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## Investigation of agility performance on 10-12 years soccer players

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### Abstract

This research was carried out for investigation of 10-12 age soccer players' agility performance according to age. 53 male soccer players attended in this research voluntarily. Illinois agility test was used in the assessment of agility performance. Collected data was recorded in SPSS program. One Way Variance Analyze (ANOVA) was used for determination of differences in different group soccer players. When difference was discerned among groups, Tukey HSD analyses were used for detecting which groups cause this difference. Significance level was accepted as  $p < 0.05$ . According to research results, significant differences were determined among 10, 11 and 12 age group soccer players' agility performances ( $p < 0.01$ ). The sources of differences were those, 12 age group soccer players according to 10 and 11 age group showed better performances. Consequently, It can be said that agility feature consisting suddenly stop, change direction and acceleration actions are effected by age in these groups.

**Keywords:** Age; Agility; Child; Soccer.

### Introduction

Soccer is one of the most beloved and popular sports branches both in the World and Turkey. Key to success in soccer depends first of all on finding appropriate players and enhancing these player's performances. Movements related to anaerobic energy such as short-range sprints, abrupt halts, abrupt deflections which are short dated and high volume often come into being in soccer (Gunay and Yuce, 2008).

Agility, as a reaction to stimulus from environment, it is defined as a movement consisting abrupt and fast deflection. For example agility can be identified as an unplanned movement such as abrupt speed-up or slow-down in order to get rid of rival player's movements whom we met on a

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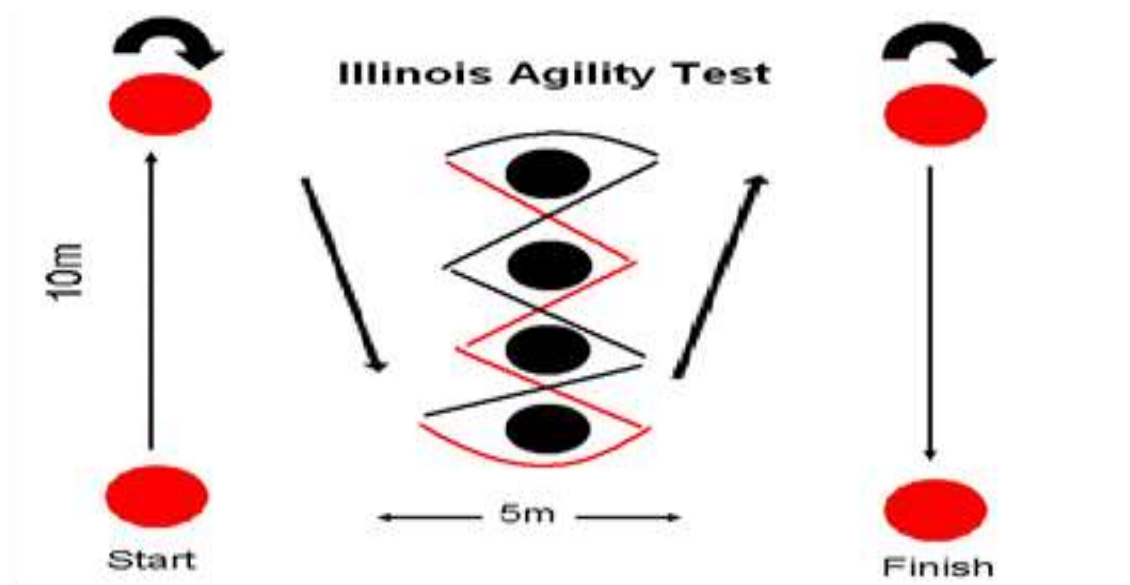
straight line (Sheppard and Young, 2006). According to identification, agility is ability of changing body direction effectively and productively (Verschuren, Bloemen, Kruitwagen and Takken, 2010).

Measurement of agility performance is important in terms with sportsmen's development planning. In order to determine agility performance, several of field tests which can easily be performed by trainers and players are developed. Common characteristic of these tests are their applicability in field and their measurability with simple measuring sets. Illinois Agility Test, Agility Test, 505 Agility Test, Pro-Agility Test are some of tests which are used in sports commonly (Karacabey, 2013; Young and Farrow, 2006; Sheppard and Young, 2006). Intended level development of agility will be a powerful base for the control of motor skills and neuromotor system. It is known that abrupt deflections are the main reasons of mutilation. As a result of improving agility in desired level individual movement mechanics also develop and mutilation risk lessens. Arising of fast deflection ability will be helpful both for attack and defense. Generally it will be helpful for arising performance (Little and Williams, 2005). In the light of this data, this study was carried out for investigation of 10-12 age soccer players' agility performances according to age.

## Materials and Methods

Fifty-three (average age:  $11.09 \pm 0.81$ ) soccer player (10 age ( $n=15$ ), 11 age ( $n=18$ ), 12 age ( $n=20$ )) attended in this study voluntarily. Illinois agility test was used to determine the agility characteristics of players. Measurements were carried out in competition periods, resting days and after warm up sessions. Body-weight was measured by 0.1 susceptible electronic scales. Height was measured by 0.01 cm susceptible digital measure. "*Body-Mass Index (BMI) = Body Weight/Height (m)<sup>2</sup>*" formula was used in the calculation of body-mass index (Tamer, 2000; Zorba and Saygin, 2009).

**Illinois Agility Test:** Test racetrack made up of width 5 m, height 10 m and middle 3, 3 m spaced level line three cones is set in sports hall. Test consists of 180° rotations every 10 m. Of these 40 m is flat; 20 m is slalom running among cones. When racetrack was set, double door photocell electronic chronometer were placed at start and finish points. Players checked out from start point of racetrack facedown and hands on shoulder length and in contact with place. And completion duration was recorded in terms of seconds. Test was repeated two times and best score was evaluated. (Amiri-Khorasani, Sahebozamani, Tabrizi and Yusof, 2010; Karacabey, 2013; Hazir, Mahir and Acikada, 2010).



### Statistical Analysis:

Collected data was recorded in SPSS program. One Way Variance Analyze (ANOVA) was used for determination of differences in different group soccer players. When difference was discerned among groups, Tukey HSD analyses were used for detecting which groups cause this difference. Significance level was accepted as  $p < 0.05$ .

### Results

**Table 1:** Illinois agility test, body mass index, height and weight values of 10-12 age soccer players

Variables	Age	Mean $\pm$ SD	F	P
Height (cm)	10	149.60 $\pm$ 2.16	25.167	0.000**
	11	152.67 $\pm$ 1.81		
	12	154.30 $\pm$ 1.89		
Weight (kg)	10	40.27 $\pm$ 1.28	59.226	0.000**
	11	42.44 $\pm$ 1.54		
	12	46.80 $\pm$ 2.33		
Body Mass Index (kg/m <sup>2</sup> )	10	18.01 $\pm$ 0.84	17.337	0.000**
	11	18.22 $\pm$ 0.88		
	12	19.66 $\pm$ 1.02		
Illinois Agility Test (sec)	10	22.80 $\pm$ 0.71	30.656	0.000**
	11	22.54 $\pm$ 0.75		
	12	20.85 $\pm$ 0.94		

\*\* $p < 0.01$

According to the findings of this study, significant differences were found in height, weight, body mass index and agility performance values among 10,11 and 12 age group soccer player ( $p < 0.01$ )

**Table 2:** The results of Tukey HSD for 10-12 age soccer players

Variables	Age (I)	Age (J)	Difference (I-J)
Height (cm)	10	11	-3.066*
		12	-4.700*
	11	10	3.066*
		12	-1.633*
	12	10	4.700*
		11	1.633*
Weight (kg)	10	11	-2.177*
		12	-6.533*
	11	10	2.177*
		12	-4.355*
	12	10	6.533*
		11	4.355*
Body Mass Index (kg/m <sup>2</sup> )	10	11	-0.217
		12	-1.656*
	11	10	0.217
		12	-1.438*
	12	10	1.656*
		11	1.438*
Illinois Agility Test (sec)	10	11	0.261
		12	1.945*
	11	10	-0.261
		12	1.683*
	12	10	-1.945*
		11	-1.683*

\*p&lt;0.05

## Discussion and Conclusion

Agility is identified as body's fast turnaround ability composing as a result of combination of agility, power, speed balance and coordination characteristics (Bidaurrazaga-Letona et al., 2015). According to Homoud (2015), agility is significant component of activities requiring high speed (acceleration, maximal speed) especially of field and team sports and it is one of the main technical factors for sportive success in soccer (Alanazi and Aouadi, 2015; Homoud, 2015).

In this study, agility performance was investigated according to age in 10-12 age soccer players. Looking at the results of this study, significant differences were found in height, weight, body mass index and Illinois agility test performance among 10,11 and 12 age group soccer player ( $p<0.01$ ). While the height of soccer players aged 10, 11, 12 years were found  $149.60 \pm 2.16$  cm,  $152.67 \pm 1.81$  cm and  $154.30 \pm 1.89$  cm, respectively, the weight of soccer players aged 10,11,12 years were found  $40.27 \pm 1.28$  kg,  $42.44 \pm 1.54$  kg and  $46.80 \pm 2.33$  kg, respectively. Body mass index of players were found to be  $18.01 \pm 0.84$  kg/m<sup>2</sup>,  $18.22 \pm 0.88$  kg/m<sup>2</sup> and  $19.66 \pm 1.02$  kg/m<sup>2</sup> aged 10, 11, 12 years old, respectively. Illinois Agility Test values of players were found to be  $22.80 \pm 0.71$  sec.,  $22.54 \pm 0.75$  sec., and  $20.85 \pm 0.94$  sec., respectively. Reason of this difference was that 12 age group soccer players performed better than 11 and 10 age group.

Bidaurrazaga-Letona et al., (2015) determined that 13 age and average age  $12.0 \pm 0.8$  year soccer players showed better agility performances than average age  $10.4 \pm 0.3$  year and 11 aged soccer players. And it was also seen that both age group agility performance's optimization rates are close to eachothers. In literature, studies investigating agility time according to age and saying that the older was the age the better was the agility performance and age was an significant factor in determining the agility performance are available (Bidaurrazaga-Letona et al., 2015; Dellal and Wong, 2013; Zemkova and Hamar, 2014; Cetin, 2013).

The study was conducted was by Zemkova and Hamar (2014) examined agility performances on 553 children and adolescents in 7-18 ages. 27.1% optimization was seen in 7-10 age agility times. 26.5% optimization was seen 10-14 age agility times. Among 14-18 ages namely puberty period (16.5%) little optimization was seen in agility times. Consequently it was reported that the older was the age the more optimization was in agility timing until precocious puberty. Cetin (2013) investigated if there was a difference in agility performances according to age in 7-12 age children. 83 male attended in this study. Males 7-8 age; 9-10 age and 11-12 age were divided into three groups. Illionis agility test was used to determine the agility performances. In conclusion, it was seen that agility performance rises together with age. In males agility performance values were in turn  $24.5 \pm 2.5$ ,  $22.6 \pm 1.6$ ,  $21.3 \pm 1.9$  sec. 11-12 age group males showed 5.7% better agility performance than 9-10 age group males. Also they showed 13.1% better agility performances than 7-8 age group performances. 9-10 age group males showed 7.7% better agility performance than 7-8 age groups. Kizilet, Atilan and Erdemir (2010) found that average age  $13.00 \pm 0.95$  years, training ages  $3 \pm 1$  years and 12 basketball player's Illionis agility test performances were  $20.13 \pm 1.39$  seconds with balls and without balls they were  $18.65 \pm 1.03$  seconds.

Rowland (2005) emphasizes that characteristic such as motor skill, strength, sprint and speed which were ongoing process of development continued throughout childhood. The study was managed by Pettersen and Mathisen (2012) on 11-12 year old boys studied the development of agility, acceleration and speed performance. According to results of the study, improvement of the acceleration, speed and agility performance of this age group were 2.1%, 1.8%, 3.5%, respectively. The biggest improvement was found in agility performance as 3.5%.

As regards to research results, significant differences were determined among 10-12 age group soccer players' Illinois agility test values. The sources of differences were those 12 age group soccer players according to 10 and 11 age group showed better performances. Consequently, it can be said that agility property which consist suddenly acceleration, change direction and stop actions are affected by age positively in these age groups. In order to improve

the agility characteristic in children, age factor can be considered in the preparation of training programs.

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