COORDINATION AND MOTOR ABILITIES OF YOUNG PLAYERS FROM FOOTBALL ACADEMIES IN KAVALA

Kyriakos Papadopoulos
Special Education High School, Kavala, Greece, kyripapado2@yahoo.gr
Iliya Kanelov
South-West University "Neofit Rilski", Faculty of Pedagogy, Blagoevgrad, Bulgaria,
i_kanelov@abv.bg

Abstract: Recognition a talented young player may involve some hidden surprises somewhere along the way. As far as concern the General Kinetic Ability, one of the first perceptions of individual differences and human abilities is that all skills are related to a single general factor called general functional ability. In the field of cognitive or intellectual functions, this factor is known as "intelligence" and is hypothetically measured by the IQ. In the field of motor skills there is a similar condition that defines, referred to as "general motor ability". One of them is the motor quality "agility". It is part of all the motor qualities of human, but the main organ that guides him is the central nervous system and the ability to control the movements of body and body parts so as to respond to the changing sporting situation. Agility is an important component of many team sports, though it is not always tested, and is often difficult to interpret results. The Illinois Agility Test (Getchell, 1979) is a commonly used test of agility in sports, and as such there are well established norms available. The main purpose of this study is to determine the level of motor skills of young athletes from Sports Football Academies in the area of Kavala, by applying a Illinois Agility Test (IAT) and to compare the obtained results with the standardized evaluation data, on the basis of which to establish the presence or absence of giftedness on the contingent of research. We surveyed young football players from five leading academies. We used GraphPad Prism version 3.0, for statistical analysis. The study groups have a antropometrichal parameters as follow: age – 16,73±1,04, height – 173,3±0,06 cm, weight - 65,48±9,70, and BMI of 21,9±1,06 (M±SD). The participants of this research completed (IAT) and the results show as the following values: A.O. Kavalas - 17,69 ±1,09 sec; Π.A.O.K. Kavala - 17,96 ±1,50 sec; Apollon Kavalas 17,81±1,35 sec; A.E.K. Kavalas - 17,80±1,49 sec; Kavala 2004 -17,66±1,53 sec (M±SD). The mean values and the standard deviation of the whole studied contingent is 17,78±0,1184 (M±SD). The results of all five teams are similar and do not difference statistically significantly (P>0.05, Kruskal Wallis test, One Way ANOVA). This result compared with the standard evaluation system, Davis, Phillips, Roscoe, Roscoe, and Davis (2000), shows us that young footballers have an Average level of development of Agility skills in the range 16.2 - 18.1 sec. Analyzed personally, only 4 (6,7%) young players have a result Excellent in the range less to 15.2 sec., 6 of them (10%) have score Above Average (15.2 - 16.1sec), Average (16.2 - 18.1sec) and Below Average (18.2 - 19.3 sec) have 23 participants (38,3%) and the others have a Poor result 4 (6,7%; 19.3< and more sec). According to the results the team with the highest score mean was A.O. Kavalas. However, only 6.7% of the participants performed excellently. Moreover, the coaches of these teams agreed that these 4 children seem to be more talented than the average. The limitations of the study are regarded to be the small sample. In future we suggest, coaching staff to use more agility tests and their variants for recognize on gifted young players and their individual abilities from the football academies of Greece.
Keywords: agility, motor skills, gifted children, football

1. INTRODUCTION

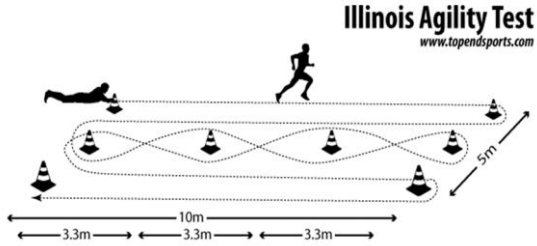
Although general motor skills seem to have no basis, there are several people who do really well in several skills that are similar to each other. That is to say, there are many athletes who are good at several sports and this leads to the conclusion that this implies a general motor ability. This tendency, however, may be due to the fact that some parents, unlike others, support their children's sports activities leading them to gain experiences that help them to have a successful performance in different sports. Of course, experience and training create skills, making children participate in clubs, where they practice more. It is obvious that parents and children who do not put such emphasis will not have the same attitude towards sports and, therefore, this will affect their performance. Also, the appeal in many sports may be due to the body type that may affect success in many sports activities. Growth rate can also affect performance and thus taller and stronger children, who mature prematurely, have an advantage in most athletic skills. This, in turn, leads to more engagement, because success is a motivation to engage in all of these skills and gives the impression of general motor ability. Finally, it is risky to draw conclusions about the nature of the skill used, observing only some of the most famous and well-trained athletes in the world. These individuals are more than normal "gifted" in most of the special skills needed in their sports and, thus, the perception of general motor ability is not validated.

In short, the myth about the multi-athlete is created by the following factors:
•different support from parents for sports and physical activities, gives different levels of experience
•general factors of body size or growth rate tend to favor taller, stronger and prematurely mature children in most sports
•general personality traits, such as e.g. competitiveness, can contribute to some sports activities.
Athletic excellence or excellent performance is the goal of all coaches and practitioners. Excellent performance in sports is the constant excellent performance which is maintained over an extended period of time (Kioumourtzoglou, Michalopoulou, Tzetzis, & Kourtessis, 1998). To reach athletic excellence, athletes must excel in four areas:
•in the normal field
•in the technical field
•in the field of perception
•in the emotional realm.
The highest degree of correlation found between deep support and lateral support was very low (r = 0.31). All other correlations were lower than this and range from 0.03 to 0.26. Even this, the highest correlation of 0.31 means that there is only a 9.6% common rate between these two tests, which means that at over 90%, the skills tested by the two tests are different. The general mobility argument is further weakened if one considers that in this study there are all the balance tests, which measure a relatively small range of human mobility. It seems that there is no general balance ability, because every balance test would be premium. What is found is that each test measures individual abilities to control posture. Therefore, it is difficult to support the hypothesis of general motor ability for all motor skills. Similar results were found in the collection of skills that measure the speed of movement in common points), although the tests were similar to each other. If one examines all the existing literature one finds no evidence to support the view that motor skills are organized by a single general motor ability. This evidence does not argue against the ideas of abilities themselves but against the idea that there is only one such ability. The following conclusions can be drawn regarding the correlations between the aptitude tests that support
motor skills:
•the correlations between different skills are generally very low
•even skills that seem quite related to each other have a low correlation rate,
•this total lack of correlation between skills is against the notion of a general motor ability
•on the other hand, two skills with only small differences, e.g. 10 and 15 m., may have a high correlation coefficient.

2. MATERIALS AND METHODS

The main purpose of this study is to determine the level of motor skills of young athletes from Sports Football Academies in the area of Kavala, by applying a Illinois Agility Test (IAT) and to compare the obtained results with the standardized evaluation data, on the basis of which to establish the presence or absence of giftedness on the contingent of research. Secondary goal to determine whether there are correlations between the anthropometric parameters of the subjects and the results of the agility test (IAT). To perform our goals we surveyed young football players from five leading academies, as follow: A.O. Kavalas; Π.A.O.K. Kavala; Apollon Kavalas; A.E.K. Kavalas and Kavala 2004. The study groups have a antropometrichal parameters as follow: age – 16,73±1,04, height – 173,3±0,06 cm, weight - 65,48±9,70, and BMI of 21,9±1,06 (M±SD). The Illinois Agility Test (Getchell, 1979) is a commonly used test of agility in sports, and as such there are well established norms available. Purpose of the test: to measure running agility using various turns and movements. Equipment required: flat non-slip surface, marking cones, stopwatch, measuring tape, timing gates (optional). Procedure: we explain the test procedures to the subject. We explained screening of health risks and obtain informed consent. We prepared forms and record basic information such as age, height, body weight, gender and test conditions. The test area was measured and mark out using cones. Check the timing gate equipment and calibrate if required.

Picture 01. The description of the Illinois Agility Test



The description of the Illinois test for agility, as fallow: course layout: the length of the course is 10 meters and the width is 5 meters. Four cones are used to mark the start, finish and the two turning points. Another four cones are placed down the center an equal distance apart. Each cone in the center is spaced 3.3 meters apart (*Picture 01*). For advantages of IAT we can say: that this is a simple test to administer, requiring minimal equipment. Also, the player's ability to turn in different directions

and at different angles are tested. To avoid differences we test was performed with the same football boots, at the same time of day and under the same weather conditions. For accurately measure the result we used a Casio stopwatch HS-80TW-1EF.

Statistical methods. We used GraphPad Prism version 3.0, for statistical analysis. The parameters are presented as mean values and standard deviation (M ± SD). The correlations between antropometric parameters and motor test results, were calculated by Pearson's coefficient ($p < 0.05$). Kruskal Wallis test, One Way ANOVA.

3. RESULTS

The results of the anthropometric assessment show that the studied groups have average values for height 173,3±0,06 cm, for age 16,73±1,04 y, for weight 65,48±9,70 kg (M±SD) (*Table 06*). Body mass index has average values of 21,9±1,06.

Table 01. Anthropometric parameters

KAVALA 2004				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	17,30	1,75	69,13	22,6
SD	0,82	0,05	7,99	

Table 02. Anthropometric parameters

APOLLON KAVALAS				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	16,00	1,69	58,41	20,7
SD	0,0	0,05	7,73	

Only the measured weight of the participants have values with a large standard deviation, as follows: Kavala 2004 69,13±7,99 kg; Apollon Kavalas 69,13±7,99 kg; P.A.O.K. Kavalas 67,78±12,36 kg; A.E.K. Kavalas 61,58±8,07 kg; A.O. Kavalas 71,35±7,52 kg. (*Tables 1-5*)

Table 03. Anthropometric parameters

P.A.O.K. KAVALAS				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	17,75	1,74	67,78	22,3
SD	1,48	0,06	12,36	

Table 04. Anthropometric parameters

A.E.K. KAVALAS				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	16,23	1,72	61,58	20,8
SD	0,44	0,04	8,07	

The highest measured players are from A.O. Kavalas with data 1,77±0,07 m, with Body mass index 23,0 кg/м^2.

Table 05. Anthropometric parameters

A.O. KAVALAS				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	17,00	1,77	71,35	23,0
SD	1,09	0,07	7,52	

Table 06. Anthropometric parameters

ALL research				
	Age (y)	**Height (m)**	**Weight (kg)**	**BMI (кg/м^2)**
MEAN	16,73	1,73	65,48	21,9
SD	1,04	0,06	9,71	1,06

Table 08 shows that the mean values of all groups studied are almost the same, because the standard deviation is almost insignificant, in terms of statistical significance (17,78±0,1184). Those who manifested agility must be sought as individual score in the whole.

Table 07. Rating Scores (Davis et al., 2000).

Rating	**Males (seconds)**	**Females (seconds)**
Excellent	< 15.2	< 17.0
Above Average	15.2 - 16.1	17.0 - 17.9
Average	16.2 - 18.1	18.0 - 21.7
Below Average	18.2 - 19.3	21.8 - 23.0
Poor	> 19.3	> 23.0

Table 08. Mean values and standard deviation of the result from the studied contingent

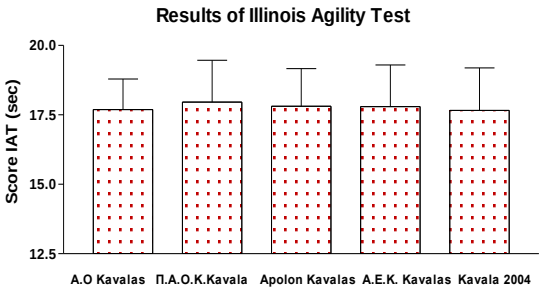
Team	**Score of Illinois Agility Test(sec)**
A.O. KAVALAS	**17,69±1,098**
P.A.O.K. KAVALAS	**17,96±1,503**
APOLLON KAVALAS	**17,81±1,353**
A.E.K. KAVALAS	**17,80 ±1,499**
KAVALA 2004	**17,66 ±1,528**
Mean end Standard Deviations (M ± SD)	**17,78±0,1184**

The results of the agility test from all five teams were similar and did not differ statistically significantly ($P > 0.05$, Kruskal Wallis test, One Way ANOVA). They

are in the range of 17.66 ± 1.528 and 17.81 ± 1.353. (*Graphic 01).* Compared to Davis' Single Score, the average score is rated as Average. (*Table 07*.)

According to the results the team with the highest score mean was Π.Α.Ο.Κ. Kavalas. From the 60 boys 4 made an excellent score, 6 above average, 23 average, 23 below average and 4 poor (*Graphic 02*). In other word 6,7% of the sample scored an excellent performance. The results presented as a percentage show that only 4 (6.7%) young players have achieved an Excellent result in the range of less than 15.2 seconds, 6 of them (10%) have a result Above average (15.2 - 16.1 sec), Medium (16.2 - 18.1 sec) and below average (18.2 - 19.3 sec) have 23 participants (38.3%), and the rest have a poor result of 4 (6.7 19.3 <and more sec), (*Table 09).*

Graphic 01. Results of agility test score of the five teams



Graphic 02. Results of agility test score of five teams

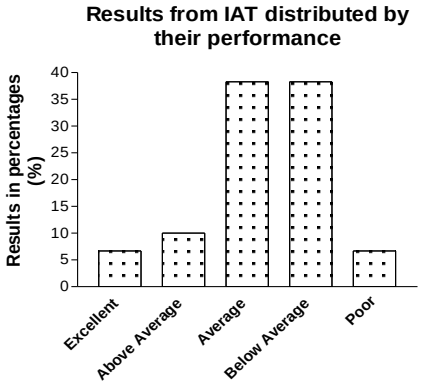


Table 09. Total rating and percentages of the scoring of the sample

Rating scale	Number of all	Percent
Excellent	4	6,7%
Above Average	6	10%
Average	23	38,3%
Below Average	23	38,3%
Poor	4	6,7%

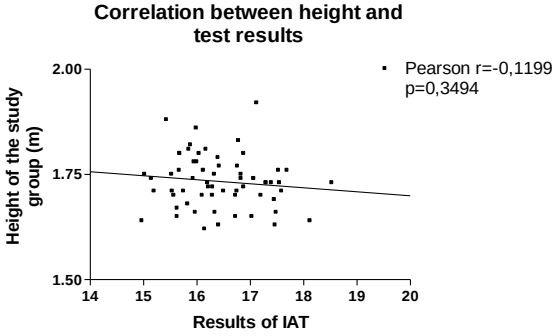
Correlations between the anthropometric parameters and agility score.

We checked all possible relationships between age, height, weight and score of Illinois agility test. We used a Pearson's coefficient with a confidence integral of ($p < 0.05$). In general, we can say that no significant correlations were found. As with only one of the variables (height) a negative correlation was found which is about r= 0,1199, p= 0,3494. It can be seen in Figure 00. However, it is insignificant and has no reliable significance.

As we know, they become significant at a Pearson coefficient above ± 0,3. For the other two variables, the results are similar and the Pearson ratio is respectively

r =0,0172, p =0,894 between score IAT and weight and for score and age is r =-0,04138, p =0,7474.

Graphic 03. Correlation between anthropometric parameters and agility score



4. DISCUSSIONS

The ability to move at high speeds and quickly execute changes of direction (CODs) is a prerequisite for successful participation in many team sports, including soccer (Luhtanen, 1994). Although these actions could make the difference in determining the outcome of a game, they only represent 11% of the total distance covered during a typical game (Reilly et al., 2000). During a soccer match, a COD occurs every 2 to 4 seconds (Davids, Lees, & Burwitz, 2000), and soccer players change direction between 1,200 and 1,400 times over the course of a game

(Bangsbo, 1992). Therefore, agility tests are must to by used to assess and analyze the relationship between anthropometric performance and motor control (Kubayi, Paul, Mahlangu, & Toriola, 2017). The average time on the test we use was 17.78 ± 0.1184 sec, the participants had to perform 9 CODs, which means that each one was performed on average in about 2 seconds. In particular, COD performance is important for soccer players as numerous situations within the game require a sudden COD in response to a stimulus, such as an action of a teammate, an opponent or the ball (Sheppard & Young, 2006). Lloyd and Olivier (2012) highlighted the need for a structured approach to COD development throughout childhood and adolescence. In this context Mirkov, Kukolj, Ugarkovic, Koprivica, and Jaric (2010) emphasized that performing a COD could be a crucial factor in determining the future success of 11-12 year-old players.

Several studies have suggested that COD performance gradually increases as children mature, albeit in a nonlinear manner (Vänttinen, Blomqvist, Nyman, & Häkkinen, 2011). This trend has been reinforced by recent studies indicating that agility is significantly lower at the age of 12 than it is at 14 (Jakovljevic, Karalejic, Pajic, Macura, & Erculj, 2012). It has also been argued that the peak rate of development of COD performance occurs at approximately 13 to 14 years of age in male soccer players, which is commonly considered to be the period at which the rate of height increase peaks (Vänttinen et al, 2011). A model recently proposed by Lloyd et al (2013) suggests that the percentage of training time dedicated to COD development in prepubertal, circumpubertal, and postpubertal children should be 25, 40 and 20%, respectively, indicating that COD training is a function of the player's maturational stage. The average age of the players we studied was 16.73 ± 1.04 y, which suggests that they are in a sensitive period of agility development. But when analyzing the data from the measured test and the standard Davis table, it is clear that only 4 boys or 6% of the whole group have an excellent result. Here we must pay attention to these 40% of the total training, it should be aimed at improving the motor control and agility of football players. Graphic 02 presents data in percentage analysis.

According to Malina, Eisenmann, Cumming, Ribeiro, and Aroso (2004), boys with advanced sexual and skeletal maturity are stronger, faster and more powerful than boys who undergo late maturation. This phenomenon could result in a spurious relationship between COD performance and body size (Gaurav, Singh, & Singh, 2015). Although movement velocity and COD should not be related to body size (Sheppard and Young, 2006), there is some evidence that a difference in the onset of maturation could confound that relationship (Nedeljkovic, Mirkov, Kukolj, Ugarkovic, & Jaric, 2007). In our study, we did not find a statistically significant correlation according to Pearson, between the anthropometric parameters age, weight and height with the average IAT test result. Similar data were obtained by researchers Gjonbalaj, Bjelica, and Georgiev (2017), who studied the agility of IAT in 88 football players aged 19 years and did not find a statistically significant correlation ($p = 0.128$) between agility and a system of anthropometric measures. Moreover, the correlation with height is negative $r = - 0.1199$, $p = 0.3494$. This indicates that as the height decreases, the test result becomes weaker. Or taller players have a better score. This may be due to the athlete's longer stride, but we can only guess. However, we assumed that the BMI would correlate with the agility test result, but even this did not prove reliably Pearson ($p < 0.05$). Despite the good result of measuring BMI 21.9 ± 1.06 kg/m^2 in our study, it has no evidence of an effect on motor agility quality.

However, both muscle strength and power have been positively correlated with body size (Jaric, 2003). In our previous study (Kanelov, Goceva, & Nikolov, 2019), we searched for correlations between somatotype profile, anthropometric profile and motor skills, respectively, but only proven relationships were found with the between BMI (kg/m^2) and result of 50 meters (sec) $r = 0.832$, $p < 0.0001$ (Pearson). Therefore, it remains unknown whether COD measurements obtained from young athletes should be normalized for body size. The data for the weight of our contingent have values of 65.48 ± 9.71. We assume that these differences are due to the different playing positions that players have in the football game, respectively goalkeepers, defenders, midfielders, forwards and strikers. Similarly, agility is negatively correlated with all measured anthropometric variables in all playing positions and no statistically significant difference was observed Aychiluhim and Deyou (2020).

New trends are championing other methods of evaluation for physical education teachers such as measuring the tactical ant technical side of the students, rather than just the physical side (González-Víllora, Serra-Olivares, Pastor-Vicedo, & Da Costa, 2015), and evaluating the decision-making of young players in both sports and educational contexts. For example, in Bulgaria from 2018 a similar agility test is included in the System for control and evaluation of the achievements of students in physical education and sports used in the second stage of the basic educational degree.

5. CONCLUSIONS

"Agility" is an important component of the general motor abilities of man, in particular we can distinguish it as motor coordination and motor control of man. The Illinois Agility Test (Getchell, 1979) allows us to interpret real results of human mobility. The test is field-based and easy to organize and perform. This gave us the idea to study

young players of the Football Academies from the area of Kavala. The analysis of the results of our study shows that a small group of football players (6%) performed the task of the test as "Excellent". We know that individual agility, as a motor quality, is the basis of the success of the player and the whole team. We found that anthropometric parameters (height and weight) and good body shape (BMI) have no significance correlation (Pearson , $p < 0.05$) with the performance of agility. We advise scout coaches to use IAT to select and recognize gifted and talented children in the field of football. Therefore, as a recommendation, we suggest that coaching teams pay more attention to the quality of muscles and motor control of players in future sports training.

ACKNOWLEDGEMENTS
The authors would like to thank the young players and their sports managers for their enthusiastic participation despite the pandemic conditions around the world.

REFERENCE

Aychiluhim, W., & Deyou, M. (2020). Association Of Anthropometric Profile To Speed And Agility Performance In Male Soccer Players . Turkish Journal of Sport and Exercise , 22 (1) , 78-86 . Retrieved from https://dergipark.org.tr/en/pub/tsed/issue/53281/621456

Bangsbo, J. (1992). Time and motion characteristics of competition soccer. *Science Football*, 329 1992; 6: 34-40.

Davids, K., Lees, A., & Burwitz, L. (2000). Understanding and measuring coordination and control in kicking skills in soccer. Implications for talent identification and skill acquisition. *J Sports Sci*, 18: 703–714.

Davis, R., Phillips, R., Roscoe, J., Roscoe, D., & Davis, B. (2000). Physical Education and the Study of 4th Edition, Sport. Mosby Ltd.

Gaurav, V., Singh, A.B., & Singh, S. (2015). Comparison of selected physical fitness components among male football players of different playing positions. Turkish journal of sport and exercise, 17, 22-25.

Getchell, B. (1979). Physical Fitness: A Way of Life, 2nd ed. New York: John Wiley and Sons, Inc., 1979.

Gjonbalaj, M., Bjelica, D., & Georgiev, G. (2017). Relations Between Anthropometric Characteristics and Motor Test - Illinois Agility Run Test. Acta Kinesiologica, 11(1), 34–36.

González-Víllora, S., Serra-Olivares, J., Pastor-Vicedo, J.C., & Da Costa, I.T. (2015). Review of the tactical evaluation tools for youth players, assessing the tactics in team sports: Football. *Springerplus*, 4, 663.

Jaric, S. (2003) Role of body size in the relation between muscle strength and movement performance. Exerc Sport Sci Rev,; 31: 8-12 370

Jakovljevic, S.T., Karalejic, M.S., Pajic, Z.B., Macura, M.M., & Erculj, F.F. (2012). Speed and agility of 12- and 14-year-old elite male basketball players. J Strength Cond Res, 26: 2453-2459.

Kanelov, I., Goceva, L., & Nikolov, B. (2019). INFLUENCE OF ANTHROPOMETRIC INDICES ON THE PHYSICAL PERFORMANCE ON 12-14 YEAR OLDS. Knowledge International Journal, 34(2), 563 - 569. Retrieved from https://ikm.mk/ojs/index.php/KIJ/article/view/2154.

Kioumourtzoglou, E., Michalopoulou, M., Tzetzis, G., & Kourtessis, T. (1998). Cognitive abilities supporting expertise in team sports. Coaching and Sport Science Journal, 3, 30-36.

Kubayi, A., Paul, Y., Mahlangu, P., & Toriola, A. (2017). Physical Performance and Anthropometric Characteristics of Male South African University Soccer Players, Journal of Human Kinetics, 60(1), 153-158. doi: https://doi.org/10.1515/hukin-2017-0098

Lloyd, R.S., & Oliver, J.L. (2012).The youth physical development model: A new approach to long-term athletic development. Strength Cond J. ;34:61–72

Lloyd, R.S, Read, P., Oliver, J.L. Meyers, W.M, Nimphius, S., & Jeffreys, I. (2013). Considerations for the Development of Agility during Childhood and Adolescence. Strength Cond J.;35(3):2–11.

Luhtanen, P. (1994). Biomechanical aspects. In: Football (Soccer) Handbook of Sports Medicine 385 and Science, ed. B. Ekblom. Blackwell Scientific Publications, London.

Malina, R.M., Eisenmann, J.C., Cumming, S.P., Ribeiro, B., & Aroso, J. (2004). Maturity-associated 387 variation in the growth and functional capacities of youth football (soccer) players 13-388 15 years. *Eur J Appl Physiol*, 91(5-6): 555-62.

Mirkov, D.M., Kukolj, M., Ugarkovic, D., Koprivica, V.J., & Jaric, S. (2010). Development of anthropometric and physical performance profiles of young elite male soccer players: a 398 longitudinal study. *J Strength Cond Res*, 2677-82.

Nedeljkovic, A., Mirkov, D.M., Kukolj, M., Ugarkovic, D., & Jaric, S. (2007). Effects of maturation on the relationship between physical performance and body size. *J Strength Cond Res*, 21: 245-50.

Vänttinen, T., Blomqvist, M., Nyman, K., & Häkkinen, K. (2011). Changes in body composition, Hormonal Status, and physical fitness in 11-, 13-, and 15-year-old Finnish regional 413 youth soccer Players during a two-year follow up. *J Strength Cond Res*, 25: 3342- 3351.

Reilly, T., Bangsbo, J., & Franks, A. (2000). Anthropometric and physiological predispositions for elite soccer. Journal of Sports Sciences, 18, 9, 669–683.

Sheppard, J.M., & Young, W.B. (2006). Agility literature review: Classifications, training and 407 testing. J Sports Sci, 24: 919-932.