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A Relationship of Some Motor Skills and Accuracy Performance of Instantaneous Situations in Football

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ABSTRACT:

Therefore the aim of this study was to assess whether a Football Training Program taken over 6 months would improve motor and cognitive performances among football players. Motor skills concerned coordinative skills, running, and explosive legs strength. Cognitive abilities involved visual discrimination times and visual selective attention times. The participants were divided into two groups: Group 1 (*n* = 11) attended a Football Exercise Program and Group 2 (*n* = 11) was composed of Control Group. Their abilities were measured by a battery of tests including motor and cognitive tasks. Football Exercise Program resulted in improved running, coordination, and explosive leg strength performances as well as shorter visual discrimination times in children regularly attending football courses compared with their sedentary peers. On the whole these results support the thesis that the improvement of motor and cognitive abilities is related not only to general physical activity but also to specific ability related to the ball. Football Exercise Programs is assumed to be a “natural and enjoyable tool” to enhance cognitive resources as well as promoting and encouraging the participation in sport activities from early development.

Keywords: Cognitive abilities, Exercise, Football players, Motor skills, Sport activities

INTRODUCTION:

During the last decades, movement development has been intensively researched by a whole approach integrating the growth and the coordination of motor, sensory, and cognitive abilities with respect to the neural maturation in different regions of

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the brain (Davis et al., 2011). Coherently, a multidisciplinary approach has been employed. This has required the interaction of different disciplines such as kinesiology, developmental psychology and neuroscience, which, historically, have had little contact despite investigating similar issues (Best, 2010). Currently, there is renewed interest, supported by wide empirical evidence, aimed to show the close relationship between motor development and cognitive functions (Chomitz et al., 2009; Haapala, 2013; Alesi et al., 2014a). Indeed the causal link between regular physical activity and brain growth in the prefrontal cortical area (Best, 2010) represent the crucial point.

This close relationship finds a plausible explanation in the executive function hypothesis assuming that exercise training sessions influence a significant rise in gray matter volume and a prolonged increase of myelination and connectivity between age 7 and young adulthood in pre-frontal and frontal cortex. The refinement of cortical network in this area improves student's components of executive abilities: speed and accuracy of processing, strategy employ, working memory, and response inhibition (Diamond, 2011; Diamond and Lee, 2011). Human movement is an expression of human personality, because it associates psychological components and physical structures. A motor skill is a learned sequence of movements that combine to produce a smooth, efficient action in order to become expert in specific goal-directed tasks (Farhat et al., 2015). A child must receive many opportunities to have motor experiences and improve motor coordination in order to develop successfully motor skills. In turns, motor coordination is the harmonious functioning of body parts that involve movements, including gross motor movements, fine motor movements, and motor planning. The first ones require the use of large muscle groups to perform tasks like walking, balancing, crawling. Much of the development of these skills occurs during early childhood and the performance level of gross motor skill remains unchanged after periods of non-use. Conversely, fine motor skills requires the use of smaller muscle groups to perform tasks that are precise in nature. Activities, like kicking the ball, playing the piano or writing, related with technical skills, are examples of fine motor skills. Finally motor planning is the ability of the brain to plan and execute a sequence of unfamiliar actions or non-habitual tasks.

So researchers and practitioners have increasingly worked to clarify the reason that physical and sport activities are suitable to influence cognitive development in student. It's largely recognized how complex motor tasks, involving coordinative exercises, are more closely related to student's cognitive functioning than simple motor tasks. Coordinative abilities are traditionally recognized to stimulate the activation of the cerebellum effecting on working memory as well as on the speed and accuracy of attention tasks.

In this perspective, football has revealed to be a physical activity able to improve both motor and cognitive growth respectively carried out research on the cognitive resources of young football players. They stated that student playing football need to order, classify and group information they perceive; consequently they improve their ability to understand the connections between information and apply formal thinking. So at the very early age football players are not only able to react to the actions during the game and use technical rules, but they train tactical-cognitive abilities, which in turns, contribute to improve their cognitive profile. Football stimulates not only simple technical elements during training sessions but also motor and cognitive growth, specifically attention abilities. Players are required to respond quickly and accurately to the actions during the game and continuously evaluate and monitor the match situations. Simultaneously they need to keep in mind all the elements that have already occurred. Therefore, sophisticated levels of thinking are required by the special movements of football; the player analyzes the changing play situations by using his perceptual abilities and realizes them by using his cognitive abilities; consequently, he decides and executes his decision by using his technical and kinetic abilities. Already at 9 years-old football players show reduced reaction times and more increased decision-making abilities than their sedentary peers.

In light of these theoretical considerations, the aim of this study was to investigate whether a Football Exercise Program taken over a 6-months period would improve motor and cognitive performances of student aged 9 < 10 years. It was hypothesized that student regularly attending the football course obtained higher gains on motor skills such as running, coordination skills and explosive leg strength as well as cognitive abilities such as visual discrimination times and visual selective attention times, than their sedentary peers. A further aim was to assess the link between motor skills and cognitive abilities in student practicing football and sedentary student. It was hypothesized a closer link between the above-mentioned abilities in the group composed of student regularly attending the Football Exercise Program.

Direct free kick rule

Direct free kicks are also known as one touch kick, since only one touch is required for a goal to be awarded. This kick should always be taken at the spot where the offence took place, and the ball should always be in a stationary position when taking the kick. A player can kick the ball straight into the goal from a direct free kick. However, when an offence worth of a direct free kick is committed inside the penalty region; a penalty kick is awarded instead.

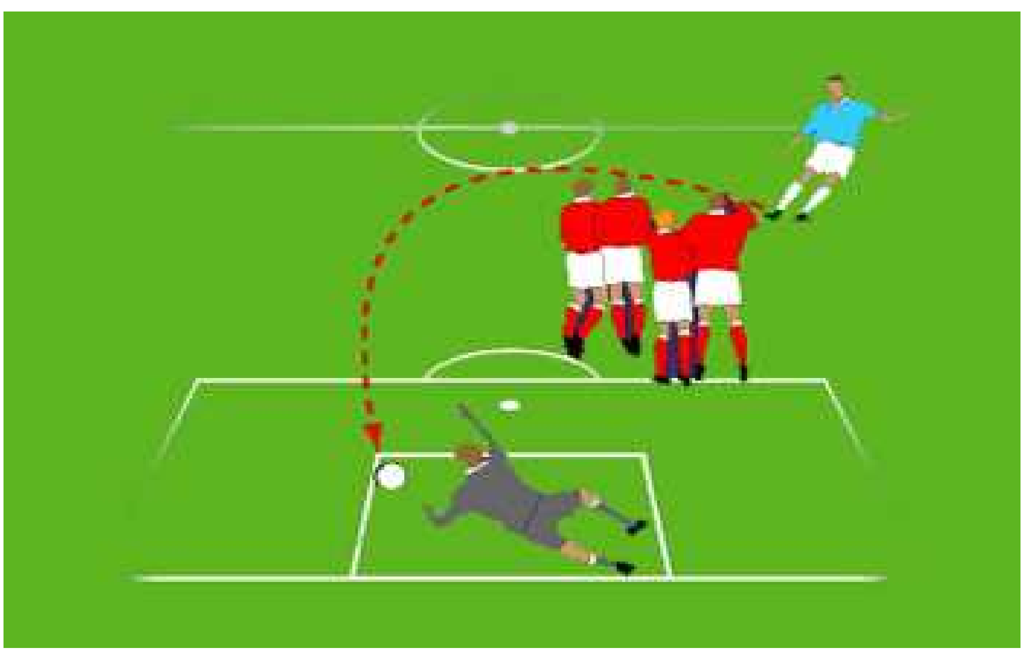

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Figure 1: Direct Free Kick

Indirect free kick rule

Indirect free kick is given to the opposing team when a player commits a foul other than a penalty oneThe rule of indirect free kick states that, a player cannot score a goal straight from the kick. The indirect free kick rule was derived from the Sheffield rules that stated that no goal could be scored from this kind of free kick. The rule was absorbed into the Laws of Game in 1877. Generally, an indirect free kick is given to the opposing team when a player commits a foul other than a penalty one (dangerous play) or violates certain technical requirements of the football rules.

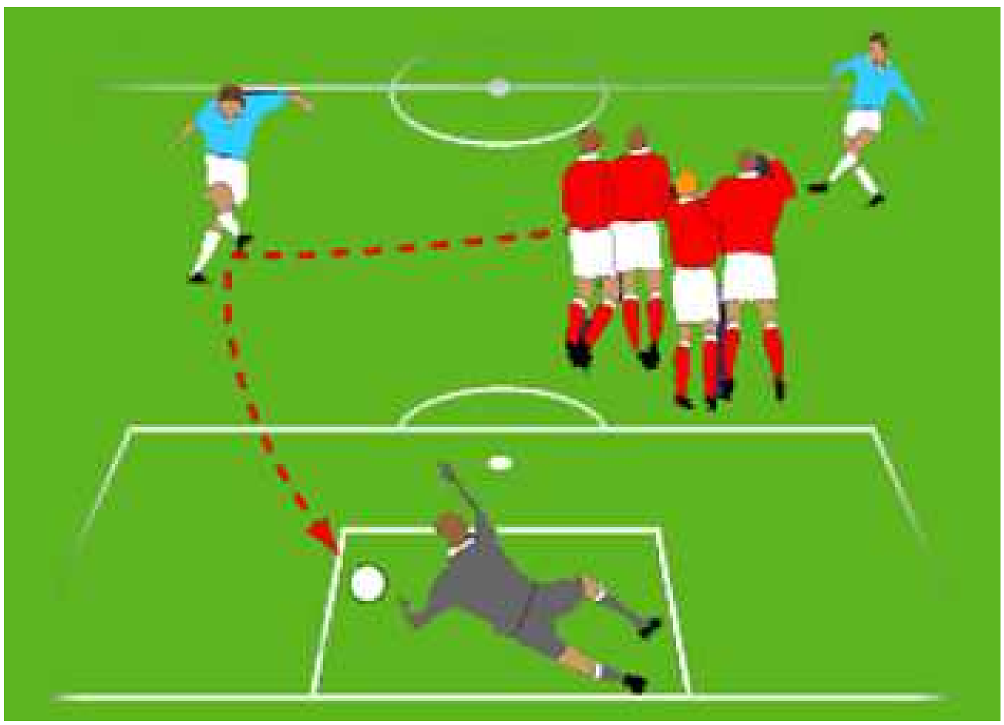

Figure 2: Indirect Free Kick

MOTOR SKILLS:

Motor skills are actions that involve the movement of muscles in the body. They are divided into two groups: gross motor skills, which are the larger movements of arms, legs, feet, or the entire body (crawling, running, and jumping); and fine motor skills , which are smaller actions, such as grasping an object between the thumb and a finger or

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using the lips and tongue to taste objects. Motor skills usually develop together since many activities depend on the coordination of gross and fine motor skills.

Motor skills develop over a relatively short period of time. Most development occurs during childhood. However, soldiers, some athletes, and others who engage in activities requiring high degrees of endurance may spend years improving their level of muscle and body coordination and gross motor skills.

Figure 3: Motor Skills

Developing motor skills:

Due to the immaturity of the human nervous system at the time of birth, student grow continually throughout their childhood years. Many factors contribute to the ability and the rate that student develop their motor skills. Uncontrollable factors include: genetic or inherited traits and student with learning disorders. A child born to short and overweight parents is much less likely to be an athlete than a child born to two athletically built parents.

Controllable factors include: the environment/society and culture they are born to. A child born in the city is much less likely to have the same opportunities to explore, hike, or trek the outdoors than one born in the rural area. For a child to successfully develop motor skills, he or she must receive many opportunities to physically explore the surroundings. Infantile: Early movements made by very young infants are largely reflexive. An infant is exposed to a variety of perceptual experiences through the senses. Gradually, the infant learns that certain involuntary, reflexive movements can result in pleasurable sensory experiences, and will attempt to repeat the motions voluntarily in order to experience the pleasurable sensation.

- 6 months – can sit straight
- 12 months – takes first steps
- 24 months – can jump
- 36 months – can cut with scissors; runs on toes

Stages of motor learning

The stages to motor learning are the cognitive phase, the associative phase, and the autonomous phase. Cognitive Phase: When a learner is new to a specific task, the primary thought process starts with, "What needs to be done?" Considerable cognitive activity is required so that the learner can determine appropriate strategies to adequately reflect the desired goal.

Good strategies are retained and inefficient strategies are discarded. The performance is greatly improved in a short amount of time. Associative Phase: the learner has determined the most effective way to do the task and starts to make subtle adjustments in performance. Improvements are more gradual and movements become more consistent. This phase can last for a long time. The skills in this phase are fluent, efficient and aesthetically pleasing. Autonomous Phase: this phase may take several months to years to reach. The phase is dubbed "autonomous" because the performer can now "automatically" complete the task without having to pay any attention to performing it. Examples include walking and talking or sight reading while doing simple arithmetic.

The Law of Effect

Motor skill acquisition has long been defined in the scientific community as an energy-intensive form of stimulus-response (S-R) learning that results in robust neuronal modifications. In 1898, Thorndike proposed the law of effect, which states that, the association between some action (R) and some environmental condition (S) is enhanced when the action (R) is followed by a satisfying outcome (O). For instance, if an infant motions his right hand and left leg in just the right way, he can perform a crawling motion, thereby producing the satisfying outcome of increasing his mobility. Because of the satisfying outcome, association between being on all fours and these particular arm and leg motions are enhanced. Further, a dissatisfying outcome (O) weakens the S-R association. For instance, when a toddler contracts certain muscles, resulting in a painful fall, the child will decrease the association between these muscle contractions and the environmental condition of standing on two feet.

Feedback

During the learning process of a motor skill, feedback is the positive or negative response that tells the learner how well the task was completed. Inherent feedback: after completing the skill, inherent feedback is the sensory information that tells the learner how well the task was completed. A basketball player will note that he or she made a mistake when the ball misses the hoop. Another example is a diver knowing that a mistake was made when the entrance into the water is painful and undesirable. Augmented feedback: in contrast to inherent feedback, augmented feedback is information that supplements or "augments" the inherent feedback. For example, when a person is driving over a speed limit and is pulled over by the police. Although the car did not do any harm, the policeman gives augmented feedback to the driver in order for him to drive more safely. Another example is a private tutor for a new student of a field of study. Augmented feedback decreases the amount of time to master the motor skill and increases the performance level of the prospect. Transfer of motor skills: the gain or loss in the capability for performance in one task as a result of practice and experience on some other task. An example would be the comparison of initial skill of a tennis player and non-tennis player when playing table tennis for the first time. An example of a negative transfer is if it takes longer for a typist to adjust to a randomly assigned letters of the keyboard compared to a new typist. Retention: the performance level of a particular skill after a period of no use.

STATEMENT OF THE PROBLEM

To study the role of motor skills among football player in football sport and the relation of motor skills in accuracy goal making in football sport by football players. To compare and present the motor skills relation to accuracy among football players.

SAMPLE:

Forty-six student with age 23-28 years (*SD* = 1.29) voluntarily participated in this study. The student were subdivided into two groups: first group (Group 1) was composed by 11 (94.2%) student regularly attending football courses, motor skill training and second group (Group 2) was composed of 11 (46.8%) sedentary student; anthropometric measures showed**.** Both groups were composed of males, being football a predominant masculine sport. Football student were recruited and sedentary student in their colleges. Prior to the start of the study, each participant's parents provided written informed consent. Moreover, appropriate local ethics committee approval was obtained from the Osmania University.

Table 1: Descriptive statistics for age and BMI in the football and sedentary groups.

Subjects	**Age (years)**	**Weight (kg)**	**Height (cm)**	**BMI (kg·m^{-2})**
Football group (*n* = 11)	22.78 ± 1.13	65.21 ± 10.98	1.34 ± 8.33	16.04 ± 8.54
Sedentary group (*n* = 11)	23.41 ± 0.96	70.48 ± 10.17	1.40 ± 9.83	21.10 ± 3.76

Anthropometric measures for both groups related to: age – body weight – body height – body max index (BMI).

PROCEDURES

A longitudinal method research was employed. Specifically, this research design included: the pretest evaluation (T0) aimed at measuring motor and cognitive abilities; the Football Exercise Program; the post-test evaluation (T1) after 6 months of training in which tests for motor and cognitive abilities were repeated. At the pre-test and at the post-test phases, two measurement sessions were realized: (1) physical/motor session; (2) cognitive session. The second session was carried out over 2 weeks. Children were assessed in the school and gym context twice, the pretest given in November, and the post-test given in May in the same year at the same day-time (2–4 p.m.) to avoid circadian effects. At the pretest phase, motor and cognitive abilities were assessed. After the pre-test, the subjects of Group 1 took part in a structured Football Exercise Program, which included several exercises to improve their coordination with an exciting and enjoyable approach, rather than focusing on competition or skill enhancement. Sedentary children didn't practice any sport activity. After the Football Exercise Program, the post-test phase included a re-evaluation of motor and cognitive abilities.

ANTHROPOMETRIC AND MOTOR ASSESSMENT

Height and body weight (BW) were measured according to standardized practices recommended at the Airlie Conference. Body mass index (BMI) was calculated as BW divided by height squared ($kg \cdot m^{-2}$). Motor skills were tested by a battery including 20-m Sprint test, Skill test and Standing board jump test. The 20-m Sprint test assessed children's running skills. Children were asked to linear sprint on a 20 m flat fixed with marker cones and the time was expresses in second. The Skill test assessed children's coordinative skills along a circuit with hurdles: from the starting line the child had to overcome a central cone, turn right and reach the first obstacle of 50-cm in height, overcome with a leap and immediately go under the same in the opposite direction, return to the central cone and repeat the procedure in the four cardinal directions. Children were asked to

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complete this circuit as fast possible and without errors. The score was- expressed in second calculated by stop-watch.

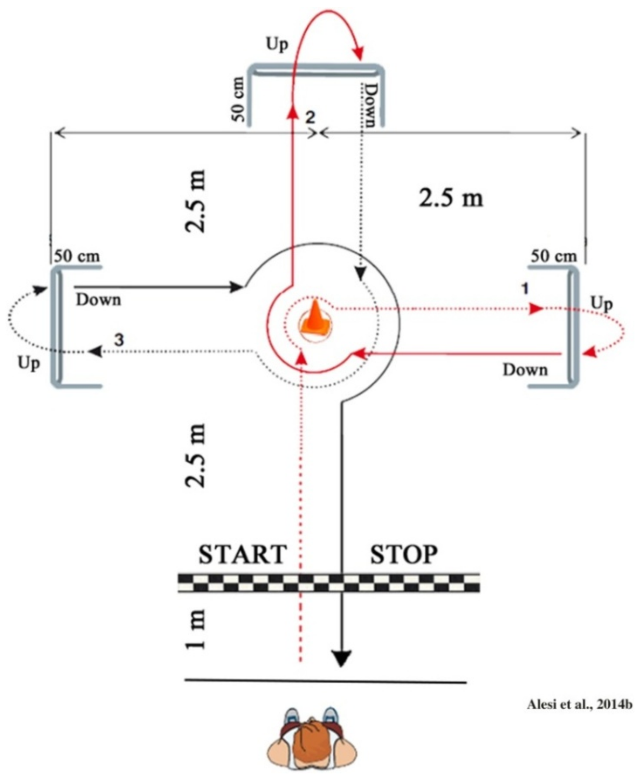

Figure 4: Motor Skill Test

The Standing board jump test assessed the explosive leg strength. Children were asked to jump horizontally as far as possible landing with both feet from a standing position. The score was the longest of three trials. The jump was repeated if children failed or took a step at take-off. For all tests the equipment included meter, clipboard, recording sheet, and pencil ready for the assessment.

Cognitive Assessment

Cognitive abilities were tested by the Visual Discrimination test and Visual Selective Attention test derived from the Italian Neuropsychological Battery BVN 5-11. The Visual Discrimination test assessed the ability to identify correctly stimuli by finding likenesses and differences in stimuli. Given a target, children were asked to recognize all similar figures within a matrix of nine shapes. The underlying processes of perceptual organization were details recognition in visual images, perceptual grouping, figure-ground segregation and global-local processing. Frequent errors were reversals, omissions, and additions in the figure recognition. The score was the execution time indicated in seconds. The Visual Selective Attention test was a paper-and-pencil canceling task, an object decision task aimed at evaluating the object knowledge and recognition. Children were asked to select and cross out targets as quickly as possible (within 1 min). Targets were geometrical shapes represented by squares with two lines inside and were embedded in a frame containing 64 randomly positioned items of which 52 are distractors. Distractors were squares sharing 0 or 1 feature with the target. At first a sample was presented to children to ensure that the instructions were clear. The score was the execution time indicated in seconds.

FOOTBALL EXERCISE PROGRAM

The Football Exercise Program consisted in 75-min sessions, twice a week with 2 days in between, for 4 months. Each session involved the following stages: – for 10 min, the central training period divided into three parts (individual skills, technique or/and 1 vs. 1 man, opposed games 3 vs. 3/5 vs. 5) exercises for 60 min, and cool down for 5 min. The warm-up phase included a 4-min dribble while walking, circular passing with jogging or kicking the ball against wall, and 6-min of a structured play to improve the motor awareness, control, and coordination without stretching. The main exercise phase was arranged to allow children to progress from simple to complex and from low to high intensity. These included exercises to improve individual play techniques and develop the creativity of youth players. The cool-down phase consisted in stretching exercises while discussing the main course themes. Sessions were multipurpose in order to develop different aspects of the game in the same session. The exercise program was performed by a soccer-certified teacher.

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Table 2: Football Exercise Program.

Phase	Activity	Minutes
Warm-up	∘ 4-min dribbles while walking	
	∘ 6-min of a structured play	10
Training	∘ Individual skills	
	∘ Technique or/and 1 vs. 1 (man to man)	50
	∘ Opposed games 3 vs. 3/5 vs. 5	
Cool-down	∘ Stretching exercises while discussing the main course themes	5

Movement at the Hips For the squat, a strength coach will regularly use cues like weight on your heels, sit back in a chair, don't let your knees travel forward past your toes, keep chest up, and abdominals tight. All of those things promote the "hip hinge" position that forces the posterior chain to do the work. A squatting/lunging/lowering exercise should not begin with a bend of the knees. It should begin with a hinge of the hips (think of moving at the hips first and try to keep the lower leg vertical).

You need strength, but you need it in the right places.

Due to their natural strength and the leverage advantage they have over your leg muscles, the glutes should always be the primary muscles that drive lower body movement.

Exercises for training muscles for volleyball developing healthy shoulders...

- **Scapulae stabilizer exercises.** Shoulder exercises like I's, T's, and Y's, internal/external rotations, etc can go a long way to improving shoulder health and function.
- **Horizontal pulling variations.** Think of pulling BACK, or retracting the scapulae.
- **Vertical pulling variations.** Think of squeezing the scapulae DOWN, or depressing the scapulae.
- **Push up variations.** Pushups are important because pushups recruit and strengthen the serratus anterior. Also, pushups on an unstable surface such as a balance ball will help activate

shoulder stabilizer muscles and the abs.

BROAD JUMPS

An explosive jump is extremely important in volleyball, especially between hitting, jump serving and blocking. Broad jumps will help with all three of these skills.

- To begin, mark off an area around 15 yards. Start with feet shoulder width, knees slightly bent, and arms positioned at the side of the body.
- Keep feet parallel and even with one another, then squat down and swing both arms back in unison while jumping for distance.
- Both feet should land at the same time in a balanced shoulder width positioned. Once landed, they should repeat the same broad jump motion.
- This exercise can be done in 6 sets with 10 forward broad jumps in each set.

Figure 5: Broad Jumps

SKI JUMPS

In volleyball, agility is a key component when transitioning from defense to offense and skill to skill. An exercise that can help with agility is ski jumps.

1. Find a line, either on a field or a court, fifteen yards long.
2. Start on the balls of the feet with both feet touching the inside of each other.

3. Proceed to jump from side to side over the line and move forward while jumping; feet should stay together.

To add to this exercise, go forwards then backwards or also jump on one foot. Begin with six sets of fifteen yard ski jumps.

Figure 6: Ski Jumps

When training, preparing, and coaching defensive linemen, it's important to remember that the American football defensive lineman is one of the more unique athletes on the face of the earth. It has long been said that the average football lineman engages in the equivalent of approximately. The American football defensive lineman *initiates* these collision type crashes from 1–2 yards away, all while having the responsibilities of disengaging and pursuing the ball carrier. These dudes definitely earn their pay. Because of this unique responsibility/requirement, strength and conditioning coaches must consider programming that will equip the athlete for all of this. I've listed some exercises we do to prepare our linemen for their season, but first let's look at the list of requirements placed on the defensive lineman for an average play.

1. Initiate collision and absorb impact.
2. Drive against one or sometimes even two offenders at one time.
3. Disengage the blocker and pursue the ball.
4. Tackle the ball and/or whoever has it.

All of these items require power, raw strength, speed, agility, superb conditioning, and overall mental toughness! With this in mind, here are my (I hate the term 'best') favorite five exercises for building a dominant defensive lineman.

Heavy trap bar deadlift: The reason this is number one is because of the initial burst of raw power needed to move the bar. This pre-coiled position teaches good bend and helps develop explosive hips as the athlete moves the bar vertically. No trap bar? No problem! Use a medicine ball. Hold it in front of your chest (like you were doing a chest pass). Assume the pre-coiled squat position, and on command, explode vertically, pressing the ball as high as humanly possible while jumping as high as possible. Land with good posture and repeat.

Figure 7: Heavy trap bar deadlift

Kneeling medicine ball coil press and push-up: This exercise is great for using the hips and upper body power. It teaches the similar mechanics as the defensive linemen use in horizontal pressing. Best of all, it teaches how to absorb impact in the chest and shoulders. The emphasis on falling to the floor and exploding back to an upright kneeling position is the key!

Up-hill truck push: The up-hill feature adds the element of the "fight back." All too often, defensive linemen practice pushing something that doesn't push back. Well, in every game I've ever played in, the offensive linemen pushed back. If you use a slight (and I mean very slight) hill or slope, the truck will still budge, but it will most certainly push back if you don't use proper leverage. Pushes on a flat surface aren't any good because momentum takes over and the vehicle rolls on its own. So a 5–10 degree slope is best.

Push-up sprints with pursuit: Have the athletes start on the ground in the push-up position. Then have them push up directly to their feet and begin a 5–10 yard sprint. After that, have them stop, redirect, and sprint to an area of choice (sort of like a pursuit drill seen at football practices all across the country).

One-arm dumbbell row (4–6 second eccentric/1 second concentric action): This exercise may be the simplest but hardest to perform. We're basically using an old school bodybuilding technique to help build mass and strength for the back and shoulders. Because of the high impact collisions that take place, our backs and shoulders *must* be able to withstand the test time after time after time. We perform this for 2–4 sets with heavy weights and low reps (usually 4–7 reps). This exercise may not seem to fit, but performed over time with attention to detail, it can add tons of muscle to the back, which will help the athletes sustain those high impact collisions in every game.

RESULTS

Mean standard deviation and percentages of score gains of the all variables are presented**.** There was no difference between groups at baseline conditions for cognitive and physical test. With concern motor abilities preliminary analyses revealed that football and sedentary groups were equivalent at the pretest evaluation of Agility test [$F_{(1,44)} = 0.100$; $p = 0.722$; $\eta_P^2 = 0.002$] and Standing board jump test [$F_{(1,44)} = 1.829$; $p = 0.255$; $\eta_P^2 = 0.040$].

With concern cognitive abilities preliminary analyses revealed that football and sedentary groups were equivalent at the pretest evaluation of times of Visual Discrimination [$F_{(1,44)}$ = 1.615; p = 0.107; η_P^2 = 0.035] and times of Attention [$F_{(1,44)}$ = 3.558; p = 0.070; η_P^2 = 0.073]. At post-test significant differences between the football group and the sedentary group revealed in Sprint test [$F_{(1,44)}$ = 10.970; $p < 0.01$; η_P^2 = 0.200], Agility test [$F_{(1,44)}$ = 27.526; $p < 0.001$; η_P^2 = 0.385], Standing board jump test [$F_{(1,44)}$ = 15.317; $p < 0.001$; η_P^2 = 0.258] and Visual Discrimination test [$F_{(1,44)}$ = 4.116; $p < 0.05$; η_P^2 = 0.086].

Table 3: Performance variables studied in both groups.

Groups	**Variable**	**Pre-test**			**Post-test**			*F*		**Percentage score gains**
		M	*SD*	**CV**	*M*	*SD*	**CV**	*F*-**value**	*p*	
Football group	Agility (sec)	21.46	6.52	30.38	15.49	2.39	15.43	17.685	<0.05	27.82%
(n = 24)	Sprint (sec)	4.29	0.40	9.32	4.07	0.24	5.89	5.332	<0.05	5.13%
	SBJ (cm)	118.05	20.18	17.09	125.54	17.81	14.09	1.858	0.179	6.34%
	TVD (sec)	58.64	16.08	27.42	47.08	9.20	19.54	9.420	<0.05	19.71%
	TVSA (sec)	57.96	11.49	19.82	54.74	15.37	28.08	0.692	0.410	5.56%
Sedentary group	Agility (sec)	20.86	6.15	29.48	19.56	2.8	14.31	0.820	0.370	6.23%
(n = 22)	Sprint (sec)	4.63	0.31	6.69	4.37	0.35	8.01	6.754	<0.05	5.62%

	SBJ (cm)	110.13	19.43	17.64	104.83	18.05	17.21	0.880	0.354	4.81%
	TVD (sec)	65.91	22.87	34.70	56.77	21.35	37.61	1.876	0.178	13.87%
	TVSA (sec)	76.63	48.28	63.01	61.05	20.68	33.87	1.961	0.169	20.33%

Values as mean ± SD, coefficient variation (CV), Fisher (F) values and percentage score (%) gains for: Agility test, Sprint test, Standing Board Jumping test (SBJ), Times of Visual Discrimination (TVD), Times of Visual Selective Attention (TVSA).

Specifically, in the football group significant improvements were found from pretest to post-test in scores at the 20 m Sprint [$F_{(1,44)} = 5.332$; $p < 0.05$; $\eta_P^2 = 0.104$] and the Agility test [$F_{(1,44)} = 17.685$; $p < 0.01$; $\eta_P^2 = 0.278$]. On the contrary, in the sedentary group weren't found differences in scores at the Agility test [$F_{(1,44)} = 0.820$; $p > 0.05$; $\eta_P^2 = 0.019$] and Standing board jump test [$F_{(1,44)} = 0.880$; $p = 0.354$; $\eta_P^2 = 0.021$]. Only at the Sprint test significant differences were found [$F_{(1,44)} = 6.754$; $p < 0.05$; $\eta_P^2 = 0.013$]. Moreover in the football group significant improvements were found from pretest to post-test in scores at the times of Visual Discrimination [$F_{(1,44)} = 9.420$; $p < 0.05$; $\eta_P^2 = 0.167$].

	Questions	**Experimental Group[n=11]**	**Control Group[n=11]**
1.	Do you think u can perform good motor skills?	55	32
2.	Did you have good motor skills?	49	38
3.	Is there a relation between motor skills and accuracy of kick performance	50	48
4.	Will the motor skills help u in performing accurate free kick?	52	46
5.	Will the motor skills help u in performing accurate non-free kick?	51	49

6.	Will the motor skills effect the performance in football?	53	39

Table 4: Questionnaire

The questionnaire states that the experimental group has good knowledge for motor skill performance and they can perform good skills compared to control group.

Looking at percentage score gains gives suggestion of the size of the improvements in motor skills and speed of visual discrimination. In the trained group, times of execution of coordinative circuit improved showing a decrease of 27.82% from pre-test to post-test, whilst in the control group it decreased of 6.23%. Moreover, in the football group, performances in Standing board jump task improved of 6.34% and in the 20 m Sprint of 5.13%. Increases in the control group were smaller; performances in the Standing board jump task improved of 5.62% and in the 20 m Sprint of 5.62%. The time of visual discrimination decreased of 19.71% in the football group and 13.87% in the sedentary group. Finally, correlation analyses showed in the football group positive significant correlations between running skills and Visual Discrimination times or Attention times. Moreover, Standing board jump was significantly and negatively related to Visual Discrimination times.

Table 5: Relationship between performance variables in Football Group.

		(1)	**(2)**	**(3)**	**(4)**	**(5)**
Agility	(1)	1				
Sprint	(2)	0.743ˆ**	1			
SBJ	(3)	-0.677ˆ**	-0.757ˆ**	1		
TVD	(4)	0.177	0.416ˆ*	-0.458ˆ*	1	
TVSA	(5)	0.317	0.473ˆ*	-0.225	0.236	1

*Pearson correlations between Agility, Sprint, Standing Board Jumping (SBJ), Times of Visual Discrimination (TVD), and Times of Visual Selective Attention (TVSA) in Football Group. Significant value was showed with *p < 0.05 and **p < 0.01.*

In the sedentary group the only significant correlation was found between coordinative skills and Visual Discrimination times.

Table 6: Relationship between performance variables in Sedentary Group.

		(1)	(2)	(3)	(4)	(5)
Agility	(1)	1				
Sprint	(2)	0.467^*	1			
SBJ	(3)	-0.738^**	-0.762^**	1		
TVD	(4)	0.478^*	0.134	-0.414	1	
TVSA	(5)	0.284	-0.057	-0.303	0.664^*	1

*Pearson correlation between Agility, Sprint, Standing Board Jumping (SBJ), Times of Visual Discrimination (TVA), and Times of Visual Selective Attention (TVSA) in Sedentary Group. Significant value was showed with *p < 0.05 and **p < 0.01.*

	Groups	Accuracy	
		10 Meters	20 Meters
1.	**Experimental Group[n=11]**	**4**	**4**
2.	**Control Group[n=11]**	**2**	**1**

Table 7: Participants results

The research analysis the accurate kick performance by Experimental Group [n=11], Control Group [n=11], and the above table demonstrates the results. The research provides chances for each group to perform 5 free kicks and 5 non-free kicks. The results show that Experimental group performed more accurate kicks compared to control group. Therefore it is clear that motor skill performance depends on the accuracy of kick.

Conclusion:

In conclusion we argue that in our study the improvement of cognitive and motor skills is related not only to general physical activity but also to a specific sport, as well as football, based on the assumption that different sports activities require different sets of skills. At Sprint test, Agility test, and Standing board jump test they showed significant higher skills than sedentary peers, how revealed by large ES for statistical differences between the two groups. Moreover, children regularly attending the Football Exercise Program obtained the largest gain between pre-test and post-test in the agility test, measuring coordinative performance, how shown by the higher ES for statistical differences from baseline to post-test and the decrease of CV from baseline to post-test. This is not unexpected because football improves most speed, rapidity and dynamic balance. Playing football requires that the environment constantly changes and movements have to be continually adapted. A successful player has to show those cognitive abilities called "game intelligence" which involve spatial attention, shared attention, working memory, and metalizing ability.

RECOMMENDATIONS:

A further aim of our study was to assess the association between motor skills and cognitive abilities. Correlation analyses confirmed the feasibility of our study design. As expected, the football group showed significant associations between running skills, visual discrimination times, and attention times. Conversely, visual discrimination times were negatively related to the performance on standing board jump which is a field test muscle mass and muscle characterization dependent, even on that case as expected. This is consistent with the hypothesis that to train running skills is a way to train indirectly cognitive abilities because football skills involve sophisticated cognitive abilities to anticipate team-mates and opponents' behaviors as well as use strategies to adapt to changing task demands.

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