



## THE EFFECTS OF A 6-MONTHS PROPRIOCEPTION TRAINING PROGRAM ON AGILITY IN YOUNG FOOTBALL PLAYERS

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### **Abstract:**

The purpose of this study was to determine if proprioceptive training can be effective to improve male football players' agility (Christou et al, 2006). Sixty-two students ( $17 \pm 0.3$  yrs) of the "Drita" high school (Kichevo, Republic of Macedonia) were recruited for this study and divided in two sub-groups [control (CG) and experimental (EXG)] to be involved in a pre- and post- training measurement design. All participants were football players and were attending a period of six months of football training planned with three 45-minute weekly sessions. In particular the CG (N=31) followed a standard (physical, technical and tactical) football program, while the EXG (N=31) was also exposed to specific proprioceptive drills. The effects of a proprioceptive program, if any, were assessed by means of two specific agility tests: 505 Agility Test (505AT) and Illinois Agility Test (IAT) without the ball. The analysis of pre and post 505 AT and IAT performances were carried out by means of ANOVA with repeated measures. The result of the initial state at the 505 AT test in the controlled group is 2.9110, whereas the final result has the value of 2.6926. On the other hand, in the experimental group, the value of the initial state of the same test is 2.8955 sec and after the 6-months training program, the result is improved and is worth 2.5658 sec. The results revealed a significant difference between pre and post measures in 505 AT ( $p < 0.05$ ). The result of the initial state at the IAT test in the control group is 17.5032 sec whereas the final result has the value 16.0381sec. On the other hand, in the experimental group, the value of the initial state of the same test is 18.1761 sec and after the 6-months training program, the result is improved and is worth 16.3803 sec. The results revealed a significant difference between pre and post measures in IAT ( $p < 0.05$ ). The two football players sub-groups involved in this study undertook two specific agility tests (505 AT and Illinois Agility Test without the ball). The results showed a positive effect of specific proprioceptive training to improve the young football players' agility abilities. Regarding the AT 505 test, the experimental group compared to the control group, at the initial state as well as the final condition, had better results. The improvement of results after the completion of the 6-months program is evident in the experimental group. But at the IAT test in both states the control group has somewhat better results compared to the experimental

group. Yet the improvement of the result is evident at the experimental group after the application of the 6 months proprioceptive training program, compared to the control group.

**Keywords:** proprioception training, agility, young football players

## 1. Introduction

The purpose of this study was to determine if proprioceptive training can be effective for improving male football players' agility (Christou et al, 2006, Gabbett, T. et al. 2008, Sheppard & Young 2006). The 05 Agility Test (Draper 1985, Mackenzie 2005) is generally used to monitor the development of the athlete's speed and agility. (Mackenzie 2005) notes that with appropriate training between each test, the analysis would indicate an improvement in the athlete's agility and speed. The Illinois Agility Run Test (Getchell 1979, Mackenzie 2000) is generally used to monitor the development of the athlete's [agility](#).

## 2. Methods

### 2.1 Participants

Sixty-two students ( $17 \pm 0.3$  yrs) of the "Drita" high school (Kichevo, Republic of Macedonia) were recruited for this study and divided in two sub-groups [control (CG) and experimental (EXG)] to be involved in a pre- and post- training measurement design.

### 2.2 Procedures

All participants were football players and were attending a period of six months of football training planned with three 45-minute weekly sessions. In particular the CG (N=31) followed a standard (physical, technical and tactical) football program, while the EXG (N=31) was also exposed to specific proprioceptive drills. The effects of a proprioceptive program, if any, were assessed by means of two specific agility tests: 505 Agility Test (505AT) and Illinois Agility Test (IAT) without the ball.

### 2.3 Statistical Analyses

Statistical Analyses was conducted using IBM SPSS Statistics 22. Pre and post scores for the dependent variables were analyzed using descriptives and inferential methods. The analysis of pre and post 505 AT and IAT performances were carried out by comparing means of experimental and control groups. ANOVA analysis with 2 repeated measurements was used to identify and statistically evaluate a possible change as a training effect.

### 3. Results

Descriptive statistics results (see table 1) provide a simple summary about the sample and the pre and post measures. The result of the initial state at the 505 AT test in the controlled group is 2.9110, whereas the final result has the value of 2.6926. On the other hand, in the experimental group, the value of the initial state of the same test is 2.8955 sec and after the 6-months training program, the result is improved and is worth 2.5658 sec.

**Table 1:** Descriptive Statistics Results

**Case Summaries**

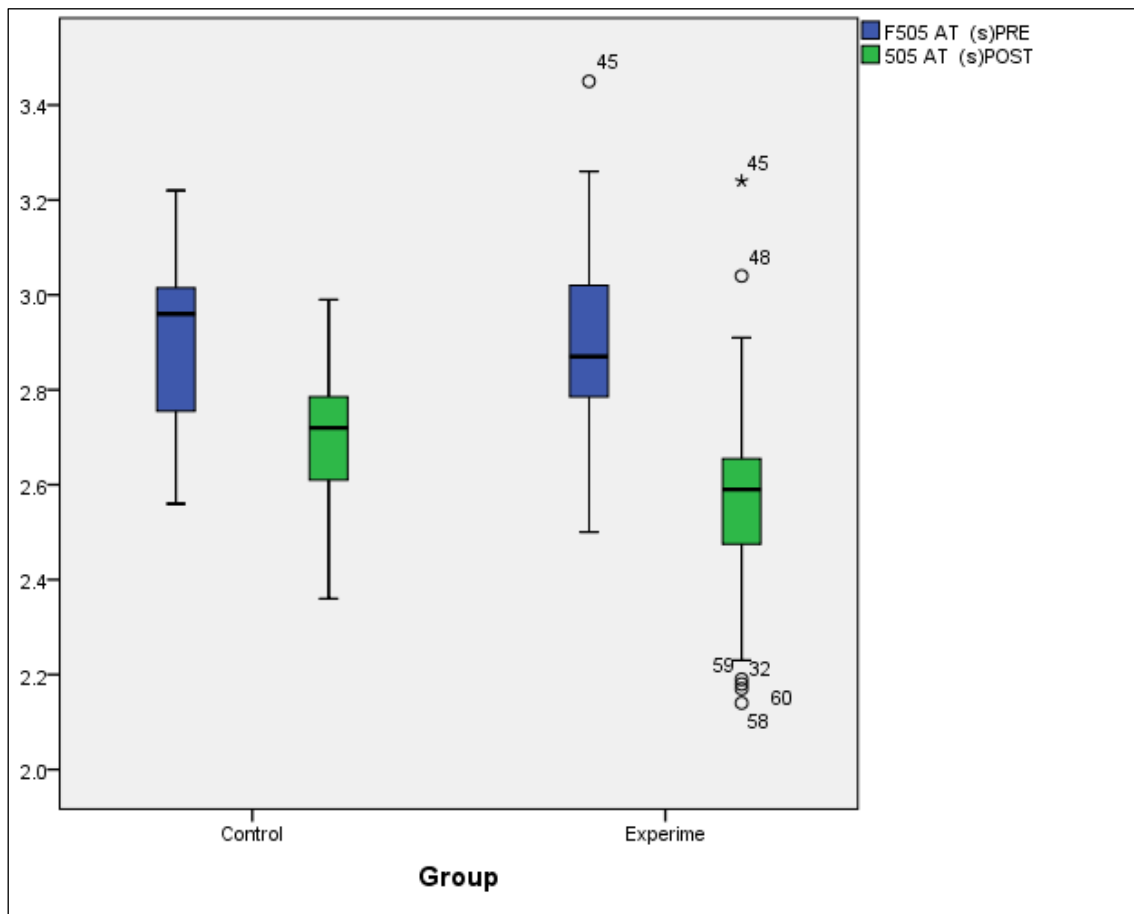
Group		F505 AT (s)PRE	505 AT (s)POST	IART (s)PRE	IART (s)POST
<b>Control</b>	N	31	31	31	31
	Mean	2.9110	2.6926	17.5032	16.0381
	Median	2.9600	2.7200	17.2900	15.8800
	Std. Deviation	.16026	.15792	1.41955	1.13825
	Std. Error of Mean	.02878	.02836	.25496	.20443
<b>Experimental</b>	N	31	31	31	31
	Mean	2.8955	2.5658	18.1761	16.3803
	Median	2.8700	2.5900	18.1000	16.1300
	Std. Deviation	.21017	.24732	1.50604	1.42212
	Std. Error of Mean	.03775	.04442	.27049	.25542
<b>Total</b>	N	62	62	62	62
	Mean	2.9032	2.6292	17.8397	16.2092
	Median	2.9200	2.6300	17.6950	16.0850
	Std. Deviation	.18551	.21548	1.49050	1.28902
	Std. Error of Mean	.02356	.02737	.18929	.16371

Repeated Measure for ANOVA Illinois 505 test are presented in the following table.

**Table 2:** Repeated Measure for ANOVA Illinois 505 test

Source	factor1	Type III Sum of Squares	df	Mean Square	F	Sig.
<b>factor1</b>	Linear	2.328	1	2.328	201.040	.000
<b>factor1 * Group</b>	Linear	.096	1	.096	8.290	.006
<b>Error(factor1)</b>	Linear	.695	60	.012		

Boxplot for 505 AT pre and post scores (Figure 1) was used to give information regarding the shape, variability, and center of the two data sets.



**Figure 1:** Boxplot 505 AT pre & post scores

Repeated Measure ANOVA for IART is presented in the following table:

**Table 3:** Repeated Measure for ANOVA IART

Source	factor1	Type III Sum of Squares	df	Mean Square	F	Sig.
factor1	Linear	82.413	1	82.413	253.294	.000
factor1 * Group	Linear	.847	1	.847	2.604	.012
Error(factor1)	Linear	19.522	60	.325		

Boxplot for IART pre and post scores (Figure 2) was used to give information regarding the shape, variability, and center of the two data sets.

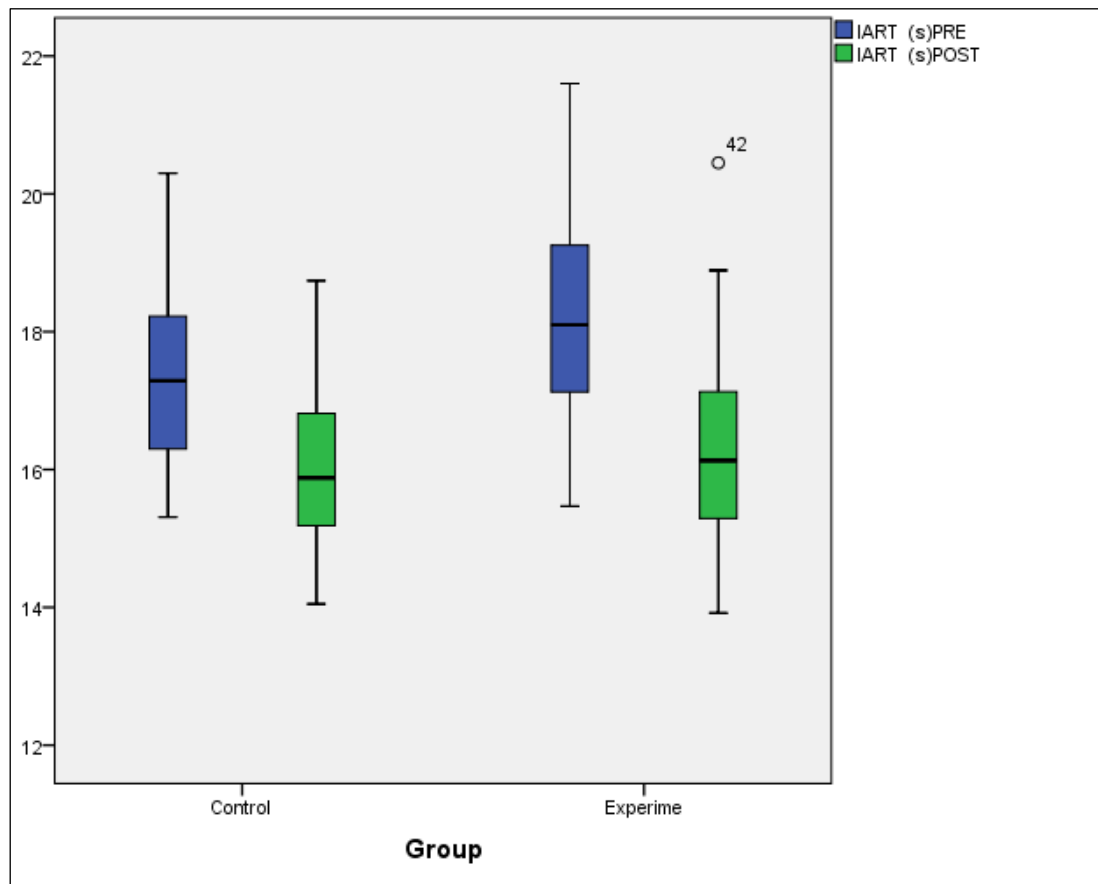


Figure 2: Boxplot for IART pre & post scores

The results revealed a significant difference between pre and post measures in 505 AT ( $p < 0.05$ ). The result of the initial state at the IAT test in the control group is 17.5032 sec whereas the final result has the value 16.0381 sec. On the other hand, in the experimental group, the value of the initial state of the same test is 18.1761 sec and after the 6-months training program, the result is improved and is worth 16.3803 sec.

#### 4. Conclusions

The two groups undertook two tests of Agility: 505 Agility Test and Illinois Agility Run Test Ball. Results revealed that proprioception training was effective by improving football players overall agility. Pre and post measurements were analyzed to evaluate performance improvements. ANOVA with repeated measures results in order to reveal a possible significant group effect for 505 Agility Test and for Illinois Agility test. The results revealed a significant difference between pre and post measures in IAT ( $p < 0.05$ ). The two football players sub-groups involved in this study undertook two specific agility tests (505 AT and Illinois Agility Test without the ball). The results showed a positive effect of specific proprioceptive training to improve the young football players' agility abilities. Regarding the AT 505 test, the experimental group compared to the control group, at the initial state as well as the final condition, had better results. The improvement of results after the completion of the 6-months program is evident in the

experimental group. But at the IAT test in both states the control group has somewhat better results compared to the experimental group. Yet the improvement of the result is evident at the experimental group after the application of the 6 months proprioceptive training program, compared to the control group.

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