

A case study of psychological empowerment of three children with Autism Spectrum Disorder (ASD) through football coaching

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Autism Spectrum Disorder (ASD) is a developmental disorder that appears during the first three years of life and is characterized by communication problems, deficits in social interaction, and repetitive and restricted interests and behaviors. Although sport provides an opportunity to promote the psychosocial and motor development of people with intellectual disabilities, few investigations have been conducted to identify the most suitable training method for children with ASD (Bremer et al., 2016). The aim of this research was to study the psychological and motor development of three children with severe ASD. The children were placed in a sports programme called "Football Together", which lasted 8 months and included two weekly training sessions. The development of the participants' psychosocial and interpersonal skills was assessed through semi-structured interviews with the parents before and after the entire period of activity. It was also assessed through systematic observation of the children's behaviour during training by a sports psychologist throughout the programme. The three children improved their motor and interpersonal skills through the training programme. The training model and evaluation methods revealed the key role played by the sport and football in the motor and psychosocial development of children with ASD.

KEY WORDS: Autism, children, sport program, attentional skills, social skills, parents.

Autism is a developmental disability that falls within the autism spectrum disorder known as ASD (APA, 2013). The introduction of the spectrum concept marked a turning point in the understanding of this disorder.

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In many cases, the same symptoms that make up the symptomatologic core of the clinical condition can vary quantitatively, over varying degrees of severity. The essential features present in autism spectrum disorder include a significant impairment in social interaction and communication, and a highly restricted area of activities and interests (APA, 2013). Similarly, individuals with autism spectrum disorder also show a prolonged impairment in social interaction and therefore develop restricted and repetitive patterns of behaviour, interests, and activities. This is often referred to as stereotypical behaviour. A further key assessment criterion for autism is the level of severity and support required, which is divided into three levels that describe the degree of impairment: the degrees of severity (Kandola, 2019). The level of severity is assessed with reference to the two areas of the diagnosis: communication and social interaction, and limited interests and repetitive behaviours. In level 1 autism (mild), the person requires support; in level 2 autism (moderate), the individual requires substantial support; and in level 3 autism (severe), the individual requires very substantial support. Besides, people with autism may have difficulty with expressive language, understanding or retrieving words, and interpersonal communication (APA, 2013). The use of language as the predominant channel of communication can make, in many cases, interaction with the persons with autism difficult and may disorientate them. Conversely, by supporting language with gestures and visual modalities, it is possible to build a better relationship with them. Due to these specific characteristics such as difficulty in social integration, communication problems, limited interests, and the presence of repetitive actions, young people with autism may have difficulties in engaging in play experiences with peers and participating in physical activities and sports (Yanardag & Yilmaz, 2010; Block & Halliday, 2006).

Empowerment through Sports

In recent years, people with disabilities have become much more visible in our society than before and the treatment of their problems has also undergone significant changes (Shapiro, Pitts, Hums & Calloway, 2012). As a result, more and more individuals with disabilities have access to schooling and social inclusion programmes, which range from leisure time to employment. Amongst the various opportunities that have opened up, there has been a growing awareness that sport can be a context in which the psychosocial and motor development of people with disabilities is promoted. Hutzler (1990) had already introduced the concept of empowerment in sport for

people with disabilities, based on an awareness of one's own competences and a perception of self-efficacy. The aim was to promote, through sport experience, a better control of personal resources in relation to the environment in which one lives, with the use of skills that are not usually possessed by people with disabilities (Hutzler & Bar-Eli, 1993). In this sense, from an empowerment perspective, people with disabilities are seen as citizens who must be assured rights and choices, rather than as dependent individuals who must be helped, socialised, and provided with skills. Hutzler's model postulates that sporting activity brings about a number of psychological and social benefits in people with disabilities, relating to motor performance that drives functional efficiency, experiences of achievement that improve self-efficacy, improved body confidence that promotes physical self-concept and self-esteem, better control of mood and affective disorders, and growth in skill level that leads to better social acceptance. A recent review of the effects of sporting activity in young people with physical disabilities has better specified what was hypothesised 30 years ago by Hutzler, showing that the improvements achieved affect the development of socialisation, sense of belonging to a community, perception of identity, psychological empowerment and personal independence (Kissow, 2015). In addition, with regard to people with physical disabilities, a major boost to the knowledge of development of well-being and psychosocial skills has been provided by the popularity and growing interest generated by the Paralympic Games, which bring the sporting achievements of those with physical disabilities to the attention of audiences worldwide (Jefferies, Gallagher & Dunne, 2012; Day, 2013; Reardon et al., 2019).

Effects of Sports Practice in People with Intellectual Disabilities

With regard to people with intellectual disabilities, the knowledge developed over the past 20 years in relation to the empowerment function of physical activity and sport is more limited than for people with physical disabilities. The terms intellectual disability are used to refer to impairments in intellectual functioning and behavioural adaptation that originate before the age of 18 (Schalock et al., 2010). A review of motivational correlates showed that exercise and sport contribute to wellbeing and that improved fitness and acquired skills play a mediating role in the development of a better perception of self-efficacy and social competence (Hutzler & Korsensky, 2010). Notably, only one review devoted entirely to young people with intellectual disabilities has been conducted, which is a quantitative synthesis of a wide range of health improvement outcomes as-

sociated with physical activity (Kapsal et al., 2019). Indeed, previous systematic reviews examining the effects of physical activity (Jeng et al., 2017; Hocking et al., 2016) have focused on a limited range of outcomes, have not specifically analysed only young people with intellectual disabilities, or have not predominantly examined outcomes associated with physical activity. This review revealed that physical activity has positive effects on the physical fitness and psychosocial health status of young people with intellectual disabilities. In particular, it was found that endurance training has the greatest impact on physical fitness, while the development of sports skills and the teaching of basic movements increased physical and psychosocial health. Moreover, the positive impact of these teachings on physical well-being is more evident in children than in adolescents, and in young people with severe intellectual disorders than in those with less severe disorders. It is suggested that professionals working with these young people focus their interventions on the training of sport and movement skills. These include activities such as team game skills training, ball-throwing programmes, judo training or table tennis. These activities appear to be more effective in increasing both physical and psychosocial health than other types of training, such as resistance training, aerobic training and balance training. The greater benefits of this type of training may be due to the social nature of many of these activities compared to the solitary nature of endurance exercise or running. This is also consistent with previous research (Johnson, 2009) that has shown that young people with intellectual disabilities gain more benefit from physical activity when performed in groups. What is to be understood by group activities, however, will need to be clarified further in the future, as the investigations reported in Johnson's (2009) review concern fitness activities performed in groups and not team sports. Westendorp, Houwen, Hartman and Visscher (2011) found that young people with a borderline or mild level of intellectual disability who took part in team sports showed better self-control in ball control than the same level of intellectual disability who did not take part in these sports. The few studies conducted in the area of physical activity and sport among young people with ASD show that they are less physically active than their peers with typical development, and that the proportion of sedentary individuals rises with increasing age, which in turn causes problems such as obesity, cardiovascular disease and problems with the respiratory system (De, Small and Baur, 2008; Pan, 2011; Oppewal, Hilgenkamp, van Wijck & Evenhuis, 2013; Lalonde, 2017; Kahathuduwa, West, Blume, Dharavath, Moustaid-Moussa & Mastergeorge, 2019). Major literature reviews have shown that the motor activities practiced include running, cycling, weight training, roller skating, horseback riding, walking, and water and treadmill activities (Lancioni, et al., 2009; Lang et al., 2010; Sowa & Meulenbroek, 2012; Luiselli, 2014; Bremer, Crozier & Lloyd, 2016). These studies have shown

that short, intense exercises can increase the expression of desirable learning and reduce behavioural problems during and immediately after training sessions.

Team Sports and Intellectual Disability

Unfortunately, the reviews cited highlight the lack of interest seen to date in team sports, in the development of well-being in young people with ASD. The reason why individual and endurance sports, such as running and swimming, have been used more frequently than other sports is it does not require special sports kit, allows easier adaptation to the available space, allows the formulation of simplified sports programmes for this type of young people, and reduces teaching difficulties related to non-verbal communication and language. For example, running is a relatively simple activity which, if done at a basic level, can be led by any caregiver, without them being a track and field coach. In contrast, training football, like other team sports, requires learning specific technical fundamentals. In addition, playing a game of five-a-side football requires that young people with intellectual disabilities have learned to pass the ball and cooperate with each other. In this way, football stimulates the development of pro-social behaviour and interpersonal communication between young people with intellectual disabilities and with the coach, and thus could be of great use in young people with ASD, in order to stimulate the development of those skills that play a marginal role in individual activities. Confirming these hypotheses about the positive function of football, a recent review identified a limited number of investigations in which young people with ASD practised football (Vetri & Roccella, 2020). The positive effects of exercise programmes have been well evidenced in people with ASD in the areas of psychological well-being, cognitive performance, and health. There is less evidence on the appropriateness of team sports for people with autism. Researchers seem to suggest an overall positive effect of organising team sports for people with ASD, however the difficulties these young people show in interpersonal relationships and limitations in motor functions must also be addressed. At this regards, Hayward et al. (2016) investigated a group of 18 children with ASD (7-11 years old) who participated in a 16-week community-based programme. The researchers assessed physical activity outcomes such as pre- and post-football skills, participant attendance, and parental satisfaction. The aim of their football programme was to teach children with ASD basic football skills, giving them the opportunity to have fun and interact with peers. The results supported the feasibility and effectiveness of a football programme because the participants showed improvements in shot accuracy and agility on 15 yards. The overall satisfaction of the parents was very good and they perceived their children as more active and enjoying playing foot-

ball. Our research group has been working for six years in the field of intellectual disability, with particular reference to young people with autism spectrum disorder (ASD), and on the basis of the data provided by literature has developed a football teaching programme, called Football Together. Our professional backgrounds as sports psychologists allowed us to organise a real sports training programme. The other psychologists involved in the project were also chosen for their background in sports psychology. This is so that they could interact effectively with the football coaches and could be on the field with knowledge of how to motivate and encourage the sports involvement of young people with ASD. For these reasons, the project was promoted by the Roma Cares Foundation, a non-profit organisation linked to AS Roma, and the sport association Accademia di Calcio Integrato, of which one of the authors (Alberto Cei) is a founding member. As part of this project, Cei et al. (2017) recruited 30 children with ASD (6-13 years old) to participate in a study on the effects of a training programme based on football instruction. All children underwent initial and final quantitative motor assessment. The authors used a qualitative approach to assess psychosocial skills at the beginning and end of the training period through interviews with the youngsters' parents and school teachers. The results showed that parents and teachers perceived that most of the children with ASD had improved their psychosocial and communication skills. Motor skills assessed quantitatively showed significant improvement in six out of ten tests: walking between cones, running between cones, rolling on the mat, jumping high (three 20/30 cm obstacles), grasping (five throws from 1 to 5 m away from the instructor), and balancing on the jellyfish. A third research was conducted by Chambers and Radley (2020) who used a different approach, preferring a peer-mediated intervention to promote skill acquisition in children with ASD. The authors selected three male students with autism (aged 11 and 12 respectively) and trained a 14-year-old peer interventionist common to all three participants. The football skills assessed were throwing, kicking, and defending. During the training sessions, the peer interventionist explained and demonstrated the football skills to the children with ASD, and after the exercise provided technical instructions to correct errors. At the end of the study, the three participants rapidly acquired the trained football skills and the accuracy in executing the skills persisted over time, in the absence of any peer intervention. The present study originates from the two previous investigations conducted within the Calcio Insieme project, which highlighted the motor and psychosocial improvements obtained by young people, both within a 6-month programme with twice-weekly training sessions of one hour each (Cei et al., 2017), and for a shorter period of two consecutive weeks during summer camp, with a total number of 50 hours and daily sessions of 5 hours for 10 days (Cei et al., 2019). The aim of this new investigation is to study, through a multiple case study, the individual outcomes obtained by three children who participated

in the 6-month Football Together programme. To date, only one study (Luyben et al., 1985), has individually investigated three people with ASD playing team sports (adults 24-52 years old), who, in this case, participated in a programme aimed at learning the technique of passing the ball in football with the side of the foot without there being any interaction between them.

Goal of this Study

The aim of this new investigation is to evaluate, through a multiple case study, the effectiveness of the Calcio Insieme programme, by evaluating the individual results obtained by three children with ASD who participated in the programme for a period of 6 months.

The three children selected are characterised by marked deficits in verbal and non-verbal social communication skills, social impairments evident even with supports in place, limited initiation of social interactions, and reduced or abnormal responses to social openings from others. In the area of interests, they show poor flexibility of behaviour. Difficulty in coping with change and restricted or repetitive behaviour appears quite frequently, which interferes with functioning in a variety of contexts. The children involved have been receiving biweekly speech therapy for at least 4 years without interruption, but have never played sport before attending this programme. The chosen case study approach is a useful methodology when a holistic and in-depth investigation is required to explore a theoretical construct. Yin (2003) describes three types of case studies: exploratory, descriptive and explanatory. The exploratory case study design, selected for this study, seeks to develop relevant hypotheses for further study regarding the relationship between an intervention goal, represented in this case by the sporting and psychosocial learning of individual children, and the outcomes obtained at the end of the course. Expected outcomes include a development of social interaction skills, increased motor skills, and basic technical football gestures in the three children with ASD.

Methodology

The psychological and motor development of three children with ASD level 3 (APA, 2013), who took part in a sports programme with a focus on football lasting 8 months for a total of 56 hours (not 64 hours of training due to Christmas and other holidays), was investigated. The analysis of the three cases focused on how participation in a football-oriented activity could influence the learning outcome. In order to demonstrate the effectiveness of

the programme, we chose to follow the case study approach, the most widely used methodology in the field of special education (Cakiroglu, 2012). The choice of this approach allowed: 1. an accurate description of the participants and of the specific characteristics of the sports setting; 2. the reproducibility of the study; 3. a continuous evaluation of the children's behaviour over time, at the end of each session and throughout the duration of the 8-month programme; 4. identification and analysis of the motor-sports exercises actually carried out during each training session. The limitation of the present study is that it cannot be generalised to children of the same age with ASD.

The research was carried out through the following phases:

- Description of the research and signing of the informed consent by the parents of the children involved in the study.
- Interview of the parents for the identification of the areas of investigation.
- Construction of the observation grid based on the indications of the parents as experts of the condition of their children.
- Start of the training course.
- Observation of the areas of investigation by the sport psychologists (social skills, attentional skills and motor skills with particular reference to football) before during and after the 8 months foreseen by the training programme.
- Analysis of the data collected.
- Evaluation.
- Discussion.

STUDY DESIGN

“Football Together” is a project promoted by the Fondazione Roma Cares and the ASD Accademia di Calcio Integrato, whose objective is the development of education and culture integrated with the values of sport through football. According to Kennedy (2005) we follow the AB design: letter A designates the baseline of the study and letter B the training phase which aims to demonstrate the effects of an 8-month sports training programme on the development of children with ASD.

PARTICIPANTS

The 3 children included in this research were selected from all participants in the “Football Together” project according to the following criteria:

- Absence of verbal language and/or ability to understand it.
- Extreme difficulty in facing new places and situations.
- Possibility of aggressive behaviour towards oneself and others (throwing objects, pulling one's hair).
- Never played sports before participating in this programme.
- Poor motor skills.

The 3 children attended the training sessions for a period of 8 months (October to June) twice a week, for 60 minutes. The training sessions took place in groups of 8 children with ASD and trained simultaneously on an outdoor futsal field. Each participant was previously diagnosed, by the public health service, with ASD level 3 according to the Diagnostic and Statistical Manual of Mental Disorders (APA, 2013).

Level 3 is the most severe autism diagnosis. People with this diagnosis have significant impairments in verbal and non-verbal communication, often avoid interactions with others, and show limited interaction if they have to answer questions or communicate a need. Their behaviour is highly inflexible and repetitive. They may react strongly to changes and become very distressed in situations that require them to step outside their goal or task. The study was approved by an Internal Review Board and consent was provided by the parents of the children involved.

DESCRIPTION OF PARTICIPANTS

Andrea

Andrea is an 8-year-old child who has an autistic spectrum disorder associated with psychomotor retardation. He uses a very poor vocabulary resulting in very limited communication, and significant difficulty in understanding or using spoken language. He presents hyperkinetic behaviour with extreme attentional lability, as well as a lack of autonomy in daily routines, in relation to his chronological age. At the beginning of this football programme, he had a limited background related to motor skills and playing with the ball. The parents reported that the movement of kicking the ball was performed with rigid and stereotyped movements.

Mario

Mario is an 11-year-old boy. He has a diagnosis of autistic spectrum disorder, attention deficit hyperactivity disorder and language disorders. His profile is

part of a general developmental delay that affects several areas, in particular the communicative-social one, presenting serious difficulties in attention and language. Activity times are short and fragmented with a tendency to repetition of action and ease of distraction from external stimuli. When he arrives at the project, he also has particular difficulties in relationships with both adults and peers. His difficulties concern communication, impulsiveness and behaviour which can proceed with outbursts of anger, aggression and destruction of objects. These behaviours have made it difficult for Mario to participate in any kind of activity with his peers. He tends towards solitary activities and shows difficulty in concentrating on games proposed by others. He shows little tolerance of frustration, especially in relation to more structured requests and limits imposed by caregivers. In these moments he displays oppositional and isolating behaviour. Mario also has difficulties in visual, perceptive and spatial organisation.

Paolo

Paolo is an 8-year-old boy who was diagnosed with autism spectrum disorder at the age of 2. His language is characterised by few words that he does not associate with each other, thus showing an extremely limited communicative capacity. He also has stereotypes characterised by vocal sounds and clapping. He shows difficulty in suppressing some pre-existing incorrect movement patterns and in acquiring new motor patterns. Paolo's greatest difficulty is in the area of communication. Spontaneous verbal requests are sporadic and difficult to understand, and he also displays some non-adaptive vocal behaviours.

Data collection

The motor training programme, with particular reference to football, was based on structured activities and motor routes proposed according to the scheme shown in Figure 1. The activities were organised in stations, each of which was designed to stimulate different motor and interpersonal characteristics. During training, each child was followed and accompanied individually by a coach and observed, as well as by a sports psychologist, through a special observation grid. Training followed a programme of mixed exercises performed in sequence, which could provide benefits in terms of both aerobic and anaerobic capacity, as well as self-regulation (Mauro & Cermak, 2006). The programme includes activities and exercises that require pressure on muscles, joints, and bones such as jumping, pushing, skipping and running between cones while maintaining balance. With this approach, children experience different sensory processes, learn how the body works, and develop physical awareness and

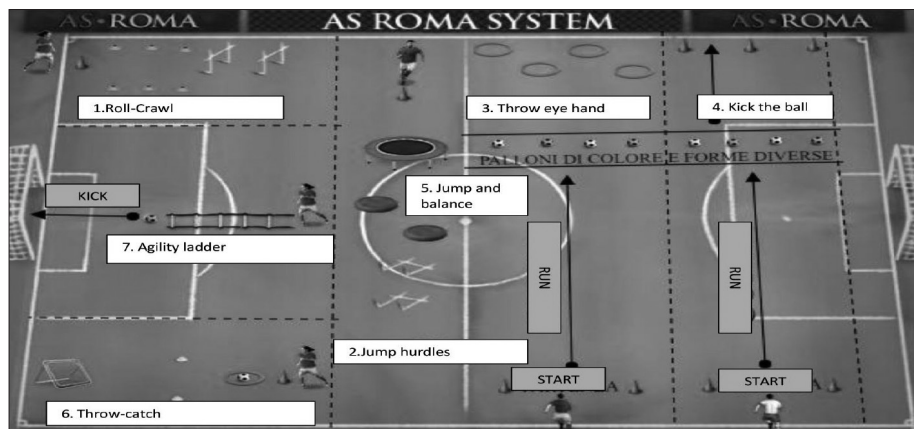


Fig. 1. - Graphic representation of the training circuit.

self-control. Circuit training can be specifically designed to meet the needs of each participant, by including both exercises in which children succeed more easily, and activities and drills in which they show more difficulty. Coaches can increase participation and motivate children by frequently changing activities, organising different stations, and moving quickly between tasks to keep children with poor attention span active. This repetitive pattern allows routine and accuracy to be maintained, taking into account the needs of children with ASD. To facilitate participation and attention, specific rituals were proposed to mark the start and end time of each training session. Short and simple commands were used and technical gestures were broken down and, if necessary, combined with gestural and mimicry examples. Three data collection instruments were used to investigate the effects of this annual programme: recording of training times, interviews with parents, and behavioural observation grids compiled by the psychological area staff.

Structure of the training sessions and time training form

For each training session, the time spent at each station was recorded. The data collection form is a graphic representation of the field in which the training circuit is represented (Figure 1). Next to each motor proposal, at the end of each session, the time spent by the child in that activity is entered. For every session, the time spent in each circuit has been recorded. The exercises proposed are described in Table 1.

Table I
Exercise description, duration, and recovery time of each workout.

Exercise	Duration	Recovery time
Circuit 1: Rolling and crawling. Rolling is a forward motion and weight is supported by the hands (or forearms) and knees. Crawling is done in a reclining position on the floor.	6 minutes	1 minutes rest and transfer
Circuit 2: Jump two low hurdles. This movement involves the participant lifting their leg up, bringing their knee through to the front, and putting the foot straight down on the ground - on the other side of the hurdle, pointing straight down the track. The required speed will vary with skills acquisition.	6 minutes	1 minutes rest and transfer
Circuit 3: Throw the ball in a circle target. Activities in this phase focus on exploration of a variety of throwing movements, involving a variety of balls. Participants in this phase are practicing throwing in different and relatively static contexts. The distance of the throw differs and the participant throws at a stationary target.	6 minutes	1 minutes rest and transfer
Circuit 4: Kick the ball. The participant kicks the ball to a nearby target (5-6 feet away). As he/she improves, they are encouraged to kick harder, while maintaining accuracy.	6 minutes	3 minutes rest and transfer
Circuit 5: Jump and balance on a specific tool (bosu). The participant places one foot in the center of the Bosu and steps on it, balancing on their leg. The coach asks the participant to stay in balance for 30 seconds, encouraging them to not to let their other foot touch the ground.	6 minutes	1 minutes rest and transfer
Circuit 6: Throw and catch the ball. This activity consists of catching, receiving, and throwing the ball back. The participant's eyes follow the ball, allowing them to catch it. Throwing involves pushing a ball away from your body and directing it towards another person.	6 minutes	1 minutes rest and transfer
Circuit 7: Perform agility ladder walking or running and kicks the ball into the goal. The agility ladder allows the participant to perform a large number of agility exercises. Which of the exercises they are able to do depends on the skills of the participant. This exercise always ends in the participant kicking the ball into the goal. This is done in order to link the activity to football, and to motivate the child to move around.	6 minutes	End of session

Interviews with parents

In the context of intellectual disability, particularly with children with ASD, parental involvement is now widely recognised as a key factor in assessing children's improvement (Woodgate, Ateah, & Secco, 2008). In phenomenological research, they are perceived as legitimate informants as they experience the reality of children's lives on a daily basis (Baker, Wuest, & Todd, 1992). In this project, the participation of parents was relevant not only in

regards to organisational and logistical aspects, but also in regards to identifying the observation categories and carrying out an evaluation of progress. Family involvement was pursued with multiple strategies (e.g., participation of schoolmates in some training sessions, birthday parties, meeting with staff and parents to show the training data, going with all the families to the stadium to watch the AS Roma Calcio matches), in order to foster a constant communicative exchange around the process of involvement, growth, and improvement of the children. Particularly in this study, according to a qualitative analysis methodology, initial interviews with parents were used to identify the observation categories. Parents become active players in the evaluation, their perspective and experience taken into account to determine which skills are really important to observe when assessing the children's progress. The interviews, all recorded and transcribed after filling out the appropriate informed consent, investigated the experiences of parents and allowed the identification of 3 macro-areas of assessment: motor activity and football assessed through the recording of training times previously described, attentional skills, and social skills. These areas were investigated through the specially constructed observation grids.

Observation form

A team of sports psychologists with experience in the field of autism followed the participants during the training sessions. The observation grid, previously constructed on the basis of the interview with the parents, was filled in by the staff of the psychological area during the three moments of interest: at the beginning, middle, and end of the training period. The observation grid was divided into two macro-categories that emerged from the interviews with the parents and the autism diagnosis of each child. The two areas are the attentional skills and the social skills. For each macro-area, 3 specific behaviours were identified to allow their evaluation.

ATTENTIONAL SKILLS

Attention is a broad construct that can involve a variety of processes. In the context of ASD, previous research has shown early deficits in switching or shifting attention, presenting disengagement in switching between tasks (Granpeesheh & al, 2014). Children with ASD may find it really difficult to focus on things that do not stimulate their interest, but they can keep their attention on their favourite activities. This project aims to stimulate, through

football, the attention skills of children with ASD. These skills are assessed through the observation of three specific behaviours:

1. Ability to direct one's gaze at other people's faces.
2. Keeping attention on an action and performing it.
3. Imitative ability: ability to observe and repeat the same action.

SOCIAL SKILLS

Autism spectrum disorders (ASD) are characterised by deficits in two fundamental domains: social communication and social interaction, which result in restricted and repetitive patterns of behaviour, interests, and activities (APA, 2013). The social skills deficits are characterised by poor eye contact, lack of joint attention, pedantic or strange speech patterns, difficulty in both initiating and maintaining conversations, lack of social problem-solving skills, lack of empathy, and difficulty in interpreting body language (Schreiber, 2011). To express themselves, children with ASD exhibit unconventional behaviours such as being aggressive, throwing tantrums, or hurting themselves (Wetherby et al., 2015). However, their ability to communicate varies depending on their intellectual and social growth (Josep & Tan, 2012). The aim of this research was to understand how football can stimulate social skills such as recognition of others and active interaction. These skills are assessed through the observation of three particular behaviours:

1. Looking towards the other, recognising, and demonstrating contact and relationship.
2. Sharing activities with the reference person (e.g. passing the ball).
3. Relationship with teammates.

The sheet also has a section at the bottom that allows the observer to write notes about specific situations to remember for future development.

Results and Discussion

In this section we report on the participants' progress and problems during the development of the annual programme (October-June).

TRAINING

Firstly, the frequency of participation in the training sessions during the year, the children's activity time during each session expressed in minutes, and

the children's preferred exercises were considered. The three children with ASD did not participate in all training sessions: Andrea participated in 42 out of 56 training sessions (75%), Mario in 40 (72%) and Paolo in 39 (70%). Working with children with ASD, we have noticed that this represents a typical limitation: continuous attendance at training sessions, as young players with typical development normally adhere to, is very rare. Children with intellectual disabilities encounter three problems much more frequently. The first reason is weather variability, football is an outdoor sport and parents and caregivers sometimes decide not to go to the field because it is too cold or likely to rain. The second reason is issues regarding time that the children's carers (parents, grandparents, and caregivers) may sometimes have in taking the child to training, which can lead to the child's absence. The third issue is the psychological and health problems of the children that may intervene during the week, thus preventing participation. The data on the annual working time of the children during the sessions is relevant information that relates to the psychological state of these three children. The training time is calculated over 50 minutes. The overall session lasts 60 minutes, but at the beginning about 7 minutes are dedicated to "welcome time", and at the end 3 minutes are dedicated to "farewell time". The training is organised for children to spend 5 minutes in the 7 stations, practising the specific exercise proposed in each of them. There are qualitatively significant differences in the working time. The average activity time of the three children during the training is different. Andrea is actively involved in the training (for more than 30 minutes out of 50) in 83% of the training sessions and is only active for less time in 17% of the training sessions. Mario shows a similar profile to Andrea, as he is involved for more than 30 minutes in 93% of the training sessions, whereas he is only active for less than 30 minutes in 7% of the training sessions. Contrastingly, Paolo performs exercises for less than 30 minutes 67% of the time, and is only active for more than 30 minutes 33% of the time. These results highlight the marked differences in the duration of active involvement of children with ASD, which are influenced by their psychological condition during training and their difficulty in breaking out of a mental state that prevents them from exercising for the whole session. These visible variations in their engagement during training are a typical aspect of the behaviour of young people with ASD. Coaches and sports psychologists need to understand the needs of young people and the reasons for passivity and refusal to exercise. They have the ability to wait for the right momentum to continue the activity after a break caused by fatigue or psychological crisis. A third variable relates to the staff's knowledge of the children's preferred exercises, in order to use it as a motivation tool to increase commitment and restart training after a break (Figure 2).

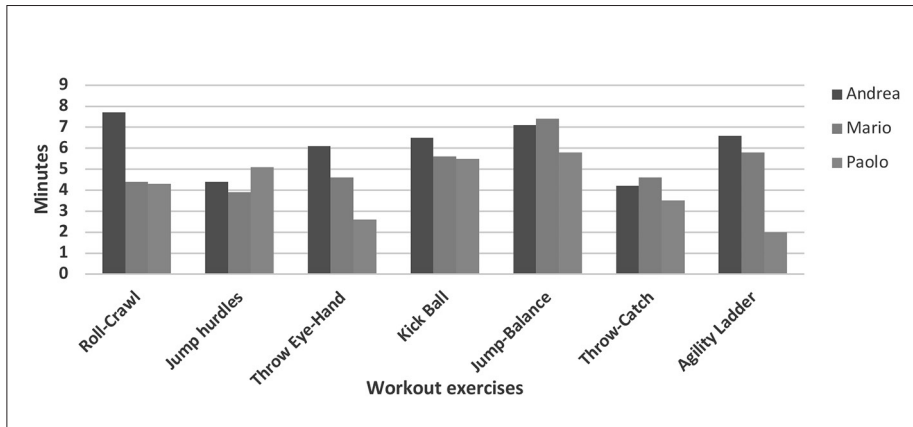


Fig. 2. - Yearly average minutes for each exercise.

The 3 children's favourite stations and exercises were Kick the Ball and Jump-Balance, and they spent between 5 and 7 minutes practising them. In addition, Andrea was involved for at least 5 minutes in 5 out of 7 stations, with a peak of 7 minutes in the Roll-Crawl exercise. Mario's favourite exercise was Jump-Balance and the latter was also Paolo's favourite, together with Kick the Ball. These two children, Mario and Paolo, were only involved for more than 5 minutes in 3 of the 7 exercises proposed, although in general Mario was physically involved for more time in each exercise than Paolo.

PSYCHOLOGICAL DEVELOPMENT

For a more complete evaluation in this section, we present the psychological assessment made by the sports psychologists through the observation form.

Andrea

He spontaneously showed the ability to catch the other's gaze and imitate the coach's proposal. Through imitation, Andrea shows that he is acquiring new skills and knowledge. At the end of the year, his imitation process was extended to include the behaviour of his teammates, demonstrating the social function of this psychological skill, with which he engaged in social and emotional exchanges with others. Andrea did not develop collaborative play with his teammates and imitative performance was the only way to engage in peer interactions. Regarding social skills, he shared activities with his personal coach (passing the ball). Andrea's attention was activated by his coach through physical stimulation, such as tickling or running together.

These behaviours demonstrated how imitation is linked to symbolic functioning and provided him with information about intentions and actions in the social world. At the end of the one-year programme, Andrea's parents noted important progress especially in social skills, demonstrating his ability to generalise the skills achieved during the training to his daily life. These acquisitions were observed mainly through the improvement of two specific social skills: sharing activities with another person and relating to teammates. Social skills have a direct impact on his attentional skills, because he can learn through peer observation, as his parents confirmed: "After being at the stadium with us, Andrea, a non-verbal autistic child, enthusiastically repeated - Roma! Roma! He likes the AS Roma uniform; his classmates ask him where he bought it and the other parents ask us the same. He couldn't answer but we could and we're proud to say that our son plays football in the Roma football school". Now, after watching these matches at the stadium, he cheers for Roma even when he watches the games on television. His mother said during the final interviews: "My son was given the opportunity to acquire skills that he could export and use in other social contexts. This has made him more confident, more integrated, and happier".

Mario

At the beginning of the year, Mario showed frequent oppositional behaviour, often running away from the camp. In the following months, he began to show interest in others. The relationships with others became the fundamental tool to improve his attentional processes. Over time he became able to indicate to his coach what he needed to calm down. His attentional difficulties were managed through short activities with a precise goal. Mario would only say one word at a time (e.g. running, jumping, kicking, ball) and a very short sequence of words for automatic routines such as counting or starting the action: "1, 2, 3, go". He shared the excitement and joy in different activities with different people in the camp, not only with his coach. Mario was aware of and understood the coach's facial expressions for approval and reassurance. He learned to carry out short activities independently, demonstrating his ability to perform exercises involving collaboration with his teammates. He also demonstrated his ability to pass the ball and take penalties. Mario has shown progress in both social skills and attention. Participation in a structured activity has stimulated his responsiveness, confirmed by his parents with these words: "He likes going to the field, and he even wears the AS Roma uniform at school." Mario participates in and completes the activities proposed by the coach. His improvement in the attentional area has

also had effects in the social area. The reduction of oppositional behaviour has allowed him to share activities with his classmates. At the end of the final interviews his parents declared: "During this year, Mario has become less oppositional and more collaborative, not only in football, but in all the activities outside of training".

Paolo

Paolo has the most severe diagnosis among the three children. At the beginning of the training year, he had none of the skills assessed by the observation form. To communicate, he usually used cards drawn by his caregiver to express his needs, feelings, and the activities he wanted to do. During the year, Paolo was followed by a coach who worked intensively to develop his motor activity by stimulating his attention on the current task and on relationship skills. Paolo was very disturbed by the noise of the camp and the presence of more than three people around him. Throughout the programme, he has improved his sensory processes, as evidenced by his ability to tolerate multisensory experiences (visual, auditory and tactile sensory input). This particular ability is the first step that allows him to be on a football field with other adults and peers. He has increased eye contact with his coach but has not interacted with peers. His motor skills increased but his abilities continued to be very weak. His interpersonal skills improved to the point that he entered the football field independently and remained close to the other children even though he did not interact with them. When Paolo started the programme, he could not stay in a designated area. Now he is more focused and shows greater interest in his surroundings. He is now able to listen, process, and perform some short tasks if he is stimulated and accompanied. Because he has improved in communication, he is much happier in the field than before. He is able to direct his gaze to the faces of the trainers and smile. Paolo recognises the other person and shows a desire for contact through kisses and hugs. Despite this progress, he often relies on negative behaviour to get attention. Paolo's parents notice progress, especially in social skills. He explicitly shows positive emotions when his parents show him a drawn card, indicating that it is time to go to football. His mother said: "We have noticed that when we show him the field card, he smiles". With regard to attentional skills, Paolo's parents said he has developed an increased understanding, thanks to the constant work of the coaches. He has acquired skills, including recognition and demonstration of contact. He practices these skills by sharing activities with his referent (passing the ball with his hands or feet). His mother revealed that: "Through the use of the ball, he was able to approach others and start a relationship".

Paolo, due to his severe diagnosis, shows small progress but nonetheless very important progress for a child with such severe symptoms.

Conclusion

In this study, we evaluated the effectiveness of using a motor training circuit, oriented towards teaching football, to improve psychosocial skills in children with severe ASD. The data shows that, in relation to the activity performed on the field, the three children with ASD: 1. participated in between 75% and 70% of the training sessions; 2. spent varying times being physically active during the sessions; 3. spent varying times on each exercise. Only Andrea was active on 5 of the 7 exercises for more than 5 minutes, while the other two children were active for this time on only 3 of the 7 exercises. These results confirm the difficulties for children with ASD to attend sports training and to be physically active for the duration of the training. It is important for coaches and psychologists to be aware of these difficulties when organising a sports programme for children with ASD. Through being aware of these difficulties, they will know how to maintain contact with the children's parents in the case of absences from training and how to react to pause phases due to fatigue and avoidance of exercises the children enjoy less. Working with these children with ASD teaches coaches and psychologists the importance of respecting their rhythms, the need to take breaks of a few minutes during training, and to be proactive even when they try to extend the break or do not seem interested in the proposed exercise. Regarding the development of attentional and social skills, the three children, while performing the same activity, improved by using different approaches and exploiting the relationship with the coach in different ways. Andrea, through the imitation of the behaviour of his peers, has improved interpersonal relationships. However, he did not play with other children. It was a first step, but it is not possible to know if and when he will take another step forward. Compared to the beginning of the year, he has learned to interact with his coach. Over time, the continuous stimulation of Andrea by the coach has led to a breaking of the screen that separates him from the other person. The coach's constancy in regularly seeking interaction with him during each session has resulted in a greater emotional closeness between them. Mario started with a different psychological condition, characterised by oppositional behaviours. In the same way as Andrea, the coherence of the coach's teaching behaviour allowed him to establish a collaborative relationship with Mario, thus reducing the urge to escape from training. It should be noted that with the ASD child, improvement occurs first in the relationship with the coach, and

only later with his peers. Paolo's improvement also came through an improved relationship with the coach, which allowed him to develop a better relationship with his body and to accept the multi-sensory environmental conditions in which training takes place (e.g. being with others on the same pitch, sounds, and weather conditions). Overall, parents said that the children were happy to participate in the training programme, to be involved in this practice, and to wear their AS Roma uniform to school.

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