in the sports world so as to create fruitful synergies between coaches, technicians, parents and young athletes. This will not only lead to the creation of effective operational models to achieve sports success, but will also help to organise sports practice awareness whilst taking into account the strengths and weaknesses of children with SLD so as to provide protection and harmonious development of the person.

5.7. Conclusions

Motor activity is essential in the child's physical, mental and emotional development. But it is also the foundational element on which to act to reorganize the functionality of those who experience scholastic difficulties.

The repetition of exercises and games carried out by children activated new sensorimotor circuits to strengthen space-time orientation, increase self-esteem (self-esteem) and praxis effectiveness (tonic regulation). This could (there were no instrumental measurements such as functional magnetic resonance imaging) have generated new synaptic traces that the CNS was able to "use" for other scholastic functions. The results obtained by the children are of great comfort in enriching the wealth of possibilities that teachers and families can have at their disposal to improve/compensate for the performance related to SLD. It would be appropriate, as early as possible, to focus on actions aimed at strengthening lateralization, eye-hand coordination and enriching sense-perception (muscle tonic regulation).

For this reason, it is a priority to dedicate ourselves to the training of primary and nursery school teachers so that they can, on the one hand, acquire that clinical eye

capable of grasping what can herald a potential learning difficulty, and on the other, be capable of proposing motor skills exercises and games that counteract the various forms of dyspraxia (Spezzi, 2015) until the use of teachers specialized in motor sciences in primary school is implemented.

Furthermore, collaboration between education and sport professionals is very important. Communication and coordination between teachers, coaches and therapists are essential to provide comprehensive support to children with dyslexia. The training and awareness of adults involved in the lives of young people is fundamental.

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ANNEX A

DETECTION OF MOTOR SKILLS

If he throws a ball to a teammate 9m away, he uses his arm right left If he throws a ball to a teammate 9m away, he keeps his foot forward right left
How many times does he perform hops on the spot with his feet together in a period of 15": _____ How many times does he jump on the spot with his feet apart in a period of 15" : _____
How many times does he jump on the spot with his feet together, throwing his arms out high: _____ How many times does he jump on the spot with his feet together, throwing his arms out high: _____
If you carry a ping-pong ball on a racket for 9m, how many times does it fall?? _____
How many times does he bounce a ping-pong ball off his racket before it drops? _____
Moving with lateral steps to knock down 2 pins placed at 9m; how long does it take: _____
If he kicks a ball 3 times to hit a mat (1x2 meters) located 6m away; uses the Right foot 1–2-3 / Left 1–2-3 times and hits it n: ____
If he looks through a hole with only one eye he does so with Right 1 – 2 – 3 / Left 1 – 2 – 3 times
Remaining balanced on a wooden block (4 x 6 x 12cm) for 20" how many times do you place the other foot on the ground: _____
If you throw a tennis ball 3 times as far as possible, use your right arm 1 – 2 – 3 times / left arm 1 – 2 – 3 times: to m: _____; to m: _____; to m: _____; Total: _____

Moving in quadrupedia (forward) how many seconds does it take to knock down a pin placed at 6 meters: _____
In backwards quadruped mode, how many seconds does it take to knock down a pin placed at 6 meters: _____

6. Case studies and personal experiences

Vizziello, Emanuele (A.S.D. Running Matera)

Cicala, Anna Maria Antonietta (Associazione Sportiva Dilettantistica Sport Club Basilicata)

Ingardi, Sibilla (AID Associazione Italiana Dislessia)

Gavril, Lorana (Asociația București pentru Copii Dislexici)

Ioan, Angela (Asociația București pentru Copii Dislexici)

6.1. Testimonies of children, adolescents and parents

In the intricate tapestry of human experience, the journey of dyslexic children and young adults unfolds with unique challenges and triumphs. Considering the complexities of navigating an educational landscape often full of setbacks, the transformative power of sports emerges as a lighthouse of hope and resilience.

As we investigate the testimonies of both dyslexic individuals and their devoted parents, a rich narrative of perseverance and growth unfolds. Through their shared experiences, a profound testament emerges to the impact that engagement in sports can have, transcending the simple activity to become a catalyst for holistic development.

Beyond the traditional academic success lies a territory where dyslexic individuals find consolation, empowerment, and a pathway towards realizing their full potential.

Through the lens of these testimonies, we uncover not only the tangible benefits of enhanced perception, attention, inhibition, memory, planning, time-management, motor skills, but also the intangible sense of motivation and self confidence that sports can foster. Together, these testimonies illuminate a path forward, where the real potential of dyslexic individuals finds expression through the transformative effect of sport practicing.

Adolescent

D.

When I found out about dyslexia, I thought at first that there was something wrong. Then I realized I learn differently and sometimes think differently. But I knew I was good at math, and I was an intelligent kid.

I give this advice to all children with learning differences:

They should practice sports, find out what sport suits them, and try to be as good as possible.

Parent

M.

D. has overcome the stress of dyslexia with the help of sports, which boosted his self-esteem and confidence.

When he was a child, he loved to listen to stories, but when asked to read, he didn't want to do it. We didn't understand why.

I am most proud of D. for not giving up the sports. He has studied martial arts for ten years and has a black belt in ninjutsu.

The sport reduces stress from school. The focus required during training can help children develop mindfulness skills. D. had the opportunity to socialize with other children and made friends who shared their interests.

He developed essential life skills that will serve him well into adulthood. Engaging in regular physical activities has healthy habits and positive relationships with teachers, classmates, friends and family members.

Adolescent

A. B., 6th grade, 12 years old

In primary school, I didn't know that I had dyslexia, and I didn't understand why, for me, everything related to reading and writing was more difficult than for the other classmates. My confidence in myself had started to decrease, and somehow, I had to accept that this was who I was. When I found out that I had dyslexia, I felt somehow relieved because now I understood that I had a brain that works differently but also that there are tools and strategies to help me overcome this problem.

The fact that I practice cycling significantly increased my confidence, and I also tried to apply specific strategies from cycling at school.

When you set goals in cycling and achieve them, whether to cover a greater distance, conquer a problematic hill or participate in a competition, when you overcome these challenges, you prove to yourself that you can do it.

Considering that in cycling, I am in 3rd place in the National Cup, I made extra efforts at school and ended up being in the first ten children in my class and ending the 5th grade with a score of 9.81. The cycling experience helped me to surpass myself at school as well.

Cycling also positively impacts well-being, offering an excellent way to release stress, connect with nature and make new friends.

Dyslexia and sport – S. B., mother

A. was already practicing cycling when she was diagnosed with dyslexia. She was generally self-confident during her extracurricular activities but felt inferior at school because she couldn't perform as well as the others. During the 2nd grade, she asked me to receive extra lessons so that she would be "as good as the other children, " or she would come to me and ask me to help her learn. Sport taught her to look for solutions and understand that any obstacle can be overcome if you put in more effort.

Adolescent

A.:

I've practiced various sports since I was six, such as karate and dance. By the third grade, I discovered I was dyslexic, which explained many difficulties I faced in school. I continued with competitive dancing. Being in a community where I felt like everyone else didn't have to read or write was comforting, and dyslexia wasn't an obstacle. After school struggles with teachers and classmates, I felt disconnected and found solace in being part of a friendly community. In the dance club, I learned to work as a team, but most importantly, I learned to win with respect for others and to lose without feeling ashamed. I learned to use difficulties to motivate myself even more to achieve my goals. Sports provide a break from school activities, so we put aside tablets, phones, and screens in general and prioritize our health. For a dyslexic person, sports are a necessity!

Parent:

Raising a dyslexic child is an endurance exercise, wanting to change everything that doesn't work in education. It's challenging, and you discover that every time you think you can't handle more, there's a little bit more you can. You realize you have the strength to encourage your child even when you don't see "the light at the end of the tunnel." You're sure that all the teachers at school will know you; you'll encounter obstacles and unsympathetic people at every turn, but also exceptional individuals with the actual teaching gift, as in Ion Creangă's books. The path to knowledge for a dyslexic child is arduous, but there will be many joys, such as when our dyslexic child says something of profound depth. That's when we realize that everything has a reason to be as it is!

I. 24 years old – animation designer

Then came my first basketball game. I was excited but didn't want my classmates to see me nervous, so I kept my emotions to myself. I played against some taller girls and maneuvered around them, even under them, just as I practiced during training. Unfortunately, we lost the game; they were better than us. However, the atmosphere was electrifying, and the supporters on the sidelines (with my mom at the forefront, cheering and shouting, "Go, Ioana!") gave me courage. Eventually, I stood out as the best player on the field, receiving a trophy and a medal for the best pass. Ultimately, it was different than when the whole class succeeded in lessons; only I had a notebook full of mistakes. We were all together, with successes and mistakes, and I had an extra trophy. My classmates congratulated me, and I felt like I wasn't the class outcast anymore.

Then came more games (with my mom still cheering in the front row), and we started winning. Then came training camps where workouts were complemented by physical conditioning in the mountains running. It was fantastic to be among the kids; there was no longer a difference between us. We were a team, and our coach was extraordinary—we all loved her.

Above all, I also participated in a swimming competition, where I once again won a medal because I had been swimming since I was little (my dad was a champion in his college years and 'threw' me into the pool at two years old). I managed to outswim the boys in freestyle so they wouldn't get upset; I even played soccer with them afterwards.

Looking back, I believe that sports not only helped me correct many things that, as a person with dyslexia, caused me problems both in and out of school but also helped me gain confidence, be part of a group, be seen as a winner, and most importantly, taught me to accept losses and not panic.

It's an exercise that was very useful throughout my subsequent school life because, until I finished college, I went through dozens and dozens of exams. When I passed them, I celebrated; when I didn't, I took a deep breath and started from scratch until I succeeded.

I'm grateful to the coaches, sports teachers, and my parents for guiding me from being the girl who bumped into people and walls to a young woman who enjoys life and isn't afraid of balls, people, or walls anymore.

Parent

Sport has always been important in our family, and we've always believed that a healthy mind and body are essential. Due to our daughter's experience with dyslexia, a challenge that took us through every possible state, we understood that we needed to take a different path from what other parents were doing and try to provide her with moments where she could feel valued. School was doing enough to break her confidence, especially since, at that time, there were no laws in Romania regarding dyslexia, and honestly, neither we nor the teachers truly understood what it meant to be dyslexic.

It was evident that there needed to be compensation somewhere and that there had to be strengths. One was sports. First, individual swimming, then basketball as a team sport. Equestrian activities were added, especially during vacations, with an extraordinary effect on balance and coordination.

Sport constantly accompanied her evolution; paradoxically, dyslexia and academic failure became an advantage. While her classmates were giving up sports to excel academically, sacrificing all their free time, our daughter, not aiming for high grades, continued her sports activities, even without making it a future profession. We're not entirely sure, but we believe that, alongside speech therapy and tutoring, sports helped correct her learning difficulties (reading, memory, orientation in time and space, reaction capacity, and the courage to do things in her way without fearing that she didn't meet standards).

Parents

We are Iulia and Catalin, parents of a dyslexic girl - Ileana. From the age of 6-7, Ileana started swimming and later horseback riding. At that time, she was also undergoing intensive speech therapy, unaware of what we were dealing with. Her speech therapist suspected dyslexia, which was later confirmed towards the end of second grade, beginning of third grade. Subsequently, specific assessment tests were conducted for a precise diagnosis. Throughout these challenging years, sports became her "escape" and moral support. Both sports, both horseback riding and swimming, came naturally, at the insistence of the child, and looking back now, we can only congratulate ourselves for listening to her desires. There are studies regarding hippotherapy, but we discovered this much later, almost accidentally. And now we wonder how the child felt about what was good for her. Initially, we wondered about her obsession with horses and water. But we decided to try it out and figure out later if it was just a whim. That wasn't the case; Ileana continues to practice both sports to this day at an agreement level. There were years when she intensely practiced swimming with a coach, three times a week, and horseback riding as well. Every time, we noticed significant differences on the days she didn't go to the pool or to the horses. She was happy, had a sense of well-being, and despite physical fatigue, learning, homework, or other cognitive activities were easier for her, with more attention and concentration. Sports also helped her become more organized and disciplined in her activities, as she faced difficulties in this area too. Many times she asked to do her homework at the stables. She spent a lot of time with the horses, not just the actual riding hour. We took advantage of this and worked on certain exercises with her there, in play - we recorded her telling stories and sent the recordings to the speech therapist. They were the most successful recordings; there was a clear difference in expression, logical thread of ideas, stemming from the wonderful mental state the child was in.

What Ileana says - "I have an exceptional and unusual talent in horseback riding and swimming." If a few days pass without her doing her favorite sports, the question comes in waves, "When are we going horseback riding or to the pool?" It's important that the sports were not chosen by us, the parents, but by her. Otherwise, they probably wouldn't have lasted or had the same positive impact on all her activities. Her words may seem simple, but for a child who sees that they can't read quickly and correctly, or calculate easily, or remember what they've learned, for a child who has accumulated so much

frustration, this confident statement is wonderful. The fact that she does so well in these two sports has given her confidence and boosted her self-esteem. Ileana now understands very well that through training and exercise, she can achieve anything she sets her mind to. It's just a matter of time and hard work, but nothing is impossible when she wants it.

6.2. Participants and data research

To better understand the current situation of individuals with SLD who play any kind of sport, AID and various partners carried out an extensive literature search, leading to the creation of an exploratory tool based on an online questionnaire. The administration sample involved three different types of subjects: coaches, parents, and children/young adults (between the ages of 12 and 30). The variety of subjects involved required the creation of three different questionnaires. The sample included 2078 participants in total, distributed as follows: 1427 parents, 237 children and young adults, and 414 coaches. The countries from which participants were responding were: Italy, Ireland, Spain, and Romania

An almost perfect balance of males and females was observed. Care was taken to ensure that no sport was left out. The questionnaires analysed the relationships between children with specific learning disorders and sports across 44 different disciplines. The practice of sports was analysed over the full range of possible skill levels (from amateur to professional).

Questionnaire 1 Coaches

A total of 414 coaches participated in the questionnaire. The age distribution ranged from a low of 18/25 years to a high of over 60 years. More than half of the sample stated that they teach a team sport. A majority of the coaches (about 80 percent) reported that they do not have a specific learning difficulty. Each individual coach involved was asked to state their years of experience by placing a choice between a minimum of one year to over 20 years. The majority of the sample turned out to be coaches in a few specific disciplines such as: Gaelic soccer, soccer, volleyball, tennis, rugby and basketball, and others.

Going deeper into the focus of the research, the first questions related to the topic of SLD and sports. A large number of coaches (about 40 percent) reported some form of general knowledge regarding SLDs while another 55 percent said that they have knowledge to some extent. In relation to training on the topic of SLD, it was noted that 16% of coaches have conducted training courses followed by 2% who are informed but not trained. The remaining percentage did not provide an answer to the question posed. From theoretical training, the research moved on to explore coaches' personal and practical experiences with individuals with a specific learning disorder. It quickly emerged that the majority of the sample did not have significant experience with athletes with a specific learning disorder, having encountered 'only a few' and 'occasionally' in their professional experience. 15% of the sample on this first key point state that they cannot provide a definite answer as to whether or not they have coached athletes with a specific learning disorder.

With respect to motivational and technical questions, the sample we involved tended not to take clear-cut positions, placing themselves largely in more modulated and possibilistic positions ('maybe yes' or 'maybe no'). For example, in relation to the question on the possible need for an athlete with a specific learning disorder to engage in personalised training, we found that 35% of the sample on this specific position followed by similar but lower percentages of responses in partial agreement or partial disagreement. There were similar distributions to the question about the need for more stress. The majority of coaches believe that an athlete with a specific learning disorder may be less confident in their athletic abilities. Approximately 14% of the sample believed that a person with a specific learning disorder might be more gifted in sports than their typically developing peers. On the same question, we also found another 15% of the sample thinking the opposite, while a predominant 65% of responses were open to both possibilities. Almost identical was the distribution regarding an individual with a specific learning disorder propensity for team or individual sports: equal percentages of clearly defined responses (averaging around 15% for affirmative responses for both types of sports) and high percentages (do not agree but do not disagree either, in other words, it could be both). More in-depth statistical analyses performed through the interaction between a specific condition and an examined variable found the following:

A. Coach instruction does not significantly correlate with any of the conditions examined.

B. Coach's years of experience correlated significantly only in relation to the question "do they need" to be pushed/encouraged.

C. A positive correlation between those with a greater knowledge of specific learning disorders (where coaches took courses) and the recognition of greater sports skills of people with a specific learning disorder. This variable correlates with the presence of responses given by coaches operating in both team and individual sports but not with coaches operating in only one of the two modalities.

D. The answers to the question of the need for customised training programmes for individuals with SLDs are inversely correlated with knowledge of SLDs: never having trained an athlete with SLDs is associated with the idea of a greater need for specific training programmes.

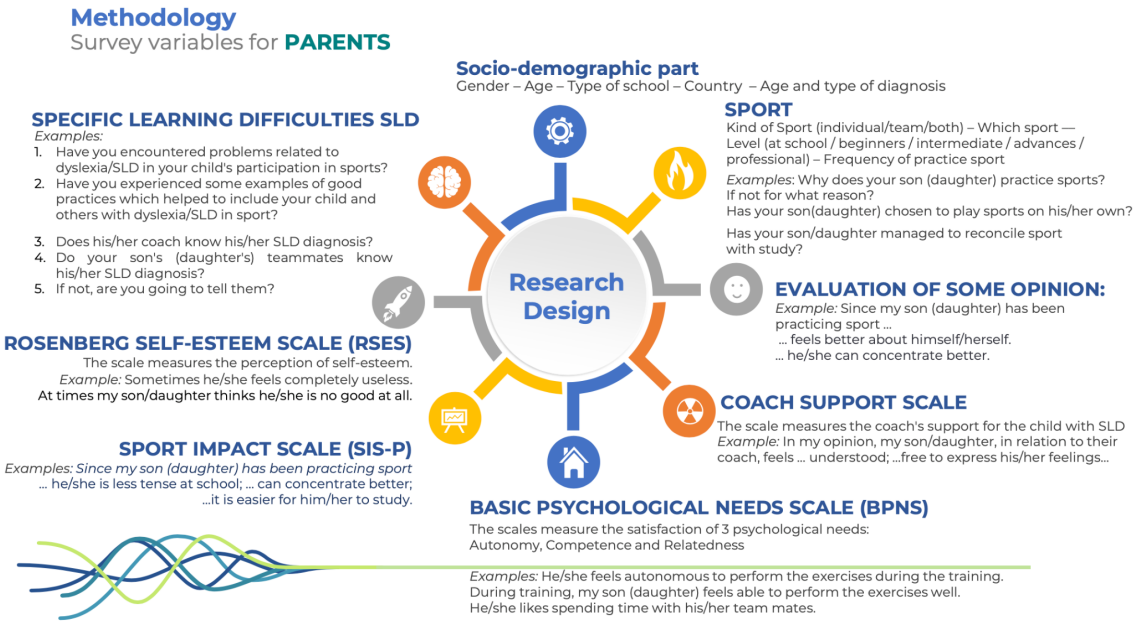
E. Finally, a positive correlation is found between coaches who have coached people with a SLD during their careers and the recognition of greater sporting and relational (team sports) talent in children/youth with a SLD.

Among the various data that emerged, it is certainly of greater interest to have ascertained that greater theoretical and educational knowledge as well as on an experiential basis will allow for more accurate and meaningful answers with respect to the questions posed.

Questionnaire 2 Parents

Similar to the methodology used for coaches, several areas of investigation were included in the research design for parents. These included socio-demographics, type and level of sports played, information about their child's SLD (type, age of diagnosis, sharing of one's neurodiversity with coaches and friends, practices used to improve levels of inclusion in sports, any sports-related difficulties), child's self-esteem perception, the impact of sports on academics (e.g. memory and attention), parents' opinions (e.g., feels better), relationship with coach (e.g., understood, free to express feelings) and levels of satisfaction of certain psychological needs (autonomy, competence and relatedness), see diagram below (Figure 2).

Figure 2. Survey Variables for Parents.



In the section on possible interactions between sports and school, parents reported a good ability to mix sports activities with study, while 33 percent reported some difficulties to do so. Children who participated in sports, based on what parents reported, tended to feel better about themselves and found it easier to study. This was associated, again according to parents' perceptions, with an improvement in memorisation skills (43 percent partly true, 24 percent fairly true) and concentration (40 percent partly true and 32 percent fairly true). The combination of these positive effects was associated, according to the questionnaires, with a lowering of tension levels in the school environment. Relational skills would also seem to benefit from playing sports; 70 percent of parents state that they have observed an improvement in their children. When asked about possible negative effects (limitations) in sports related to the presence of a SLD, the sample of parents splits almost symmetrically, with 43% responding positively and the remaining 57% responding negatively. More specifically, the sample states difficulties in motor coordination, immediate understanding of instructions given by coaches (e.g. difficulties being able to distinguish right from left), and in significantly lower percentages, from increased fatigue from the relationship with the coach and concentration. About 60 percent of parents say they have never seen specific accommodations implemented for their children with a SLD. For the majority of parents, a key role in the implementation of good practices should be sought by the coach to follow the type of sport and team and the manner in which the instructions are

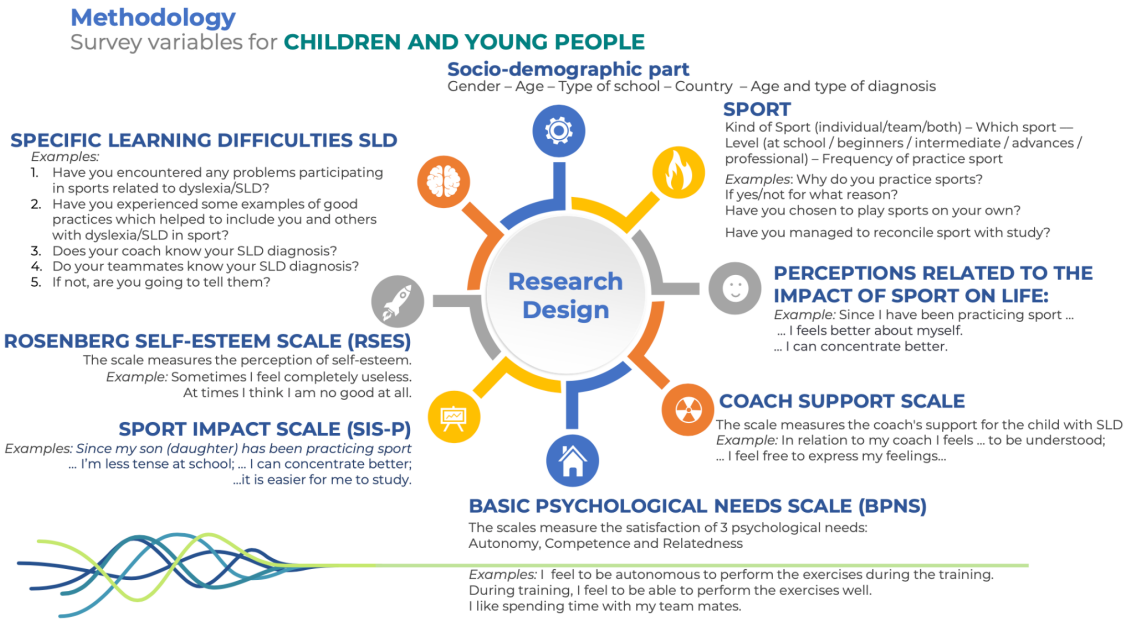
given. In order to intervene, a coach should be informed with respect to the presence of any difficulty, and in this regard, parents should report knowledge of their son/daughter's SLD. In 50% of cases, the choice to inform or not to inform depended on the idea that it would be irrelevant and would not change anything (with possible underlying causes being distrust, shame, and unwillingness of the child to make the difficulty known). In the relationship with teammates, the situation appears different but only selectively for a small circle of friends who, according to the parents' statement, would have been informed of the presence of the SLD from the beginning.

Statistical analyses geared toward investigating the more purely psychological aspects note that the perceptions of parents of children and youth who participate in sports generally found a significantly higher level of self-esteem than those who do not participate in sports. According to parents' perceptions, as levels of sports attendance increased (except at the professional level), the following increased: perceived support from the coach, satisfaction of psychological needs, self-esteem, and the impact of sports on the lives of children and youth.

Questionnaire 3 Teens

The questionnaire aimed at teens/young adults was developed to provide a comparison with the questionnaire aimed at parents and has at its core the same structure of questions reported in the parent questionnaire previously described. The research design was articulated as shown in the following image (Figure 3).

Figure 3. Survey Variables for Children and Young People.



A total of 237 teens and young adults, moderately balanced by male and female gender, participated in the questionnaire. The age distribution of the sample ranged from a low of 12 years to a high of 30 years.

The sample was mostly of Italian nationality (85.4 percent) and had a Gaussian distribution in terms of level of schooling, with a greater presence of boys attending secondary school. Boys of all grades and also young workers were also present in the sample.

About 60 percent of the sample reports having been diagnosed with an SLD within the age of 10 years.

Of those who responded to the questionnaire, only 66 percent practised a sport. The disciplines most practised were as follows: soccer, swimming, volleyball, Basketball, and gymnastics. About 60 percent of the sample reported that they attended sports activity on a weekly frequency level, and about 50 percent of the sample reported practising sports at an advanced level, such as participating in competitions. Looking carefully at this data, however, it also reveals a high disengagement of sports by children who have a specific learning disorder (about ⅓ of the children). Among the reasons reported are lack of time, lack of enjoyment of sports, and low tolerance for excessive competition. As reported in Law 170 /2010, in which reference is made to the

possibility of using additional time at school as a compensatory tool to cope with a greater slowness in performing homework or reading texts etc., children with SLD need more time than their peers for afternoon exercises and homework, which leads them to lack available time to spend in sports practice. This hypothesis is partially confirmed by their perception of being able to reconcile sports practice with home study. The highest frequency of responses is observed in the answers "quite well (44.6%) / with some difficulty (39.5%)."

From the responses of the boys/girls and young adults, a greater perception of personal, and socio-relational well-being and a reduction in school agitation was observed as sports practice increased, along with a reduction in the use of smartphones and video games. Regarding perceptions of difficulties due to specific learning disorders during sports practice, 45.9 percent of participants responded that they experienced problems. Specifically, the difficulties most expressed by the children during sports practice were regarding exercise practice, motor coordination, perceived difficulty, distinction between left and right, and amnestic memory of names. At the level of best practices implemented by coaches for boys with SLD, about 69% of the sample did not perceive that there was any attention paid to them.

The disclosure of this characteristic to the coach occurred for less than half of the sample and of these boys/girls, more than half who responded said that they had not told their coach, while more than half were not willing to voluntarily confide it to their coach, and a further 35.7% were still considering whether or not to tell their coach. From these results, only about 10% would be in favour of declaring it to the coach. The predominant response from the sample to not wanting to expose themselves in telling this information to the coach was "because it won't change anything" (77.8%), while 15.6% said that they were ashamed to tell.

With regard to "confiding in the team group" it became evident that it was rarely told to the whole team, and disclosed only to some teammates with whom they feel most comfortable, while they were not going to tell others because they are ashamed (22.2%) or because they do not trust them (11.1%). Such information provides us with an initial insight into the importance of creating an appropriate cultural base even within sports activities to foster inclusiveness and allow children with SLD to express themselves freely in a more welcoming and understanding group climate.

From the statistical analyses performed, a new questionnaire was composed to measure the level of support from the coaches toward children/young adults with SLD. The Basic Psychological Needs Scale (BPNS), created by Deci and Ryan (2000), was used within the questionnaire, which measures the satisfaction of three psychological needs: Autonomy, Competence, and Relatedness.

The scale measures the psychophysical impact of sports on children/youth.

Children and youth who participate in sports generally have significantly higher levels of self-esteem than those who do not participate in sports.

6.3. Conclusion

A. Children and young people with SLD often do not feel comfortable in school contexts where they experience increased frustration and discomfort. Sport gives children a comfort zone where they can feel good and express themselves, placing them in contexts of equipotentiality.

B. Sport helps individuals to fully express their abilities that are often negatively conditioned by low self-esteem and the shame of not being able to read a passage of text fluently or solve a maths exercise very well.

C. Playing sport can help boost self-confidence.

D. Playing sport can help to increase students' motivation and improve school performance.

E. Sport has been shown to have a very strong impact on the lives of children/young people by helping them to feel better about themselves, improve memory, be less tense at school, be more focused on homework, improve mood, socialise better with peers and spend less time in virtual realities such as video games.

F. The questionnaire shows that children and young people with SLD are fairly good at different sports. It would seem, however, that this ability is to a large extent conditioned by the coach's ability to understand and accommodate the specific characteristics of individual athletes, especially in relation to the presence of a SLD. These elements make it particularly urgent and accentuate the need for the training of coaches to better calibrate their practice in the context of sporting activities.

6.4. Lessons learnt

Children and adolescents with dyslexia who overcome their fears and lack of confidence through sports offer some valuable lessons:

Resilience: Their experience demonstrates resilience in facing challenges. Despite difficulties, they persist, adapt, and learn from setbacks, a crucial life skill.

Self-Discovery: Engaging in various sports allows them to explore and discover their strengths outside academic settings. They learn what they excel at and where they can shine, boosting their self-esteem.

Physical Confidence: Sports provide a platform to build physical confidence. Mastering a skill or excelling in a sport helps them feel more capable and confident.

Teamwork and Social Skills: Through team sports, they learn the importance of collaboration, communication, and teamwork, fostering better social interactions and friendships.

Coping Mechanisms: Sports teach coping mechanisms. They learn how to handle pressure, setbacks, and failures, crucial skills that can be applied in various aspects of life.

Identity Beyond Academics: For those who may struggle academically due to dyslexia, excelling in sports provides an alternative source of recognition and achievement, shaping their identity positively.

Mind-Body Connection: Engaging in physical activities helps strengthen the mind-body connection. This connection can positively impact cognitive function and emotional well-being.

Determination and Focus: Children and adolescents with dyslexia who succeed in sports often display high levels of determination and focus, beneficial traits in all aspects of life.

Their experiences highlight the importance of holistic development, where success isn't confined to academic achievements but is equally celebrated in physical and personal accomplishments.

7. Conclusions and Final Reflections

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In conclusion, dyslexia, dyscalculia, and dysgraphia are distinct learning differences that can significantly impact individuals' academic performance and daily functioning. While each condition presents its own set of challenges, they share common themes such as difficulties with reading, writing, and mathematical concepts. However, with the right understanding, accommodations, and support, individuals with these conditions can achieve success in education, the workplace, and wider society.

It is essential to recognize that each person's experience with dyslexia, dyscalculia, or dysgraphia is unique, and their abilities and challenges may vary. These conditions are not indicative of general learning difficulties but affect specific skill areas, with impacts that can fluctuate based on environmental factors and individual circumstances.

Moreover, these conditions often co-occur with other learning differences or neurodivergent profiles such as ADHD, autism, dyspraxia, and developmental language disorders. Identifying all educational needs is crucial to implementing appropriate interventions and support systems.

The terminology used to describe these conditions may vary, and it's important to respect individuals' preferences when addressing them. While dyslexia, dyscalculia, and dysgraphia are recognized disabilities under national and EU law, many individuals may not identify themselves as "disabled," and their perspective should be acknowledged and respected.

Overall, understanding and accommodating the unique needs of individuals with dyslexia, dyscalculia, or dysgraphia is crucial in fostering their academic and personal success, promoting inclusivity, and ensuring equal opportunities for all. Having a stronger understanding of these learning differences makes it easier to ensure that children are fully included in physical activities and sports.

Engagement in physical activity and sports offers a multitude of advantages for both physical and mental health. From improving cardiovascular fitness to enhancing mood and reducing stress, regular participation in sports is vital for overall well-being.

Sports serve as a powerful vehicle for social inclusion, breaking down barriers and fostering inclusion of diverse groups. By providing a common ground for individuals from diverse backgrounds to connect, physical activities and sports can promote a sense of belonging and community cohesion.

Participation in sports not only enhances physical fitness but also cultivates essential social skills such as teamwork, communication, and leadership. Through collaborative efforts and opportunities for personal growth, sports empower individuals to navigate social interactions effectively.

In summary, sports are not just about physical activity; they are a catalyst for personal and social development. By recognizing and harnessing the benefits of sports, we can promote healthier, more inclusive communities and empower individuals to thrive both on and off the field.