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Physical, Technical and Psychological effects of SocialSoccer® on young soccer players, involved in the "CROSS" European Erasmus+ project

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Introduction

Background

Athletic games, including soccer, are a part of the so- called “situational” sports. “The execution of techniques on the competitive conditions, especially the technical and tactical ones, and the conditions of the opponent and the opponent team”.
Soccer at every level of qualification, from children to adults, besides being defined as a situational game environment, is also characterized by its invasive model of technical and tactical actions, meaning that both teams are completely free to move within any part of the field and may also evidently come into physical contact. Soccer is also considered a sport with a high level of technical and coordination skills, in which the foot is reserved a lot more activities than usual. Feet are generally used for support and movement, having a different biological sensorial evolution compared to hands, which normally have primary interactive functions with the environment. In general terms, the soccer player's performance is made up of the following components:

- Genetic and morphological/functional;
- Perceptive and sensorial;
- Technical and coordinative;
- Conditional;
- Tactical (cognitive processes);
- Psychological and social.

Therefore, the content and methods used in training and development programmes for players will have to be selected considering:

- primary requisites (hereditary factors, biological structures),

- perceptive requests, derived from the information available in an extremely variable game environment,
- construction of technical moves that are directly linked to the development of coordination skills,
- construction of an adequate organic and muscular metabolic support,
- development of "tactical thought", creating the necessary decisional pre-requisites for the player,
- an appropriate psychological climate that stimulates motivation and commitment to performance, during training as well as during competitions, which favours a wider opportunity for social interaction.

Soccer, as it is practiced today in every corner of the world, with all its articulations and facets, is a pure invention of 19th-century England. It is the result of the extraordinary changes occurring in that country around the middle of the century: industrial revolution, the gradual extention of spare time to all social classes, the advent of Liberal democracy – which states the new values of urban bourgeoisie – and transport revolution. In these years games as well as popular and noble pastimes were progressively regulated, losing their old connotations of transgression and violence. Therefore, all the interpretations which see soccer as derived from ball games held in ancient times, in particular Roman harpastum or medieval and Renaissance soule, pelota, Florentine soccer, etc., are to be rejected. If we want to establish a somewhat connection between our modern soccer and the games from the past, we need to focus on some popular games played in England from the 13th century on, such as hurling over country and hurling at goal, or folk and street soccer.

Education is the activity aimed at the formation and development of each individual's knowledge as well as his mental, behavioural and social faculties. Such an action takes strong influences from both the historical period and different cultures.

Etymologically, the term "education" is derived from the Latin verb educĕre, namely "to lead out". However, the meaning of education is much broader if intended as the extrapolation and enhancement of potential qualities and skills. The broader and nobler meaning of educĕre constitutes the solid and charming foundation of pedagogy.

It is highly important to clarify that education belongs to community, and not just to the individual. For this reason, it goes beyond the private sphere. The educational path, even starting from the individual, reaches its true essence within the community, in the transition therefore from the single

person to the multitude. These principles generate the profound meaning of modern pedagogical studies, amongst whose objectives are the personal development and formation so that the person acquires and achieves autonomy and responsibility of thought and action. The individual must become able to critically master, apply and transmit cultural, social and existential values. He must become aware and bearer of ethical thought.

The history of Socialsoccer (Socialsoccer) intertwines with its founder's, Massimo Vallati, born in 1976. Massimo's love for soccer goes back to his childhood, when he started playing soccer in the under-eleven group. The passion for sports has become his hallmark ever since, a milestone for the future foundation of Socialsoccer.

Like all real love stories, eventually there are fights: soccer schools, cheering, the hooligans widened the gap between the reality of soccer and the values it promotes. Massimo witnessed the first difficulties occurred on the soccer pitch: due to the scenario of players' agents, the transfer market, bets, doping, extreme competitiveness and, therefore, to the loss of those values, he lost his faith in sports at a young age. Becoming part of an ultras group was pivotal for Massimo, since it further changed his relationship with soccer. Only when Massimo became a policeman did things change: he realized that the violence inside and outside the stadiums, racism, physical and verbal injuries, which became part of soccer games, were not the foundations of his beloved sport.

The idea of Socialsoccer originated then.

In 2005, and 23 years after his last kick, Massimo created a brand new set of soccer rules, Socialsoccer, where the values of hospitality, respect, inclusion and diplomacy took the place of the old ones. Moreover, with his rules Massimo wanted to change soccer as well as reconsider the norms of the real world. According to the philosophy of Socialsoccer, the soccer pitch is, in fact, a metaphor of the social environment. The harmony within the field should progressively extend to the outside world, changing the players' behaviors and perspectives.

The philosophy of Socialsoccer.

"Change soccer to change the world", Socialsoccer's motto, is not a captivating slogan to gather consensus and attention: along with "The winner is the keeper", the objective of the organization is clear.

According to the principles and values promoted by Socialsoccer, soccer is a metaphor of life, building the fundaments of inclusion, respect for other cultures, civic-mindedness and of a sound relationship with society.

Every initiative of Socialsoccer is strongly pedagogic-oriented and has a therapeutic value: furthermore, it intends to highlight the potential rather than the limitations of those people considered difficult to handle.
Socialsoccer's socially inclusive model proves pioneering as it hones one's skills by giving value to everyone's limitations and differences. In line with the rules of Socialsoccer, "looking after the others" and "being loyal", the winning team is the one that promotes the potential of each member, whether he be neurotypical or facing cultural, social, physical or psychic issues.

One of Socialsoccer's methodological techniques is the "non-formal" learning type: as recognized by the Directorate-General for Education and Culture of the European Commission, non-formal learning comprises any learning process which occurs outside the formal learning context (i.e. schools, etc) and fosters the development of skills and knowledge as well as the social development of learners due to its dynamic nature.
Non-formal learning is based on a horizontal relationship between teachers and learners, in which the exchange of skills and knowledge is reciprocal and the learning path is student-centered. The main feature of non-formal learning is "learning by doing", an experiential learning process that enables people to learn from direct experience and establish a strong interaction between learners and their surrounding environment. Moreover, as part of non-formal education, the "peer to peer" learning has become common: this relational method promotes teamwork and enables children to pass down acquired knowledge and to guide those who encounter more problems.
Besides promoting a real inclusion, this inclusive approach makes neurotypical and disabled people interact with one another, proving extremely versatile and, therefore, applicable to different contexts and situations.
As a matter of fact, Socialsoccer's methodology is based on a holistic personal development. Well-being stems from a series of actions that take into consideration those aspects, as the children's psychology, his/her socioeconomic status, the relations involved in his/her civic development, which define a sound self- and other-awareness.

The research project about Socialsoccer

In order to better define our lines of research we are providing the main questions we asked ourselves when designing our research approach to this problem:

1. What exactly is the "Socialsoccer" sporting activity?
2. Could it make any consistent, valid and quantifiable improvements in different aspects of the human beings (under a social, psychological, physiological and physical standpoint)?
3. Are there any quantifiable and consistent differences in these aspects among the different groups that will be exposed to this sporting activity or not (experimental vs. control group)?
4. Are there any quantifiable and consistent differences in these aspects among the different European partners involved in this project?

Methods

1.1 Research Design

This study will apply a cross-sectional design and will be composed of two phases.
Phase 1: Investigating the "SocialSoccer in Europe" (two groups: Experimental vs. Control) – 2017.
Phase 2: Measuring the "SocialSoccer efficacy" (two groups: Experimental vs. Control) – 2019.
The Institutional Research Board (University of Rome "Tor Vergata" Faculty of Medicine Ethical Committee) provided clearance for the procedures before the commencement of this study. All participants were informed that they are free to withdraw from the study at any time without penalty. Written informed consent has been requested to all the participants after familiarization and explanation of the benefit and risks involved in the procedures of this study. All procedures were carried out in accordance with the Declaration of Helsinki of the World Medical Association as regards the conduct of clinical research.

1.1.1 Hypothesis

Our hypothesis is that the SocialSoccer sporting activity may actually promote some interesting changes, consistent and quantifiable, on some of the participants to this study, when compared to the control group practicing soccer in its traditional version.
In particular, our hypothesis considers highly probable a change of attitude towards certain social issues very relevant at this moment in history:
1) Inclusion and social integration.

2) No to any kind of racism and discriminations by gender, age, religion or political beliefs.
3) No to any form of violence.
We assume also highly likely to achieve a level of motor activity, through the SocialSoccer activity, to ensure all those benefits that sport brings about the health of the citizens:
1. Counteracting obesity
2. Preventing diseases such as diabetes, heart disease, musculoskeletal disorders, etc.
3. Improving the lifestyles in the sense of increased daily physical activity and proper nutrition.
4. Preventing any form of addiction (smoking, drugs, alcohol, etc.).
5. Allowing considerable improvements in physical and mental health in populations with special needs or disabilities.

1.1.2 Set of Variables

The variables considered in this study will be referring to certain measures relating to different areas of the personality (psychological and sociological variables) and of the body (physiological and biomechanical variables) of the participants. In this study, they will be considerate as dependent variables.
As independent variables, we will consider:

- being part of the experimental group (E_g) or the control group (C_g)
- where the study is carried out
- the nationalities
- the gender
- the age class
- the previous motor experiences and the present training status
- in case, the possible type of disability.

1.2 Sample

In order to study the effects of "SS" and “TS” (set as independent variables) on the identified factors (dependent variables), 10 groups (experimental and control groups) have been involved in this research

project. Each group were composed of 30 people, ranging from an age of 11 to 14.

Table 1 – Participants – Sample Size

	Experimental Group "SS"*	Control Group "TS"**	total
Italy	30	30	60
UK	30	30	60
France	30	30	60
Hungary	30	30	60
Bulgaria	30	30	60
Germany***	30	30	60
Total	150	150	360

*** Socialsoccer - **Traditional Soccer - *** Germany joined the project in 2018, replacing France**

Table 2 – Participants – Biodata

	Mean	Standard Error	Std Deviation
Height (m)	1,546	0,008	0,112
Weight (kg)	43,827	0,729	9,622
Soccer Experience (yrs)	4,403	0,185	2,142

1.3 Procedures

This scientific report illustrates the research phases developed in the framework of the CROSS Erasmus + project. The section that illustrates the study conducted on the physical and the soccer technical part of the project is based on the proposal made by Castagna et Al, Filetti et Al., Padulo et Al, Ruscello et Al. (Filetti, Ruscello, Ascenzi, Di Mascio, & D'Ottavio, 2019; Filetti, Ruscello, D'Ottavio, & Fanelli, 2017; Ruscello et al., 2015; Ruscello et al., 2018; Ruscello, Partipilo, Pantanella, Esposito, & D'Ottavio, 2016; Ruscello et al., 2013) Rowat et al. (Rowat, Fenner, & Unnithan, 2017) Castagna et Al, D'Ottavio et al. (Castagna, D'Ottavio, Cappelli, & Povoas, 2019; Castagna, Francini, Povoas, & D'Ottavio, 2017; Castagna, Krustrup, et al., 2018; Castagna, Lorenzo, et al., 2018; Castagna, Varley, Povoas, & D'Ottavio, 2017; Padulo, D'Ottavio, Pizzolato, Smith, & Annino, 2012).
A vast reference section is provided along with this paper.

1.3.1 Performance Tests

1.3.1.1 Physical Testing

The yo-yo intermittent recovery test level 1 (YYIRT1) is a well-validated and well-documented test, for young players too, that is used to measure the aerobic capacity of the participants. The participants were instructed to perform a series of 20 m shuttle runs, synchronized, following a cadence set by an audio metronome with a 10-second rest interval between every 40 m. As the test continued the interval time between the signals reduced and the participants had to increase their speed accordingly. The objective for players was to perform as many shuttles as possible until exhaustion. Participants were given one warning to catch up after the first missed signal. The results used in the analysis corresponded to the total number of the metres covered.
A 30 m sprint test were also administered where participants had to complete two trials of 30 m maximal sprint with a walk back recovery between each test and a total recovery time of 2 minute between each sprint. Acceleration time over 10 m were also computed by the means of electric photocells.
At the end of physical testing we had the following information, about the participants:

- Aerobic capacity (YYIRT1)
- Acceleration form a still standing position ($m*s^{-2}$) – 10 m
- Sprint capacity – speed ($m*s^{-1}$).

1.3.1.2 Soccer Skill tests

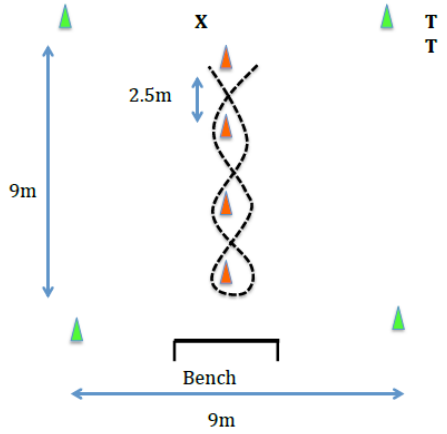
The battery of skills tests to be administered included four tests. The tests were administered in station format in no specific order. A familiarization of the technical skills tests and a verbal explanation and demonstration were given to participants prior the start of each test.

Skill Test 1 – dribbling with a pass

For the test dribbling with a pass four (4) cones were placed in a line 2.25 m apart within a 9 x 9 square and a flat bench measuring 1.5 m x 0.30 m was placed on the end line. Participants were instructed to dribble the ball around the first four cones in slalom fashion, complete a wall pass against

the bench and dribble around the four cones back to the starting line. The objective was to complete the exercise in the fastest time possible without knocking over cones, stepping out of the square and controlling the ball only with feet. If a cone was knocked over, participants had to place it upright and continue with the test. Electronic chronograph were used to measure the time spent from the beginning to the end of the trial. (Figure 1).

Figure 1: Diagram of test set up for skill test 1 - Dribbling skill test with pass



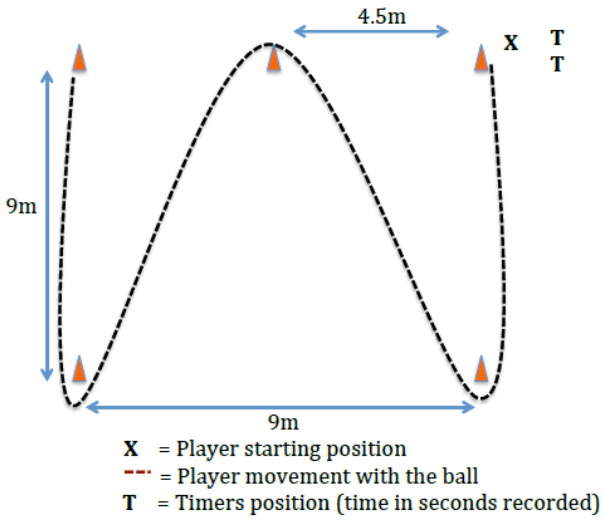
X = Player starting and finishing position with the ball
--- = Player movement with the ball
T = Timers position (time in seconds recorded)

Skill Test 2 – dribbling speed

For the test of dribbling speed, a cone were placed on each corner of a 9 x 9m square. A fifth cone were placed midway (4.5 m) on the line of where the test began. Therefore, one end had three cones (one at each corner and a third midway) and the other had two cones (one at each corner). Beginning at one corner, the participant had to dribble around the three cones (corner directly opposite the starting cone, the cone placed midway, and the cone diagonally opposite the starting cone) in slalom fashion, and dribble the ball into the fifth cone (i.e. not with a pass). The objective were to complete the drill in the fastest time possible by controlling the ball only with feet without knocking down the cones. If a cone were knocked down, the participant will have to place it upright and continue the test. The overall slalom distance were therefore about 40 m. Electronic chronograph

will be used to measure the time spent from the beginning to the end of the trial. (Figure 2).

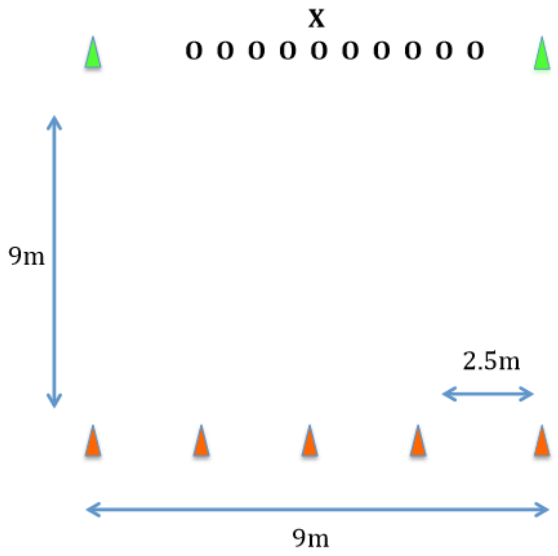
Figure 2: Diagram of test set up for skill test 2 - Dribbling speed



Skill Test 3 – passing drill

For the passing drill five targets were placed 2.5 m apart at the end of a 9 x 9 m square. The participant were instructed to stand outside the square at the opposite line of the target. The objective was to hit the targets in succession from one to five with two attempts, being allowed for each target for a total of ten attempts. The score that were used for the analysis were recorded as the number of targets hit successfully, the maximum score being ten (figure 3).

Figure 3: Diagram of test set up for skill test 3 - Passing

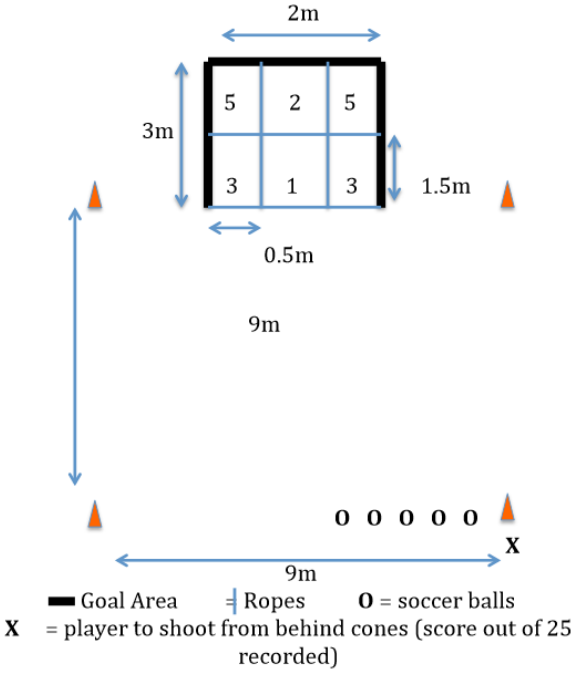


X = Players to stand behind green cones (players have two passing attempts at each cone)
O = soccer balls
Score out of 10 recorded

Skill Test 4 – shooting accuracy

Shooting accuracy were measured by participants having five attempts at kicking a ball at a 2 x 3 m goal set up on the end line of a 9 x 9 m square. The target was divided by a rope into six sections. One rope was placed horizontally between the posts at a height of 1.5 m. Two ropes were dropped from crossbar, 0.5 m from each post. The scoring allocation of points was as follows: five points for the upper right and upper left sections and two points for the upper middle section. Three points were allocated for the lower right and lower left sections and one point for the lower middle section. Players stood at the opposite line of the goal with the total score from all five kicks being recorded used in the analysis. The maximum score possible was 25 points (figure 4).

Figure 4: Diagram of test set up for skill test 4 - Shooting accuracy



1.3.1.3 Technical evaluation

Each qualified coach participating to this project was asked to provide a technical and objective evaluation for each player of his/her team, involved in the study, through the observation of a match/tournament of 5 vs 5 (Small Sided Game). All players were evaluated with regard to their performance on ten soccer elements:

1. First touch
2. Awareness and overall control,
3. Control from the air
4. Short passing (under 10 m)
5. Long passing (over 10 m)
6. Dribbling
7. Turning
8. Shooting accuracy
9. Two footedness
10. Attitude.

Each element was given a point between 1-5. Each point described a player's performance as follows: 1- very poor; 2-poor; 3-fair; 4-good and 5-very good.

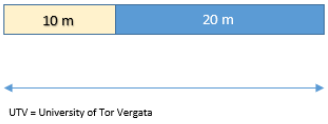
"5 vs 5" Tournament Rules

Two pitches will be marked out each measuring 30 m (length) x 25 m (width). The pitch has two goals measuring 2.4 m x 1.2 m placed midway (i.e. 15 m) along the goal line. The players will be randomly allocated into the teams participating. The game will last five minutes with a 3-minute passive rest period given between matches.

The rules of the games include no goalkeepers, players could have unlimited touches with the ball and players could not be offside. If the ball goes out of play, players will pass the ball into the field instead of throw-ins. Verbal coach encouragement and feedback will be not allowed in the games.

BLOCK 1 – Physical Testing

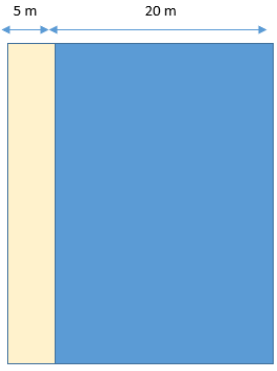
Sprint Test (10-30 m) (Electronic timing – provided by UTV)



UTV = University of Tor Vergata

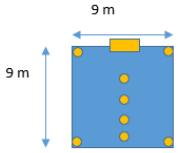
PICTURE 1

Yo-Yo Intermittent Recovery Test 1 (loudspeakers needed)



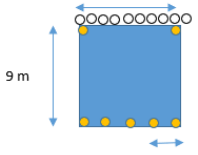
BLOCK 2 – Technical Testing

Dribbling with a Pass Test (Electronic timing – by UTV)



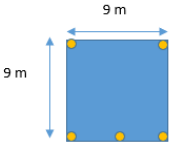
(1 Bench, 2 balls - n.4, 8 Witches Hat WH

Passing test (10 balls n. 4, 7 WH)



BLOCK 3 – Technical Testing

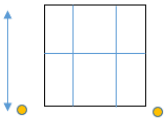
Dribbling speed (Electronic timing – by UTV)



(2 balls - n.4, 5 WH)

Shooting Accuracy Test

(5 balls n. 4; ropes; 4 WH)



1.4 Instrumentation

The tests performance were assumed as total time and assessed using a telemetric photocells system (Witty Wireless Training Timer, Microgate, Bolzano, Italy). To avoid undue switch-on of the timing system, players had to position the front foot immediately before a line set 0.3 m from the photocell beam. The photocell beam was positioned at 1 m height and 2 m apart. All the players performed the tests with a self-administered start, and maximum performance was induced through strong verbal encouragements by the same test administrator during all the test duration.

1.5 Statistical Analysis

All the collected data are presented as mean and standard deviation (M±SD) and 95% confidence intervals (95% CIs). The assumption of normality was assessed using the Kolmogorov-Smirnov or the Shapiro-Wilk test. Parametric and nonparametric statistics were used when appropriate. Normative data are reported as percentile range. The Intraclass Correlation Coefficients (ICC) are provided as indices of relative reliability of the tests.
To identify significant differences over time in the considered variables (within), the analysis of variance for repeated measures was performed, for each test. After performing the Mauclhy test of sphericity, the Greenhouse-Geisser ε, was used when appropriate.
To test the main effect and the interactions between factors (independent variables) the factor analysis of variance was performed.
Effect Size (ES) in ANOVA was computed as ω^2, to assess meaningfulness of differences, with $\omega^2 < 0.01$, $0.01 < \omega^2 < 0.06$, $0.06 < \omega^2 < 0.14$ and $\omega^2 > 0.14$, as trivial, small, moderate, and large ES, respectively.
Pearson's product moment of correlations among the different tests was also performed. The corresponding P values was provided for each analysis. The value of statistical significance is accepted with $P \leq 0.05$.
IBM - SPSS 20.0 for Windows was used to analyze and process the collected data.

Results

2.1 Physical Testing

We are now providing the results recorded during physical testing (10-30 m, Yo-Yo IR1 test), in the two different period of evaluation (2017-2019).
We are now providing the results recorded during physical testing (10-30 m, Yo-Yo IR1 test), in the two different period of evaluation (2017-2019).

2.1.1. Test 10 m – first testing (2017)

Table 3 – Test 10 m – Descriptive Statistics

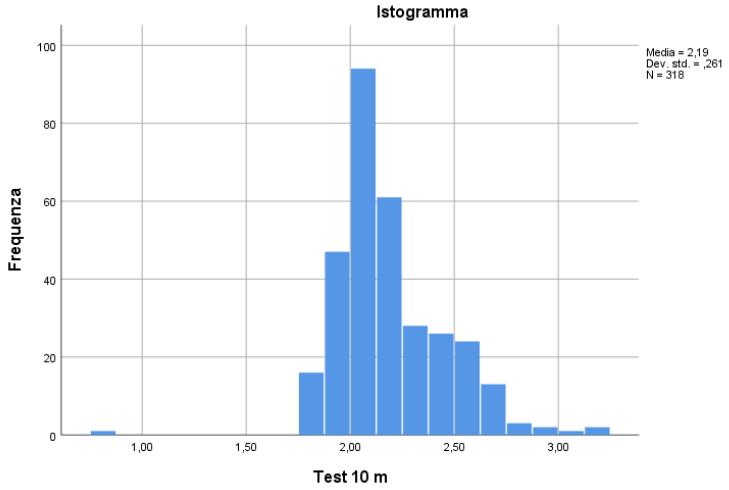
			Statistics	Std Error
Test 10 m	Mean		2,185	0,01464
	95% confidence interval for the mean	Lower limit	2,156	
		Upper limit	2,214	
	Average cut out at 5%		2,173	
	Median		2,130	
	Variance		0,068	
	Std. deviation		0,26103	
	Minimum		0,85	
	Maximum		3,19	
	Interval		2,34	
	Interquartile interval		0,30	
	Asymmetry		0,551	0,137
	Curtosis		2,876	0,273

Table 4 – Test 10 m – Percentiles

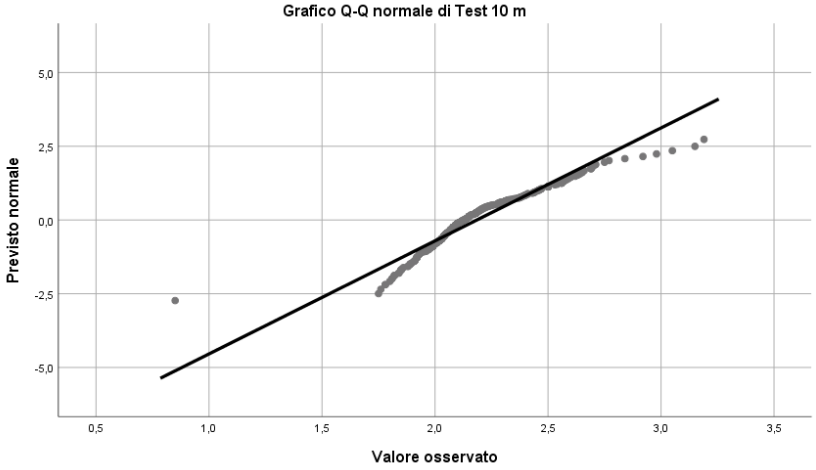
		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test 10 m	1,8500	1,9200	2,0200	2,1300	2,3200	2,5610	2,6505
Cardini di Tukey	Test 10 m			2,0200	2,1300	2,3200		

Table 5 – Test 10 m – Normality tests

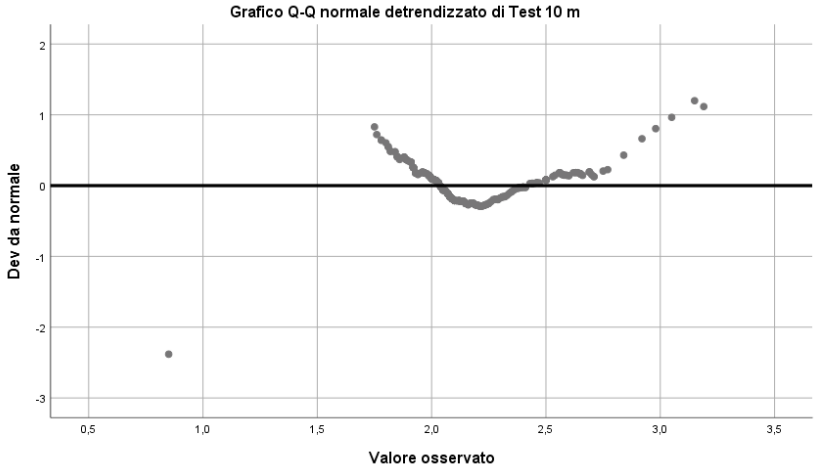
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test 10 m	0,120	318	0,000	0,927	318	0,000



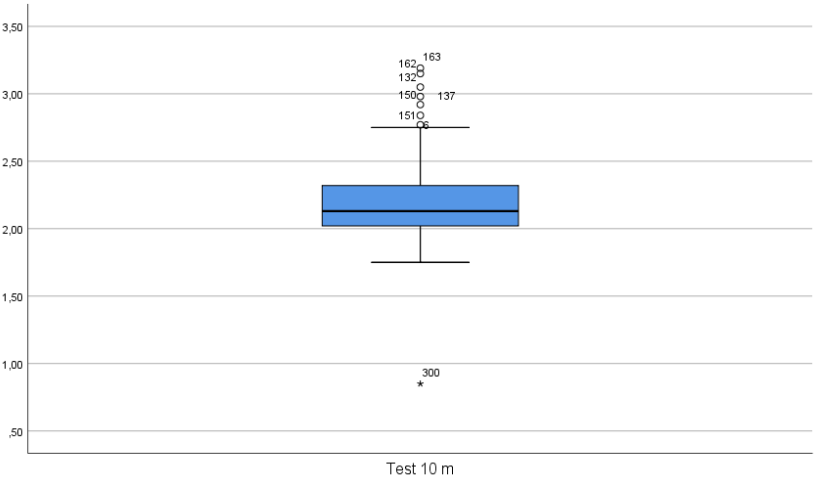
Graph 1 – Test 10 m – Histogram



Graph 2 – Test 10 m – Q-Q normal



Graph 3 – Test 10 m – Q-Q de-trended normal graph



Graph 4 – Test 10 m – Box Chart

Independent Test t: Control vs Experimental group (10 m)

Table 6 - Control vs Experimental group: descriptive statistics (10 m)

Test 10 m	Group	Mean	Std.Deviation	Standard error
	Control	2,177	0,200	0,019
	Experimental	2,181	0,298	0,029

Table 7 - Control vs Experimental group: independent test t (10 m)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Test 10 m	Varianze uguali presunte	8,663	0,004	-,122	200	0,903	-0,00436	0,03580	-0,0749	0,0662
	Varianze uguali non presunte			-,122	174,910	0,903	-0,00436	0,03580	-0,0750	0,0663

2.1.1.1 Comparative Analysis by Country – 10 m

Table 8 – Comparative analysis by country (10 m): descriptive statistics and ANOVA

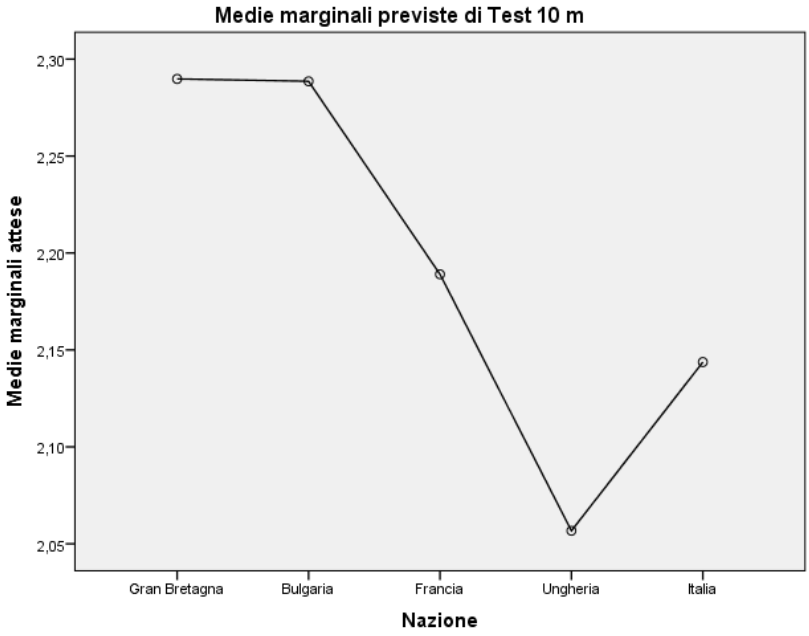
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	2,29	0,28	46,00
Bulgaria	2,29	0,27	70,00
Francia	2,19	0,29	81,00
Ungheria	2,06	0,12	73,00
Italia	2,14	0,17	48,00
Totale	2,19	0,25	318,00

Test degli effetti fra soggetti

Variabile dipendente: Test 10 m

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	2,537[a]	4,000	0,634	11,416	0,000	0,127
Intercetta	1451,021	1,000	1451,021	26119,098	0,000	0,988
Nation	**2,537**	**4,000**	**0,634**	**11,416**	**0,000**	**0,127**
Errore	17,388	313,000	0,056			
Totale	1542,721	318,000				
Totale corretto	19,925	317,000				

a. R quadrato = ,127 (R quadrato corretto = ,116)



Graph 5 – Test 10 m – ANOVA

2.1.2 Test 10 m – second testing (2019)

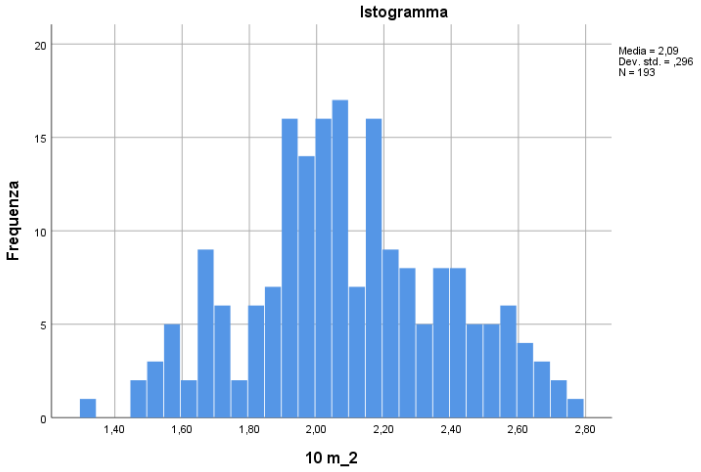
Table 9 – Test 10 m – Descriptive Statistics

			Statistica	Errore std.
10 m_2	Mean		2,0888	0,02131
	95% confidence interval for the mean	Lower limit	2,0468	
		Upper limit	2,1308	
	Average cut out at 5%		2,0893	
	Median		2,0700	
	Variance		0,088	
	Std. deviation		0,29602	
	Minimum		1,32	
	Maximum		2,75	
	Interval		1,43	
	Interquartile interval		0,38	
	Asymmetry		0,022	0,175
	Curtosis		-0,420	0,348

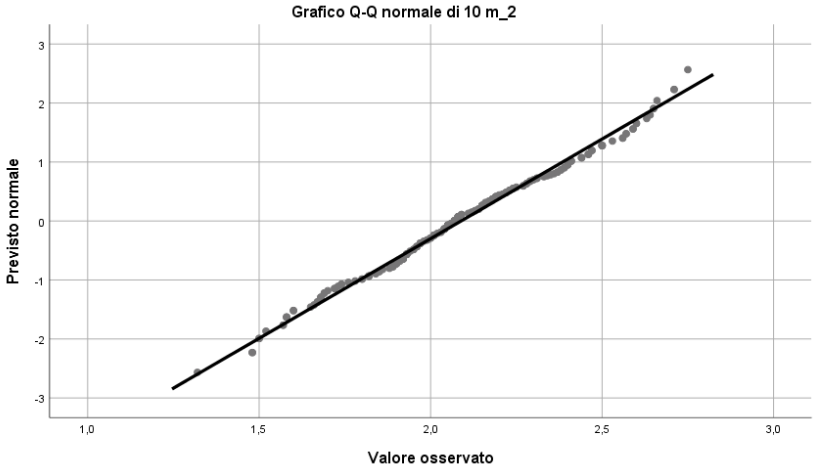
Table 10 – Test 10 m – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
10 m_2	,051	193	,200*	,990	193	,205

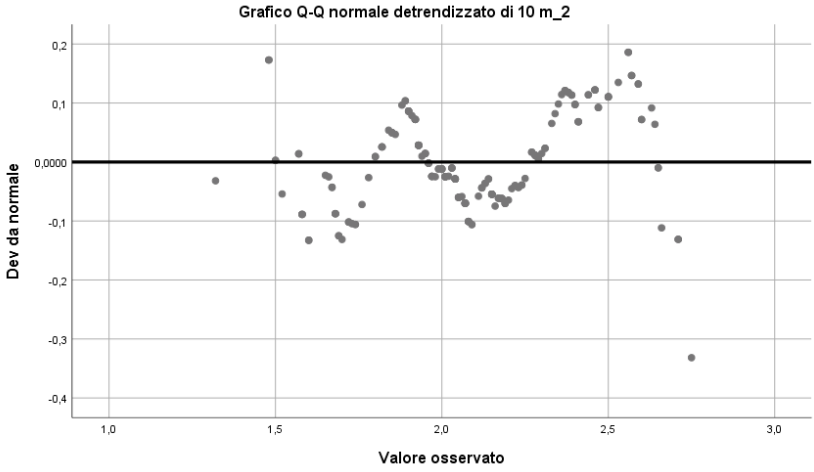
*. Questo è un limite inferiore della significatività effettiva.
a. Correzione di significatività di Lilliefors



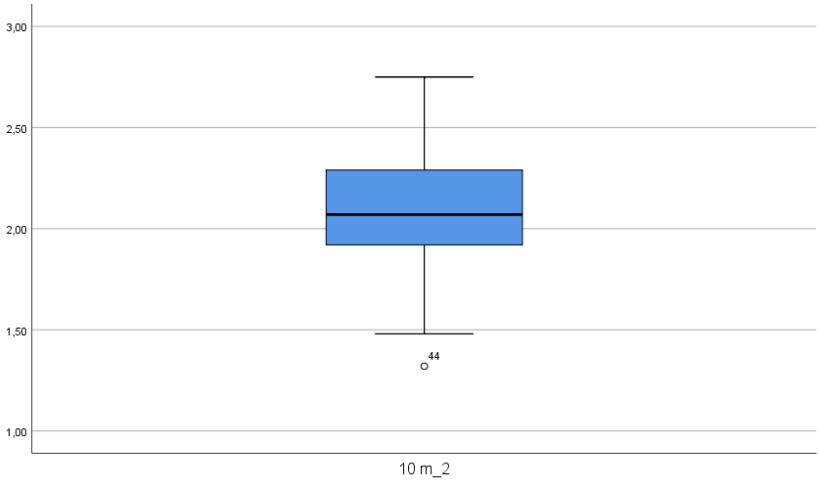
Graph 6 – Test 10 m – Histogram



Graph 7 – Test 10 m – Q-Q normal



Graph 8 – Test 10 m – Q-Q de-trended normal graph



Graph 9 – Test 10 m – Box Chart

Independent Test t: Control vs Experimental group (10 m)

Table 11 - Control vs Experimental group: descriptive statistics (10 m)

10 m_2	Group	Mean	Std.Deviation	Standard error
	Control	2,0475	0,27541	0,02768
	Experimental	2,1323	0,31185	0,03216

Table 12 - Control vs Experimental group: independent test t (10 m)

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
									Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Inferiore	Superiore
10 m_2	Varianze uguali presunte	1,136	,288	-2,006	191	0,046	-,08487	,04230	-,16830	-,00143
	Varianze uguali non presunte			-2,000	185,306	0,047	-,08487	,04244	-,16858	-,00115

2.1.3 Test 30 m – first testing (2017)

Table 13 – Test 30 m – Descriptive Statistics

			Statistica	Errore std.
Test 30 m	Mean		5,196	0,024
	95% confidence interval for the mean	Lower limit	5,150	
		Upper limit	5,243	
	Average cut out at 5%		5,184	
	Median		5,160	
	Variance		0,186	
	Std. deviation		0,431	
	Minimum		4,240	
	Maximum		6,910	
	Interval		2,670	
	Interquartile interval		0,413	
	Asymmetry		0,660	0,133
	Curtosis		1,081	0,266

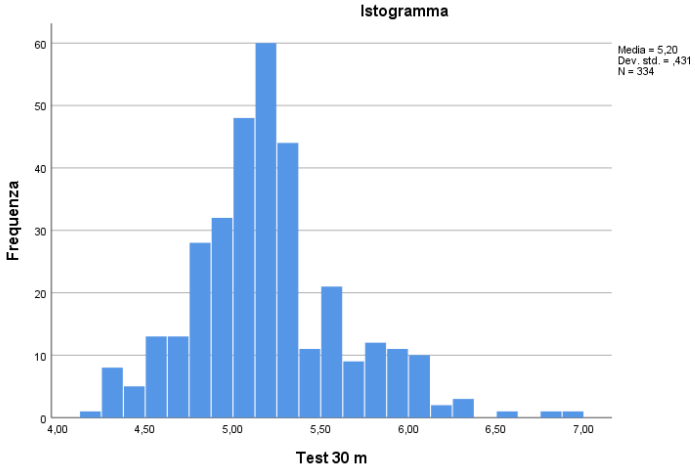
Table 14 – Test 30 m – Percentiles

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test 30 m	4,560	4,690	4,950	5,160	5,363	5,820	6,030
Cardini di Tukey	Test 30 m			4,950	5,160	5,360		

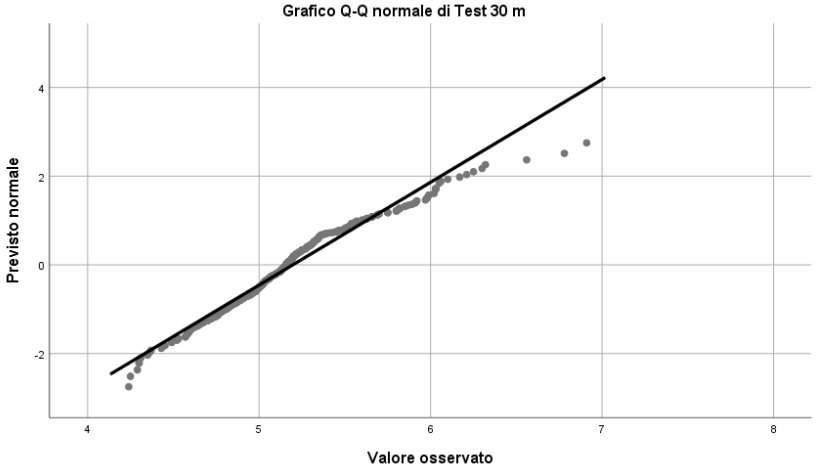
Table 15 – Test 30 m – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test 30 m	0,106	334	0,000	0,968	334	0,000

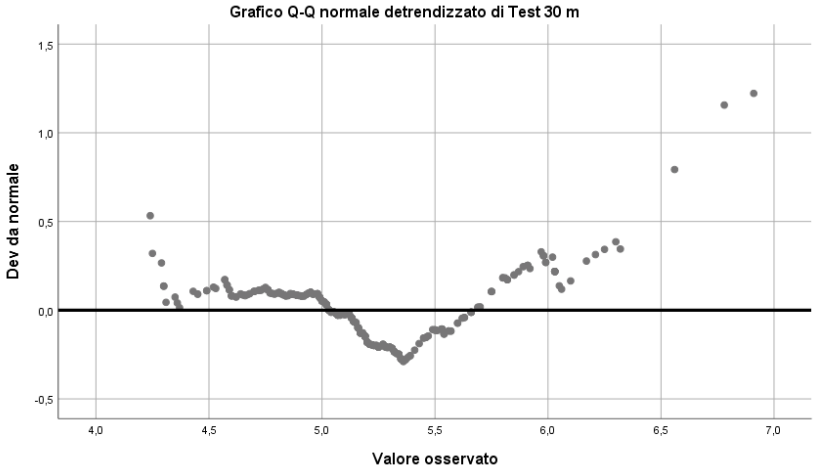
a. Correzione di significatività di Lilliefors



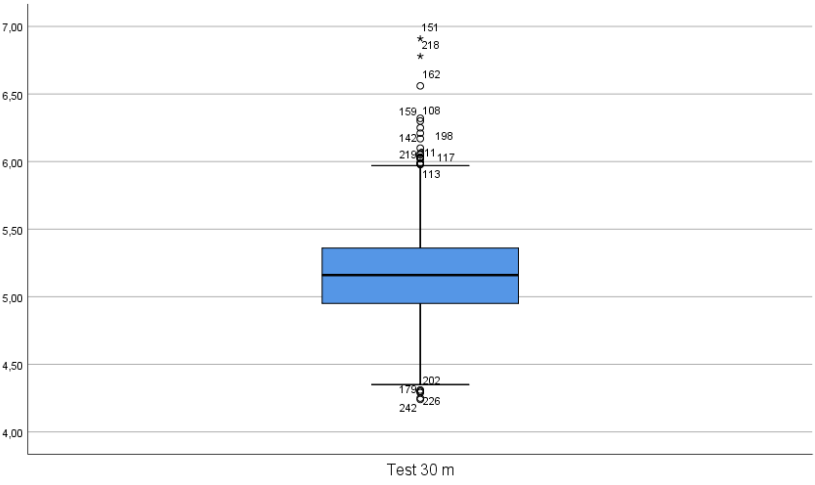
Graph 10 – Test 30 m – Histogram



Graph 11 – Test 30 m – Q-Q normal



Graph 12 – Test 30 m – Q-Q de-trended normal graph



Graph 13 – Test 30 m – Box Chart

Independent Test t: Control vs Experimental group (30 m)

Table 16 - Control vs Experimental group: descriptive statistics (30 m)

Test 30 m	Group	Mean	Std.Deviation	Standard error
	Control	5,173	0,341	0,034
	Experimental	5,333	0,524	0,048

Table 17 - Control vs Experimental group: independent test t (30 m)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Test 30 m	Varianze uguali presunte	20,368	0,000	-2,641	216	0,009	-0,16110	0,06100	-0,28133	-0,04087
	Varianze uguali non presunte			-2,721	201,427	0,007	-0,16110	0,05920	-0,27784	-0,04436

2.1.3.1 Comparative Analysis by Country – 30 m

Table 18 – Comparative analysis by country (30 m): descriptive statistics and ANOVA

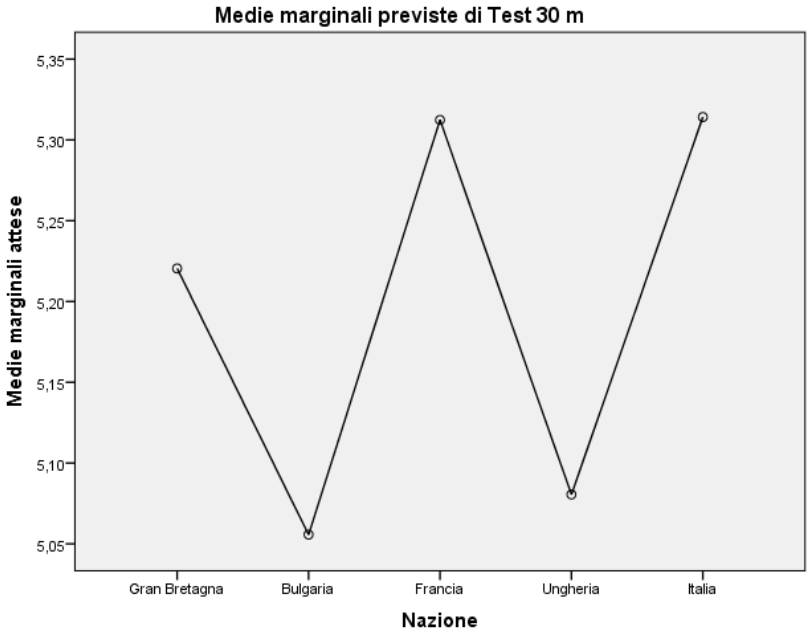
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	5,22	0,36	46,00
Bulgaria	5,06	0,41	70,00
Francia	5,31	0,46	81,00
Ungheria	5,08	0,35	76,00
Italia	5,31	0,51	48,00
Totale	5,19	0,43	321,00

Test degli effetti fra soggetti

Variabile dipendente: Test 30 m

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	4,168[a]	4,000	1,042	5,936	0,000	0,070
Intercetta	8197,082	1,000	8197,082	46700,027	0,000	0,993
Nation	**4,168**	**4,000**	**1,042**	**5,936**	**0,000**	**0,070**
Errore	55,466	316,000	0,176			
Totale	8701,452	321,000				
Totale corretto	59,634	320,000				

a. R quadrato = ,070 (R quadrato corretto = ,058)



Graph 14 – Test 30 m – ANOVA

2.1.4 Test 30 m – second testing (2019)

Table 19 – Test 30 m – Descriptive Statistics

			Statistica	Errore std.
30 m_2	Mean		5,0121	0,03671
	95% confidence interval for the mean	Lower limit	4,9397	
		Upper limit	5,0845	
	Average cut out at 5%		5,0028	
	Median		5,0200	
	Variance		0,260	
	Std. deviation		,50997	
	Minimum		3,94	
	Maximum		6,78	
	Interval		2,84	
	Interquartile interval		0,69	
	Asymmetry		0,278	0,175
	Curtosis		0,038	0,348

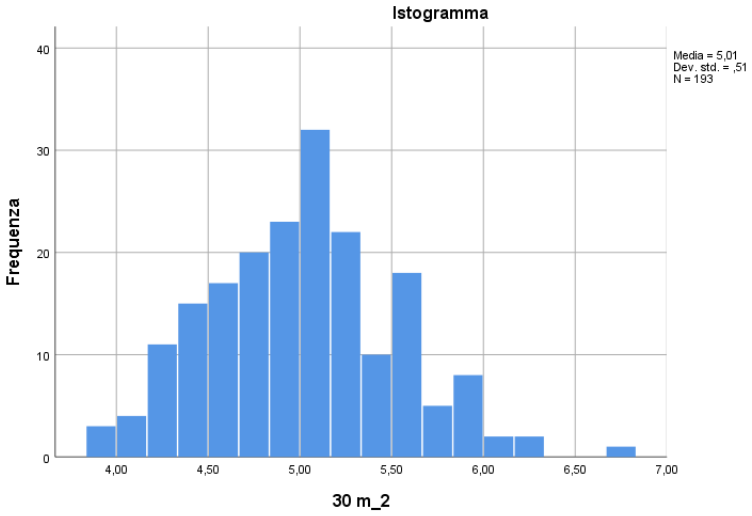
Table 20 – Test 30 m – Percentiles

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	30 m_2	4,1970	4,3400	4,6200	5,0200	5,3150	5,6600	5,9350
Cardini di Tukey	30 m_2			4,6200	5,0200	5,3100		

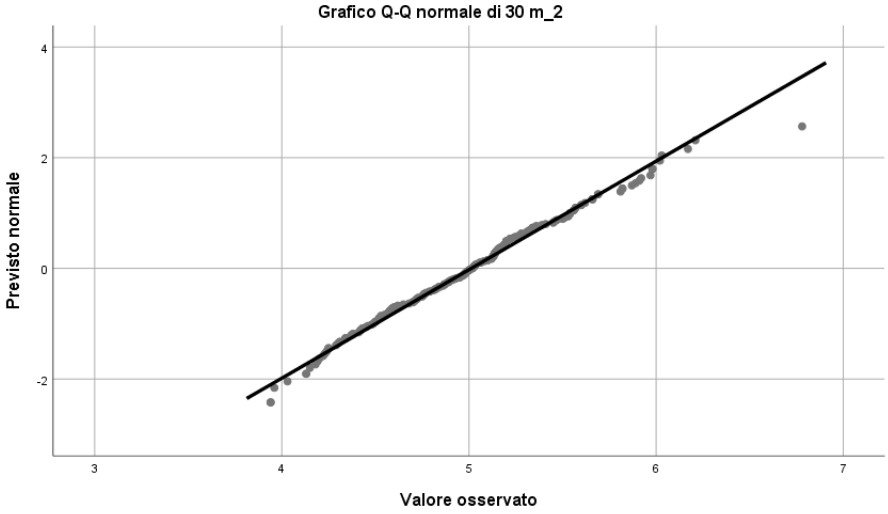
Table 21 – Test 30 m – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
30 m_2	0,056	193	0,200*	0,990	193	0,181

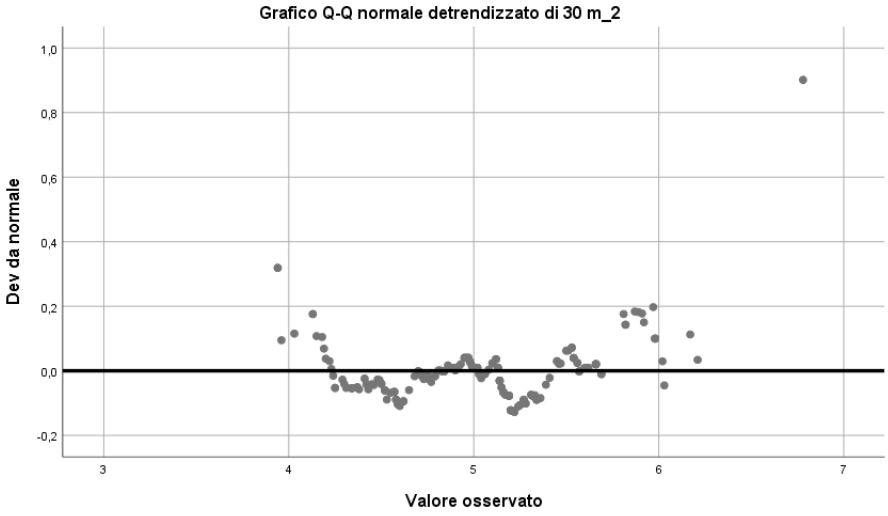
*. Questo è un limite inferiore della significatività effettiva.
a. Correzione di significatività di Lilliefors



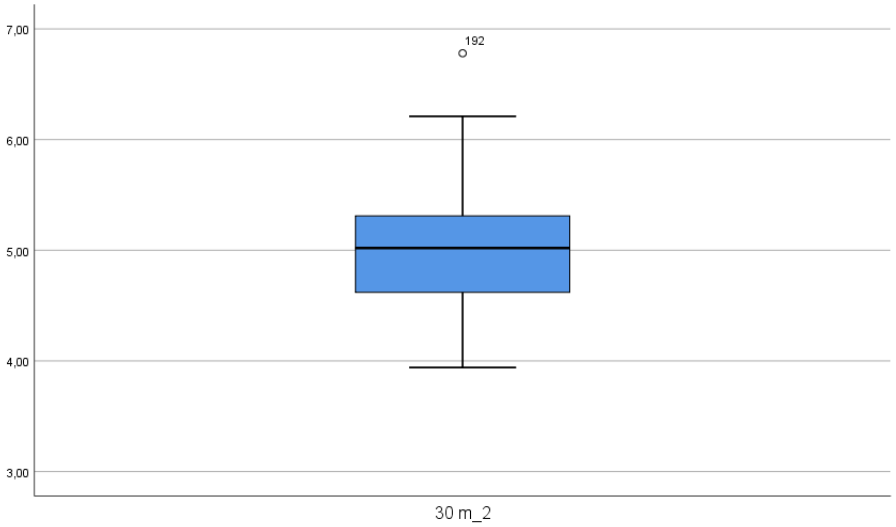
Graph 15 – Test 30 m – Histogram



Graph 16 – Test 30 m – Q-Q normal



Graph 17 – Test 30 m – Q-Q de-trended normal graph



Graph 18 – Test 30 m – Box Chart

Independent Test t: Control vs Experimental group (30 m)

Table 22 - Control vs Experimental group: descriptive statistics (30 m)

30 m_2	Group	Mean	Std.Deviation	Standard error
	Control	4,9116	0,45826	0,04606
	Experimental	5,1180	0,54180	0,05588

Table 23 - Control vs Experimental group: independent test t (30 m)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
30 m_2	Varianze uguali presunte	2,570	,111	-2,862	191	0,005	-,20636	0,07210	-0,34859	-0,06414
	Varianze uguali non presunte			-2,850	182,392	0,005	-,20636	0,07242	-0,34924	-0,06348

2.1.5 Test Yo-Yo IR1 – first testing (2017)

Table 24 – Test Yo-Yo IR1 – Descriptive Statistics (min)

			Statistica	Errore std.
Yo-Yo IR1	Mean		13,8108	,11246
	95% confidence interval for the mean	Lower limit	13,5889	
		Upper limit	14,0328	
	Average cut out at 5%		13,9151	
	Median		14,1000	
	Variance		2,239	
	Std. deviation		1,49620	
	Minimum		8,64	
	Maximum		16,80	
	Interval		8,16	
	Interquartile interval		1,70	
	Asymmetry		-1,088	,183
	Curtosis		1,645	,363

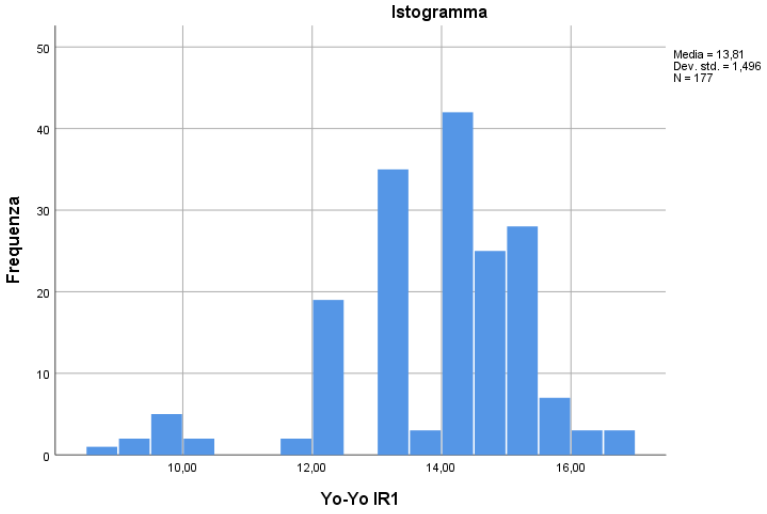
Table 25 – Test Yo-Yo IR1 – Percentiles

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Yo-Yo IR1	10,2640	12,0860	13,1000	14,1000	14,8000	15,4000	15,7000
Cardini di Tukey	Yo-Yo IR1			13,1000	14,1000	14,8000		

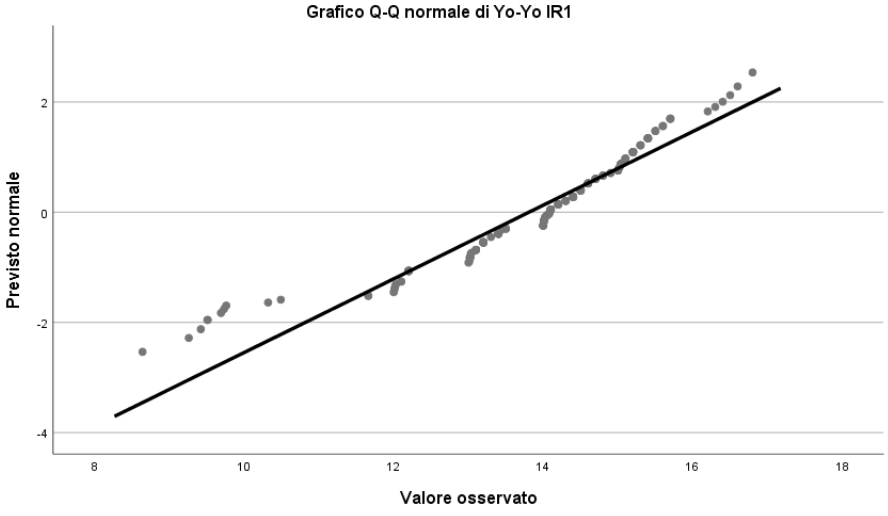
Table 26 – Test Yo-Yo IR1 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Yo-Yo IR1	,160	177	,000	,923	177	,000

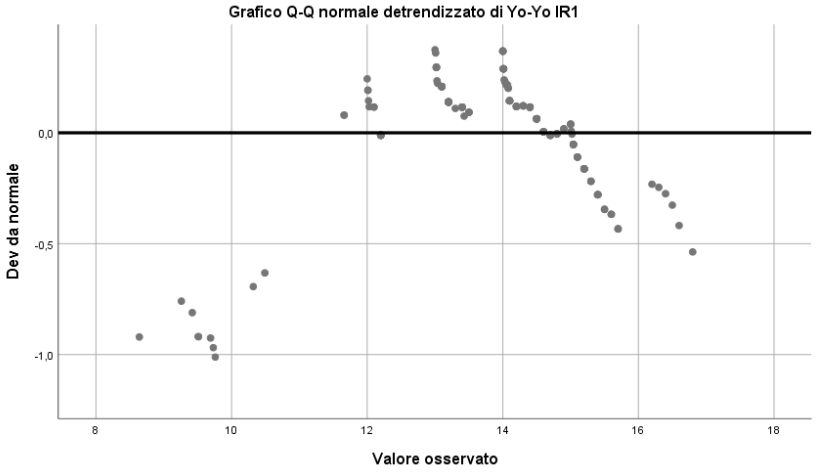
a. Correzione di significatività di Lilliefors



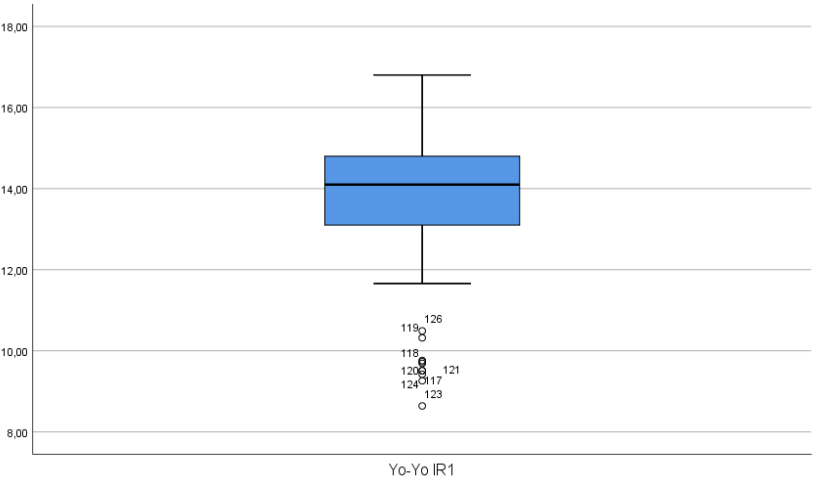
Graph 19 – Test Yo-Yo IR1 – Histogram



Graph 20 – Test Yo-Yo IR1 – Q-Q normal



Graph 21 – Test Yo-Yo IR1 – Q-Q de-trended normal graph



Graph 22 – Test Yo-Yo IR 1 – Box Chart

Independent Test t: Control vs Experimental group (yo-yo IR1)

Table 27 - Control vs Experimental group: descriptive statistics (Yo-Yo IR1)

Yo-Yo IR1	Group	Mean	Std.Deviation	Standard error
Yo-Yo IR1	Controllo	14,165	0,906	0,133
	Sperimentale	13,198	2,030	0,259

Table 28 - Control vs Experimental group: independent test t (Yo-Yo IR1)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Yo-Yo IR1	Varianze uguali presunte	17,957	0,000	3,010	105	0,003	0,967	0,321	0,330	1,604
	Varianze uguali non presunte			3,309	87,728	0,001	0,967	0,292	0,386	1,548

2.1.5.1 Comparative Analysis by Country – Yo-Yo IR1

Table 29 – Comparative analysis by country (Yo-Yo IR1): descriptive statistics and ANOVA

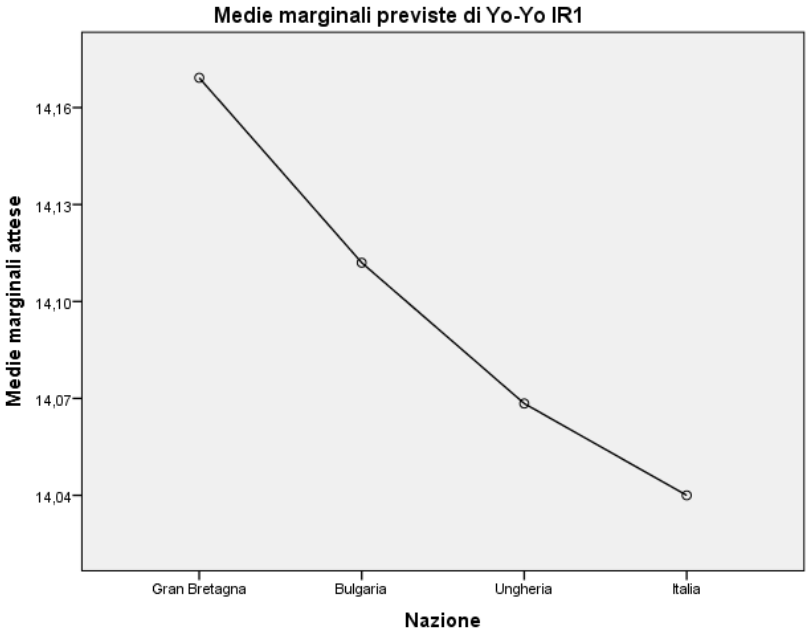
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	14,17	1,49	13,00
Bulgaria	14,11	1,04	70,00
Ungheria	14,07	1,07	76,00
Italia	14,04	1,28	5,00
Totale	14,09	1,09	164,00

Test degli effetti fra soggetti

Variabile dipendente: Yo-Yo IR1

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	,161[a]	3,000	0,054	0,044	0,988	0,001
Intercetta	10447,243	1,000	10447,243	8603,218	0,000	0,982
Nation	**0,161**	**3,000**	**0,054**	**0,044**	**0,988**	**0,001**
Errore	194,295	160,000	1,214			
Totale	32772,229	164,000				
Totale corretto	194,455	163,000				

a. R quadrato = ,001 (R quadrato corretto = -,018)



Graph 23 – Test Yo-Yo IR1 – ANOVA

2.1.6 Test Yo-Yo IR1 – second testing (2019)

Table 30 – Test Yo-Yo IR1 – Descriptive Statistics (min)

			Statistica	Errore std.
Yo-Yo IR1_2	Mean		14,0185	,08872
	95% confidence interval for the mean	Lower limit	13,8432	
		Upper limit	14,1938	
	Average cut out at 5%		14,0463	
	Median		14,1000	
	Variance		1,165	
	Std. deviation		1,07927	
	Minimum		11,20	
	Maximum		15,70	
	Interval		4,50	
	Interquartile interval		1,78	
	Asymmetry		-,505	,199
	Curtosis		-,704	,396

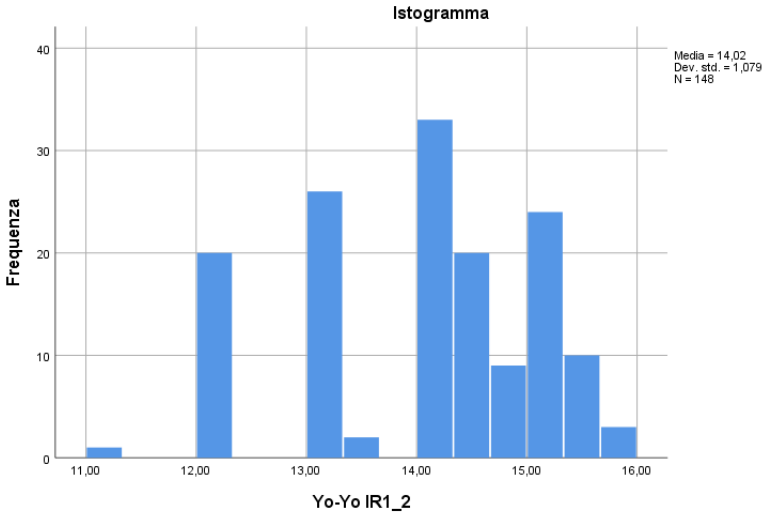
Table 31 – Test Yo-Yo IR1 – Percentiles

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Yo-Yo IR1_2	12,1000	12,2000	13,2000	14,1000	14,9750	15,3000	15,4550
Cardini di Tukey	Yo-Yo IR1_2			13,2000	14,1000	14,9500		

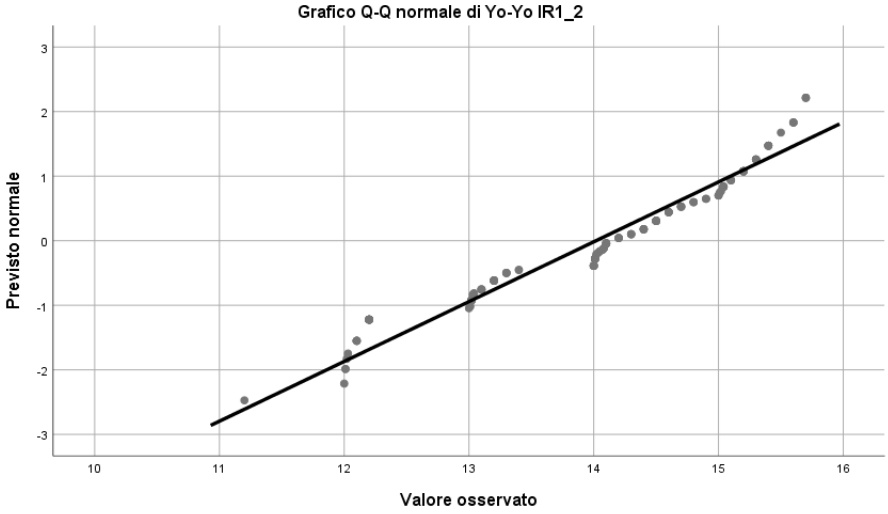
Table 32 – Test Yo-Yo IR1 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Yo-Yo IR1_2	,162	148	,000	,939	148	,000

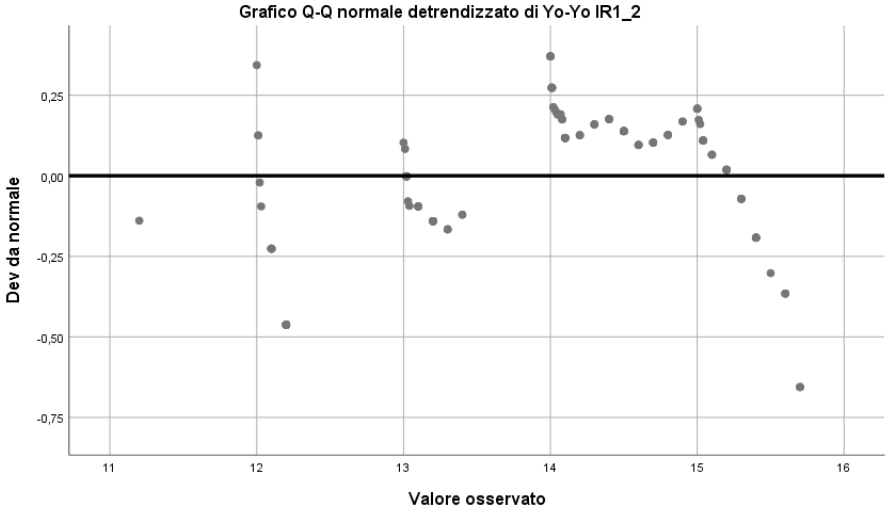
a. Correzione di significatività di Lilliefors



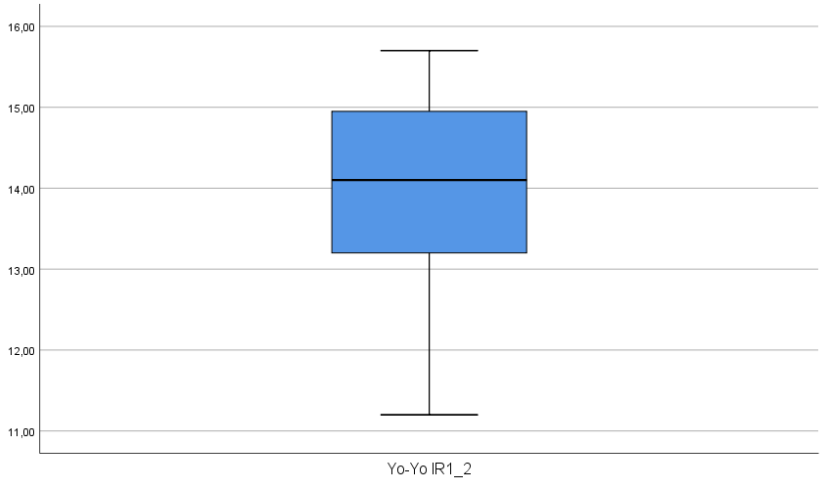
Graph 24 – Test Yo-Yo IR1 – Histogram



Graph 25 – Test Yo-Yo IR1 – Q-Q normal



Graph 26 – Test Yo-Yo IR1 – Q-Q de-trended normal graph



Graph 27 – Test Yo-Yo IR 1 – Box Chart

Independent Test t: Control vs Experimental group (yo-yo IR1)

Table 33 - Control vs Experimental group: descriptive statistics (Yo-Yo IR1)

Yo-Yo IR1_2	Group	Mean	Std.Deviation	Standard error
	Control	14,4666	0,85458	0,09739
	Experimental	13,5325	1,09215	0,12961

Table 34 - Control vs Experimental group: independent test t (Yo-Yo IR1)

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Yo-Yo IR1_2	Varianze uguali presunte	9,965	,002	5,818	146	0,000	,93409	,16054	,61681	1,25137
	Varianze uguali non presunte			5,762	132,463	0,000	,93409	,16212	,61340	1,25478

2.2 Technical Testing

2.2.1 Technical Test n 1 - first testing (2017)

The recorded values are expressed in seconds (s)

Table 35 – Technical Test n 1 – Descriptive Statistics (s)

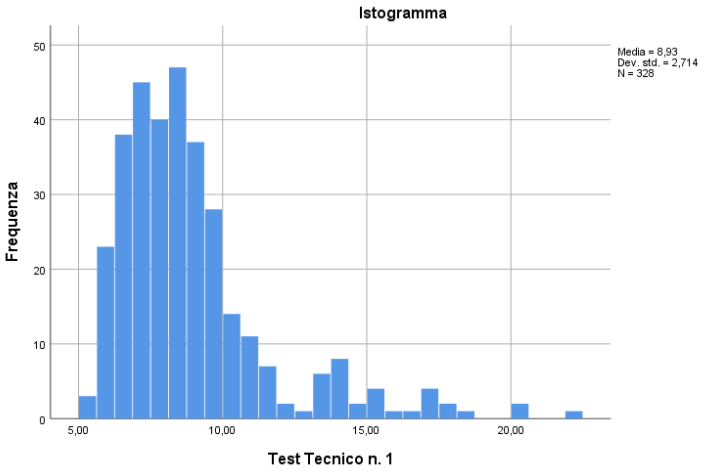
			Statistica	Errore std.
Test Tecnico n. 1	Mean		8,9250	0,14988
	95% confidence interval for the mean	Lower limit	8,6302	
		Upper limit	9,2198	
	Average cut out at 5%		8,6346	
	Median		8,3700	
	Variance		7,368	
	Std. deviation		2,71436	
	Minimum		5,04	
	Maximum		22,00	
	Interval		16,96	
	Interquartile interval		2,58	
	Asymmetry		1,855	0,135
	Curtosis		4,208	0,268

Table 36 – Technical Test n 1 – Percentiles (s)

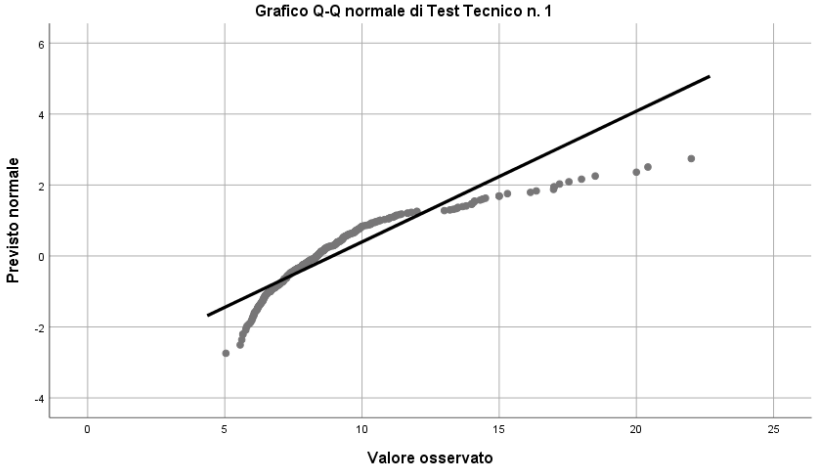
		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test Tecnico n. 1	6,0700	6,3760	7,1525	8,3700	9,7275	13,0200	14,7750
Cardini di Tukey	Test Tecnico n. 1			7,1550	8,3700	9,7250		

Table 37 – Technical Test n 1 – Normality tests

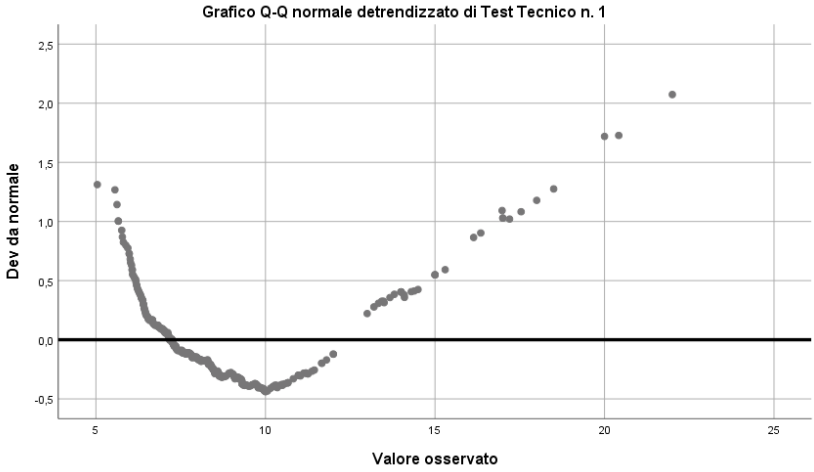
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test Tecnico n. 1	,148	328	,000	,833	328	,000



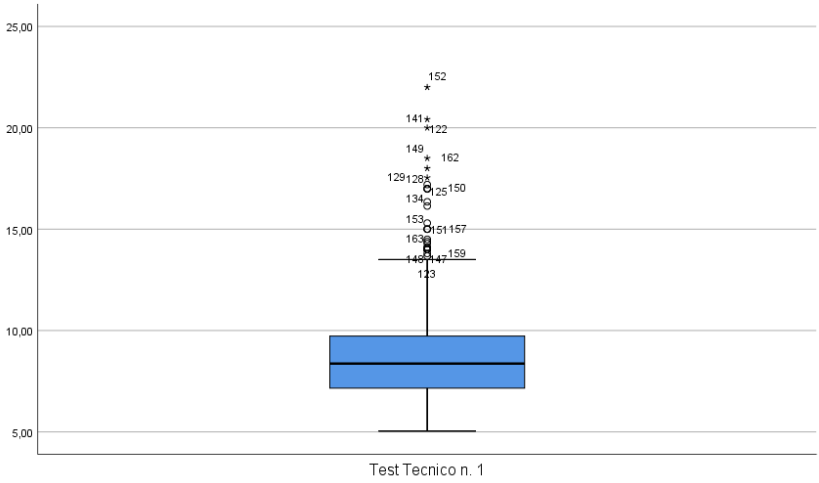
Graph 28 – Technical Test n 1 – Histogram



Graph 29 – Technical Test n 1 – Q-Q normal



Graph 30 – Technical Test n 1 – Q-Q de-trended normal graph



Graph 31 – Technical Test n 1 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 1)

Table 38 - Control vs Experimental group: descriptive statistics (Technical Test n 1)

Test Tecnico n. 1	Group	Mean	Std.Deviation	Standard error
	Controllo	8,034	1,565	0,158
	Sperimentale	10,259	3,847	0,358

Table 39 - Control vs Experimental group: independent test t (Technical Test n 1)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
									Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Inferiore	Superiore
Test Tecnico n. 1	Varianze uguali presunte	65,462	0,000	-5,334	210	0,000	-2,224	,417	-3,047	-1,402
	Varianze uguali non presunte			-5,670	156,027	0,000	-2,224	,392	-3,000	-1,449

2.2.1.1Comparative Analysis by Country – Technical Testing n. 1

Table 40 – Comparative analysis by country (Technical Testing n. 1): descriptive statistics and ANOVA

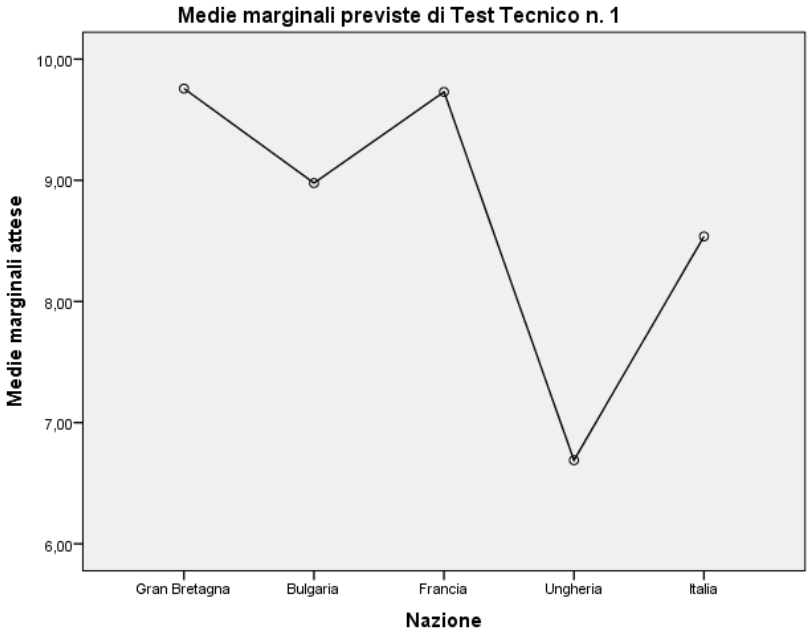
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	9,76	1,05	41,00
Bulgaria	8,98	1,06	70,00
Francia	9,73	3,71	81,00
Ungheria	6,69	0,69	76,00
Italia	8,54	1,23	47,00
Totale	8,65	2,38	315,00

Test degli effetti fra soggetti

Variabile dipendente: Test Tecnico n. 1

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	444,884[a]	4,000	111,221	25,972	0,000	0,251
Intercetta	22337,706	1,000	22337,706	5216,262	0,000	0,944
Nation	**444,884**	**4,000**	**111,221**	**25,972**	**0,000**	**0,251**
Errore	1327,519	310,000	4,282			
Totale	25366,755	315,000				
Totale corretto	1772,403	314,000				

a. R quadrato = ,251 (R quadrato corretto = ,241)



Graph 32 – Technical Testing n. 1 – ANOVA

2.2.2. Technical Test n 1 - second testing (2019)

The recorded values are expressed in seconds (s)

Table 41 – Technical Test n 1 – Descriptive Statistics (s)

			Statistica	Errore std.
Technical Test 1_2	Mean		8,0611	0,10786
	95% confidence interval for the mean	Lower limit	7,8485	
		Upper limit	8,2738	
	Average cut out at 5%		8,0232	
	Median		8,0950	
	Variance		2,396	
	Std. deviation		1,54802	
	Minimum		5,05	
	Maximum		12,65	
	Interval		7,60	
	Interquartile interval		2,21	
	Asymmetry		0,278	0,169
	Curtosis		-0,403	0,337

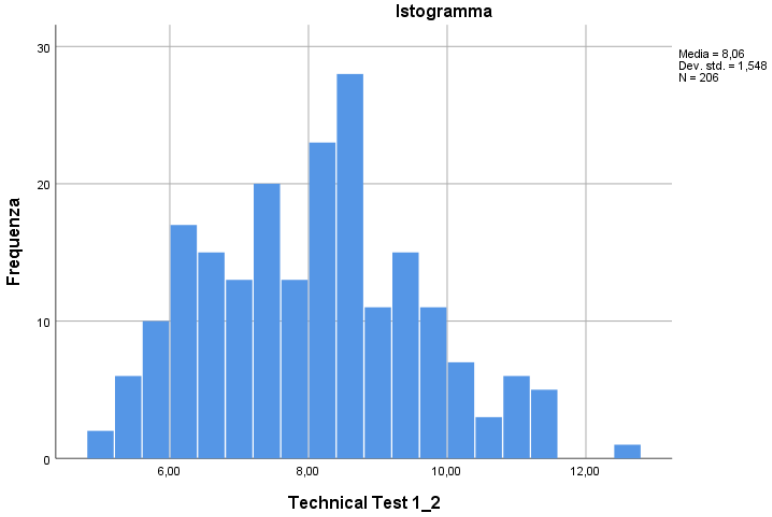
Table 42 – Technical Test n 1 – Percentiles (s)

		5	10	25	50	75	90	95
Media pesata (definizione 1)	Technical Test 1_2	5,6975	6,0100	6,9075	8,0950	9,1150	10,0900	11,0090
Cardini di Tukey	Technical Test 1_2			6,9100	8,0950	9,1000		

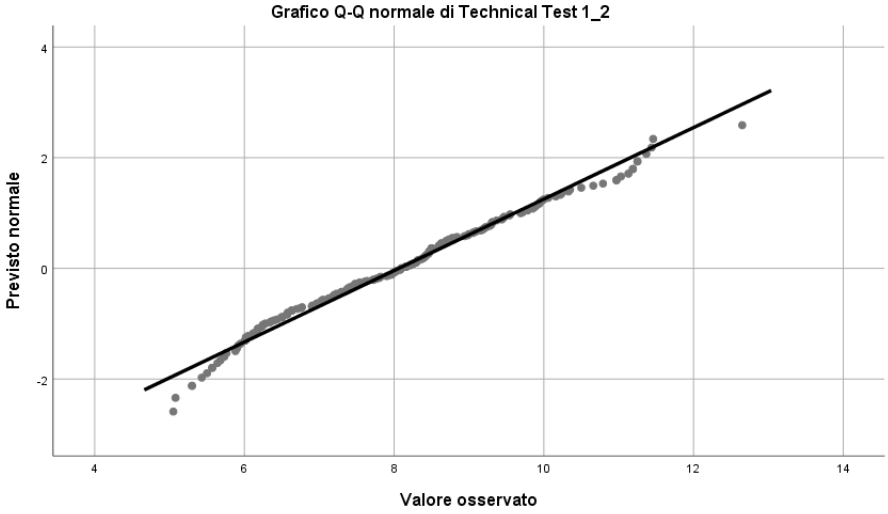
Table 43 – Technical Test n 1 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Technical Test 1_2	,051	206	,200*	,984	206	,019

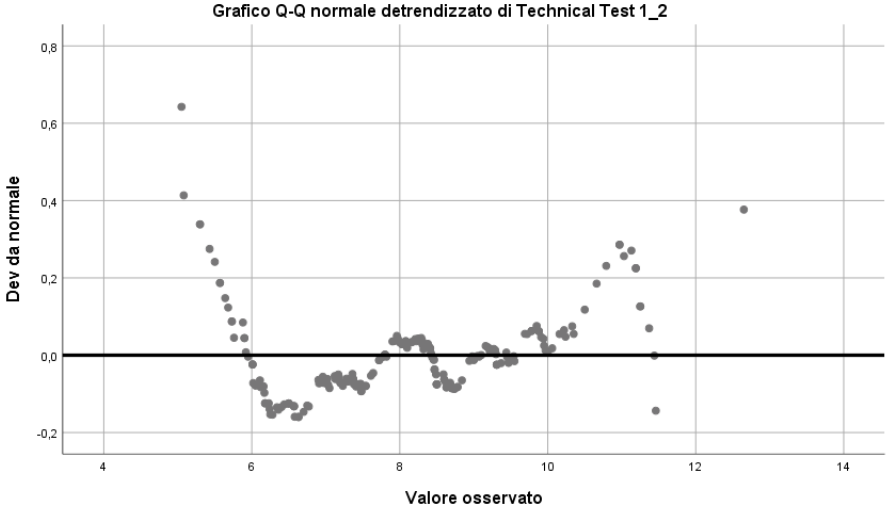
*. Questo è un limite inferiore della significatività effettiva.
a. Correzione di significatività di Lilliefors



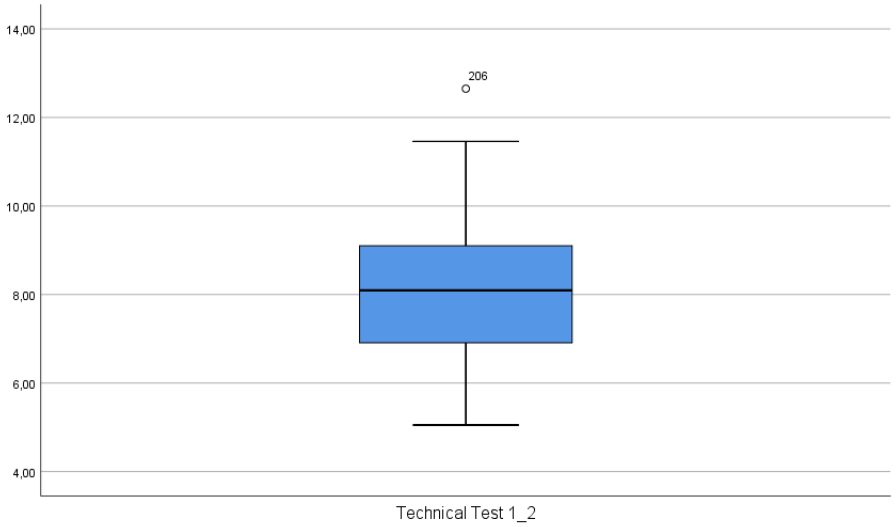
Graph 33 – Technical Test n 1 – Histogram



Graph 34 – Technical Test n 1 – Q-Q normal



Graph 35 – Technical Test n 1 – Q-Q de-trended normal graph



Graph 36 – Technical Test n 1 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 1)

Table 44 - Control vs Experimental group: descriptive statistics (Technical Test n 1)

Technical Test 1_2	Group	Mean	Std.Deviation	Standard error
	Control	7,6490	1,37983	,13798
	Experimental	8,4499	1,60286	,15568

Table 45 - Control vs Experimental group: independent test t (Technical Test n 1)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Technical Test 1_2	Varianze uguali presunte	1,663	0,199	-3,833	204	0,000	-0,80091	0,20894	-1,21286	-0,38895
	Varianze uguali non presunte			-3,850	202,334	0,000	-0,80091	0,20803	-1,21109	-0,39072

2.2.3 Technical Test n 2 - first testing (2017)

The recorded values are expressed in seconds (s)

Table 46 – Technical Test n 2 – Descriptive Statistics (s)

			Statistica	Errore std.
Test Tecnico n. 2	Mean		12,7048	0,17060
	95% confidence interval for the mean	Lower limit	12,3692	
		Upper limit	13,0405	
	Average cut out at 5%		12,8562	
	Median		12,5700	
	Variance		9,400	
	Std. deviation		3,06602	
	Minimum		0,00	
	Maximum		24,80	
	Interval		24,80	
	Interquartile interval		1,94	
	Asymmetry		-1,228	0,136
	Curtosis		7,257	0,271

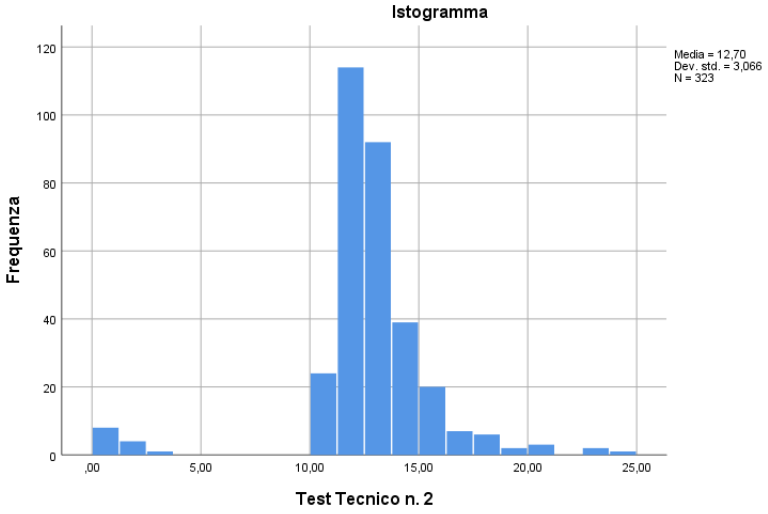
Table 47 – Technical Test n 2 – Percentiles (s)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test Tecnico n. 2	10,6340	11,1500	11,8000	12,5700	13,7400	15,4060	17,0760
Cardini di Tukey	Test Tecnico n. 2			11,8050	12,5700	13,7400		

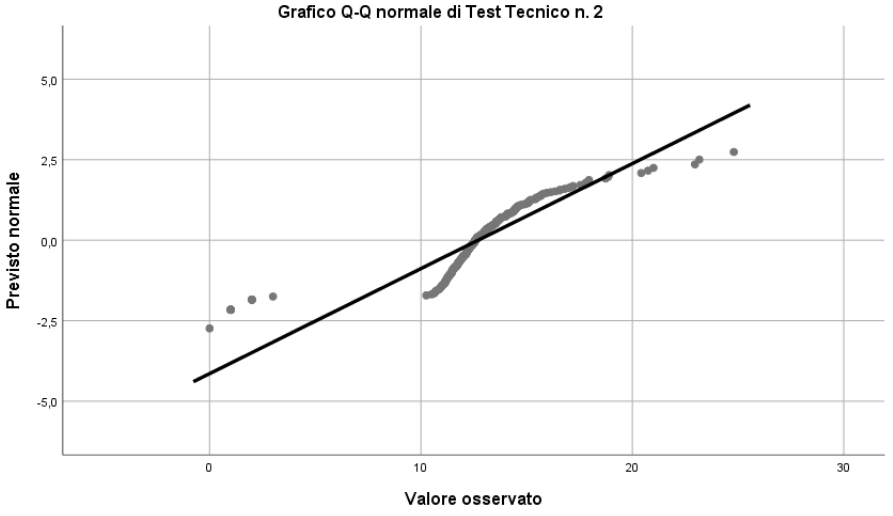
Table 48 – Technical Test n 2 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test Tecnico n. 2	0,216	323	0,000	,763	323	0,000

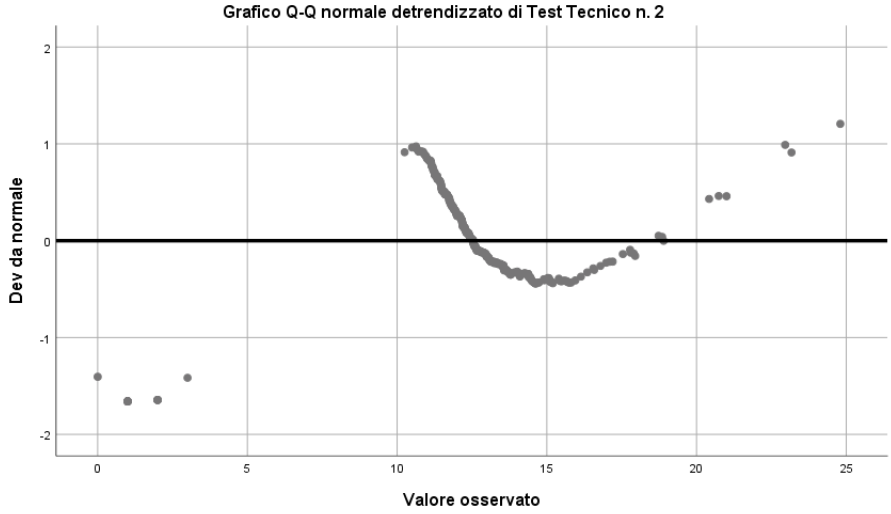
a. Correzione di significatività di Lilliefors



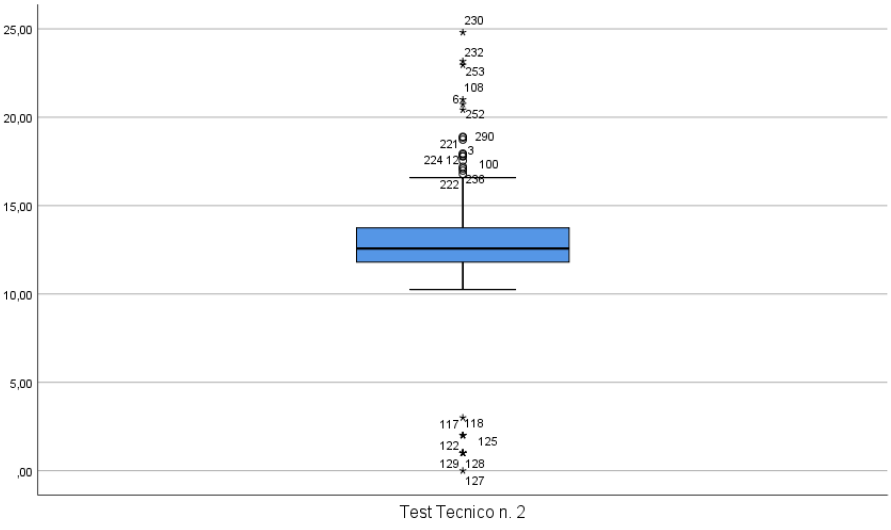
Graph 37 – Technical Test n 2 – Histogram



Graph 38 – Technical Test n 2 – Q-Q normal



Graph 39 – Technical Test n 2 – Q-Q de-trended normal graph



Graph 40 – Technical Test n 2 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 2)

Table 49 - Control vs Experimental group: descriptive statistics (Technical Test n 1)

Test Tecnico n. 2	Group	Mean	Std.Deviation	Standard error
	Controllo	12,991	1,605	0,168
	Sperimentale	11,597	4,021	0,373

Table 50 - Control vs Experimental group: independent test t (Technical Test n 2)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Test Tecnico n. 2	Varianze uguali presunte	15,659	0,000	3,117	205	0,002	1,394	0,447	0,512	2,276
	Varianze uguali non presunte			3,405	158,129	0,001	1,394	0,409	0,585	2,203

2.2.3.1Comparative Analysis by Country – Technical Testing n. 2

Table 51 – Comparative analysis by country (Technical Testing n. 2): descriptive statistics and ANOVA

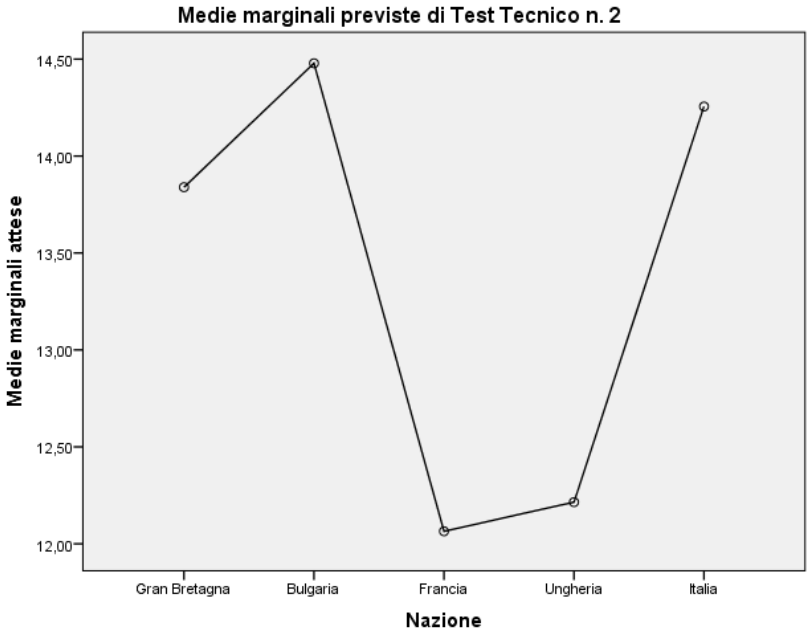
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	13,84	1,75	40,00
Bulgaria	14,48	2,76	70,00
Francia	12,06	0,93	81,00
Ungheria	12,22	0,97	76,00
Italia	14,26	1,84	43,00
Totale	13,18	2,04	310,00

Test degli effetti fra soggetti

Variabile dipendente: Test Tecnico n. 2

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	356,796[a]	4,000	89,199	29,339	0,000	0,278
Intercetta	50762,494	1,000	50762,494	16696,400	0,000	0,982
Nation	**356,796**	**4,000**	**89,199**	**29,339**	**0,000**	**0,278**
Errore	927,299	305,000	3,040			
Totale	55131,249	310,000				
Totale corretto	1284,095	309,000				

a. R quadrato = ,278 (R quadrato corretto = ,268)



Graph 41 – Technical Testing n. 2 – ANOVA

2.2.4Technical Test n 2 - second testing (2019)

The recorded values are expressed in seconds (s)

Table 52 – Technical Test n 2 – Descriptive Statistics (s)

			Statistica	Errore std.
Technical Test 2_2	Mean		13,6175	0,16061
	95% confidence interval for the mean	Lower limit	13,3009	
		Upper limit	13,9342	
	Average cut out at 5%		13,3926	
	Median		13,0950	
	Variance		5,263	
	Std. deviation		2,29402	
	Minimum		10,63	
	Maximum		24,80	
	Interval		14,17	
	Interquartile interval		2,50	
	Asymmetry		1,809	0,170
	Curtosis		4,936	0,339

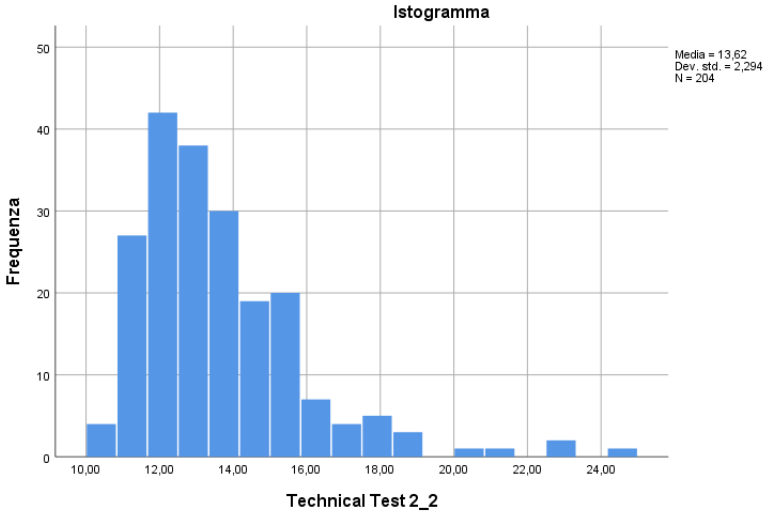
Table 53 – Technical Test n 2 – Percentiles (s)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Technical Test 2_2	10,9525	11,2750	12,0725	13,0950	14,5700	16,4450	17,9150
Cardini di Tukey	Technical Test 2_2			12,0750	13,0950	14,5700		

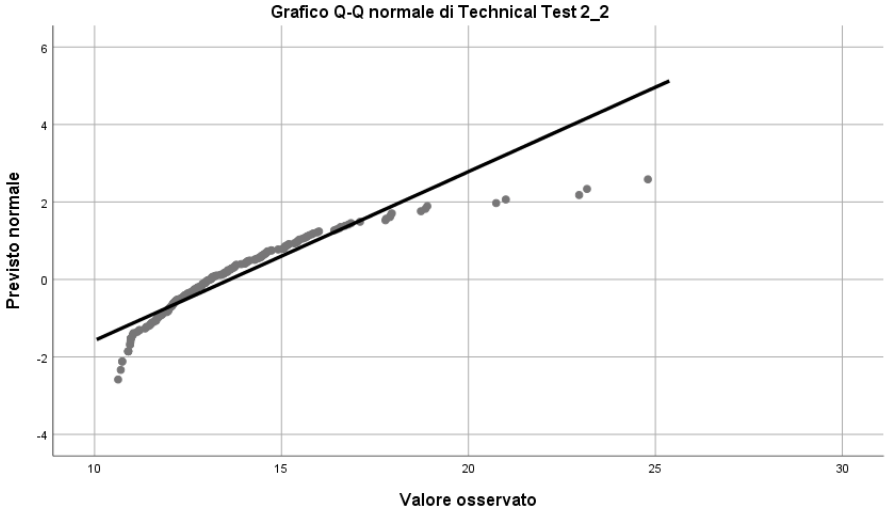
Table 54 – Technical Test n 2 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Technical Test 2_2	,122	204	,000	,861	204	,000

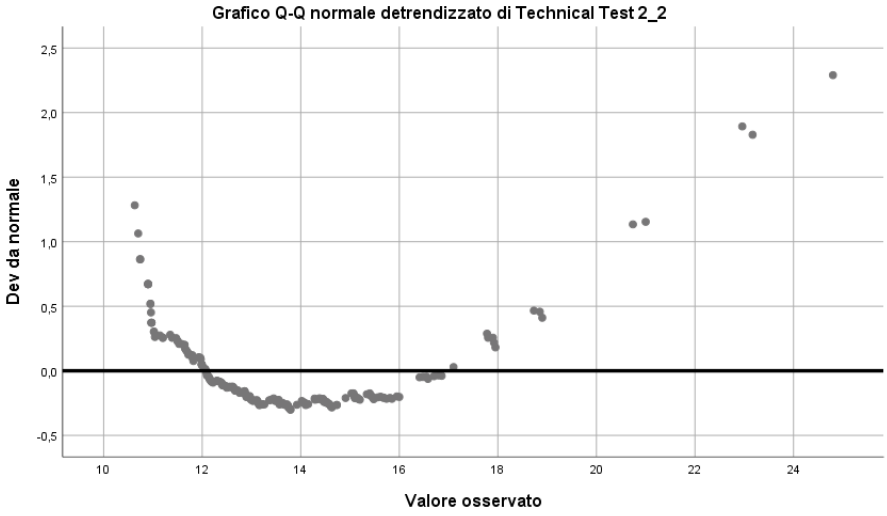
a. Correzione di significatività di Lilliefors



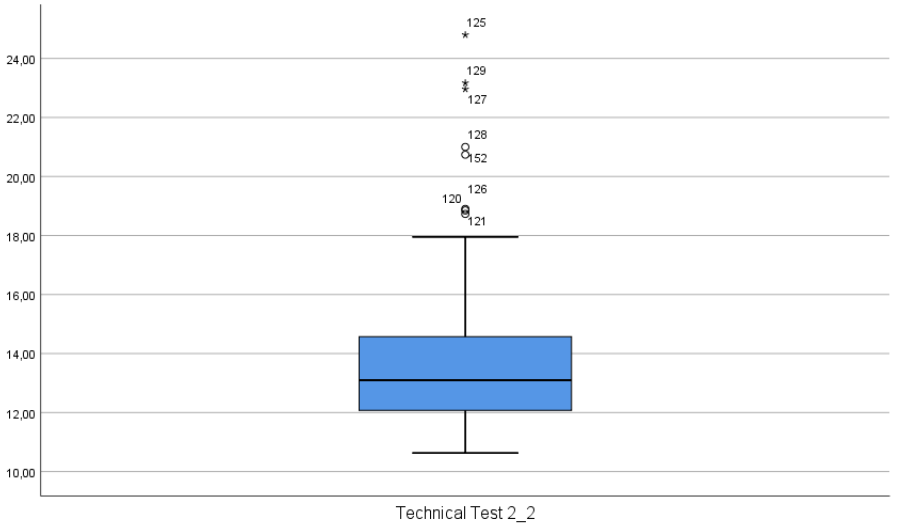
Graph 42 – Technical Test n 2 – Histogram



Graph 43 – Technical Test n 2 – Q-Q normal



Graph 44 – Technical Test n 2 – Q-Q de-trended normal graph



Graph 45 – Technical Test n 2 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 2)

Table 55 - Control vs Experimental group: descriptive statistics (Technical Test n 1)

Technical Test 2_2	Group	Mean	Std.Deviation	Standard error
	Control	13,7011	2,59040	0,26577
	Experimental	13,5448	2,00992	0,19252

Table 56 - Control vs Experimental group: independent test t (Technical Test n 2)

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
									Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Inferiore	Superiore
Technical Test 2_2	Varianze uguali presunte	3,557	,061	,484	202	,629	,15628	,32259	-,47980	,79237
	Varianze uguali non presunte			,476	176,283	,635	,15628	,32817	-,49137	,80393

2.2.5 Technical Test n 3 - first testing (2017)

The recorded values are expressed in points (p), accorded as the right passes were achieved

Table 57 – Technical Test n 3 – Descriptive Statistics (p)

			Statistica	Errore std.
Test Tecnico n. 3	Mean		2,6894	0,11279
	95% confidence interval for the mean	Lower limit	2,4675	
		Upper limit	2,9113	
	Average cut out at 5%		2,5169	
	Median		2,0000	
	Variance		4,096	
	Std. deviation		2,02396	
	Minimum		,00	
	Maximum		14,00	
	Interval		14,00	
	Interquartile interval		3,00	
	Asymmetry		1,772	0,136
	Curtosis		5,610	0,271

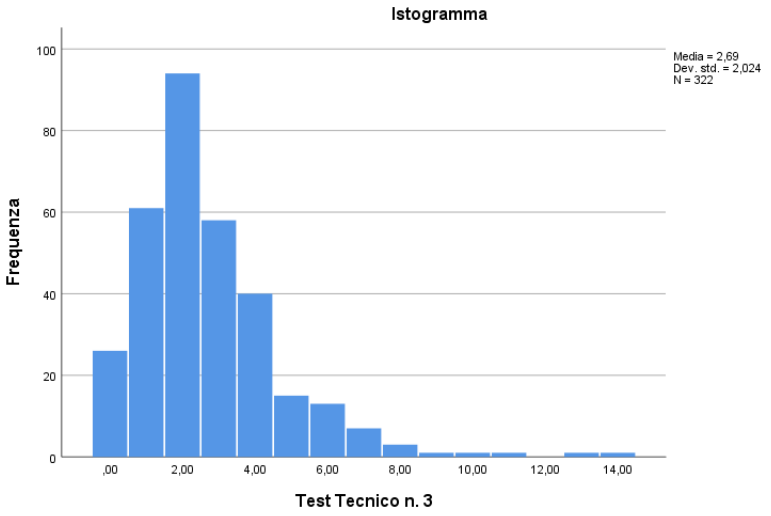
Table 58 – Technical Test n 3 – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test Tecnico n. 3	,0000	1,0000	1,0000	2,0000	4,0000	5,0000	6,0000
Cardini di Tukey	Test Tecnico n. 3			1,0000	2,0000	4,0000		

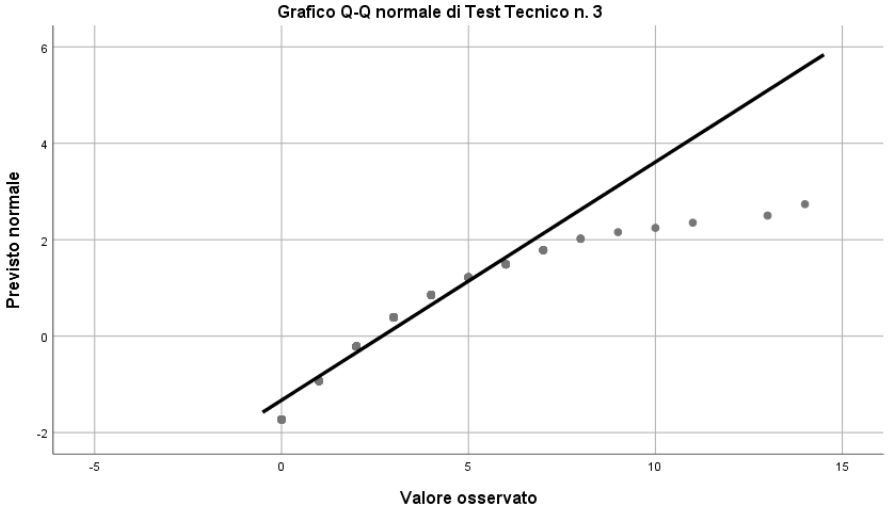
Table 59 – Technical Test n 3 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test Tecnico n. 3	0,195	322	0,000	0,855	322	0,000

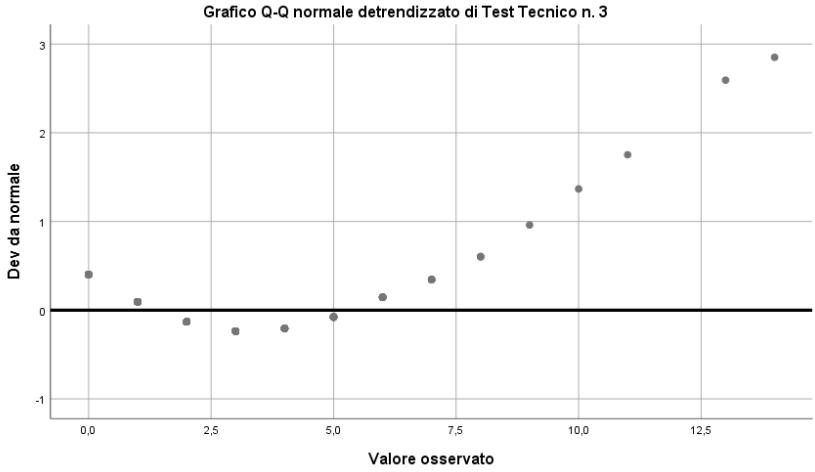
a. Correzione di significatività di Lilliefors



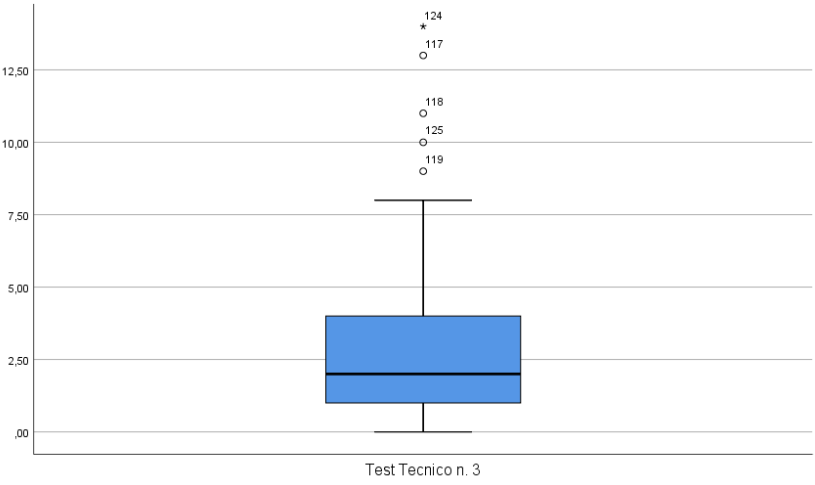
Graph 46 – Technical Test n 3 – Histogram



Graph 47 – Technical Test n 3 – Q-Q normal



Graph 48 – Technical Test n 3 – Q-Q de-trended normal graph



Graph 49 – Technical Test n 3 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 3)

Table 60 - Control vs Experimental group: descriptive statistics (Technical Test n 3)

Test Tecnico n. 3	Group	Mean	Std.Deviation	Standard error
	Controllo	2,5056	1,43118	0,15170
	Sperimentale	3,0342	2,71944	0,25141

Table 61 - Control vs Experimental group: independent test t (Technical Test n 3)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
									Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Inferiore	Superiore
Test Tecnico n. 3	Varianze uguali presunte	19,576	0,000	-1,666	204	0,097	-,52857	0,31729	-1,15415	0,09701
	Varianze uguali non presunte			-1,800	183,741	0,073	-,52857	0,29364	-1,10790	0,05076

2.2.5.1 Comparative Analysis by Country – Technical Testing n. 3

Table 62 – Comparative analysis by country (Technical Testing n. 3): descriptive statistics and ANOVA

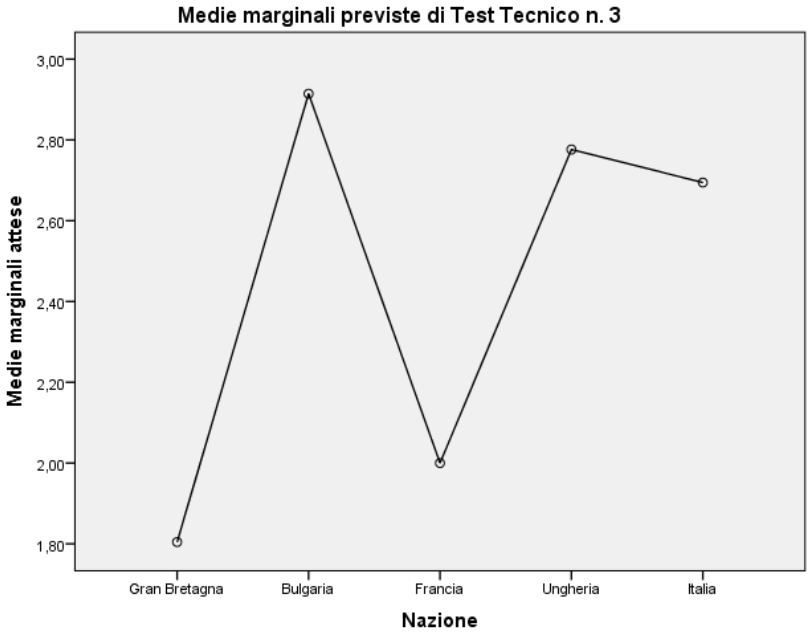
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	1,80	0,98	46,00
Bulgaria	2,91	1,58	70,00
Francia	2,00	1,43	81,00
Ungheria	2,78	1,60	76,00
Italia	2,69	1,97	36,00
Totale	2,45	1,58	309,00

Test degli effetti fra soggetti

Variabile dipendente: Test Tecnico n. 3

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	60,911[a]	4,000	15,228	6,561	0,000	0,079
Intercetta	1663,729	1,000	1663,729	716,839	0,000	0,702
Nation	**60,911**	**4,000**	**15,228**	**6,561**	**0,000**	**0,079**
Errore	705,561	304,000	2,321			
Totale	2621,000	309,000				
Totale corretto	766,472	308,000				

a. R quadrato = ,079 (R quadrato corretto = ,067)



Graph 50 – Technical Testing n. 2 – ANOVA

2.2.6 Technical Test n 3 - second testing (2019)

The recorded values are expressed in points (p), accorded as the right passes were achieved

Table 63 – Technical Test n 3 – Descriptive Statistics (p)

			Statistica	Errore std.
Technical Test 3_2	Mean		2,5676	,11743
	95% confidence interval for the mean	Lower limit	2,3359	
		Upper limit	2,7993	
	Average cut out at 5%		2,5030	
	Median		2,0000	
	Variance		2,551	
	Std. deviation		1,59722	
	Minimum		,00	
	Maximum		8,00	
	Interval		8,00	
	Interquartile interval		3,00	
	Asymmetry		,555	,179
	Curtosis		,232	,355

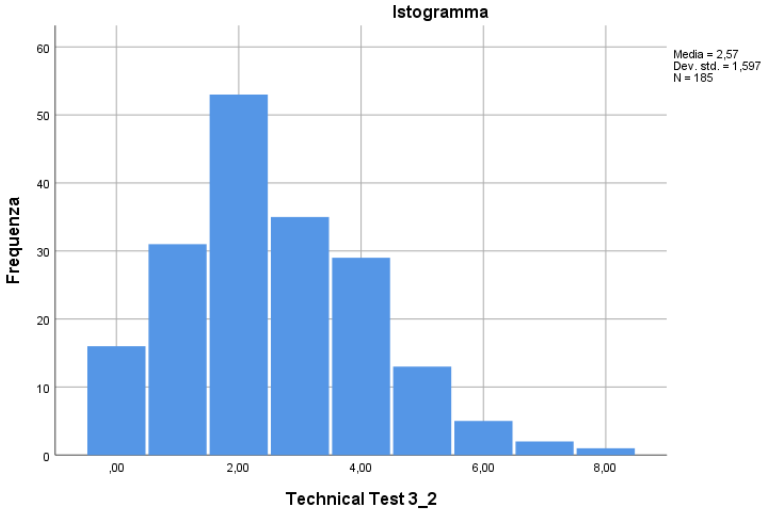
Table 64 – Technical Test n 3 – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Technical Test 3_2	,0000	1,0000	1,0000	2,0000	4,0000	5,0000	5,0000
Cardini di Tukey	Technical Test 3_2			1,0000	2,0000	4,0000		

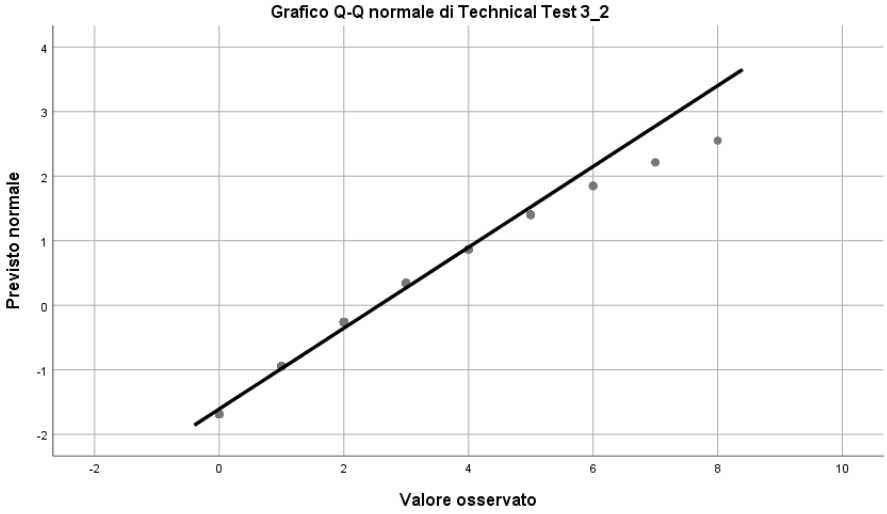
Table 65 – Technical Test n 3 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Technical Test 3_2	,179	185	,000	,942	185	,000

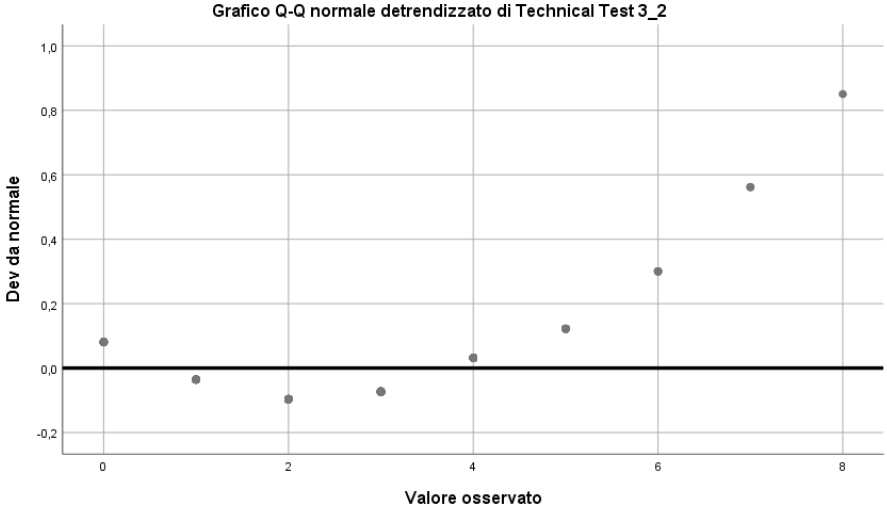
a. Correzione di significatività di Lilliefors



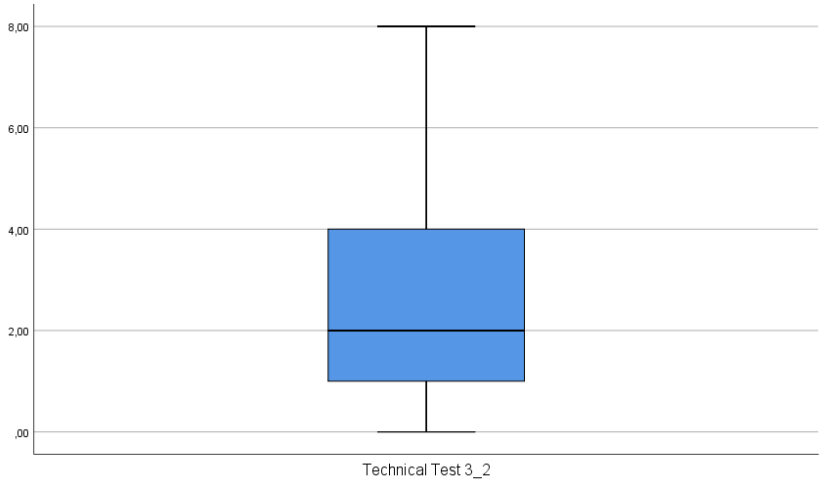
Graph 51 – Technical Test n 3 – Histogram



Graph 52 – Technical Test n 3 – Q-Q normal



Graph 53 – Technical Test n 3 – Q-Q de-trended normal graph



Graph 54 – Technical Test n 3 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 3)

Table 66 - Control vs Experimental group: descriptive statistics (Technical Test n 3)

Technical Test 3_2	Group	Mean	Std.Deviation	Standard error
	Control	2,8161	1,55166	,16636
	Experimental	2,3469	1,61246	,16288

Table 67 - Control vs Experimental group: independent test t (Technical Test n 3)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Technical Test 3_2	Varianze uguali presunte	,369	,544	2,010	183	0,046	,46915	,23336	,00874	,92957
	Varianze uguali non presunte			2,015	181,797	0,045	,46915	,23282	,00978	,92853

2.2.7 Technical Test n 4 - first testing (2017)

The recorded values are expressed in points (p), accorded as the right targets were achieved

Table 68 – Technical Test n 4 – Descriptive Statistics (p)

			Statistica	Errore std.
Test Tecnico n. 4	Mean		11,8780	0,26322
	95% confidence interval for the mean	Lower limit	11,3602	
		Upper limit	12,3959	
	Average cut out at 5%		11,8591	
	Median		12,0000	
	Variance		22,725	
	Std. deviation		4,76709	
	Minimum		0,00	
	Maximum		25,00	
	Interval		25,00	
	Interquartile interval		6,00	
	Asymmetry		0,035	0,135
	Curtosis		-0,083	0,268

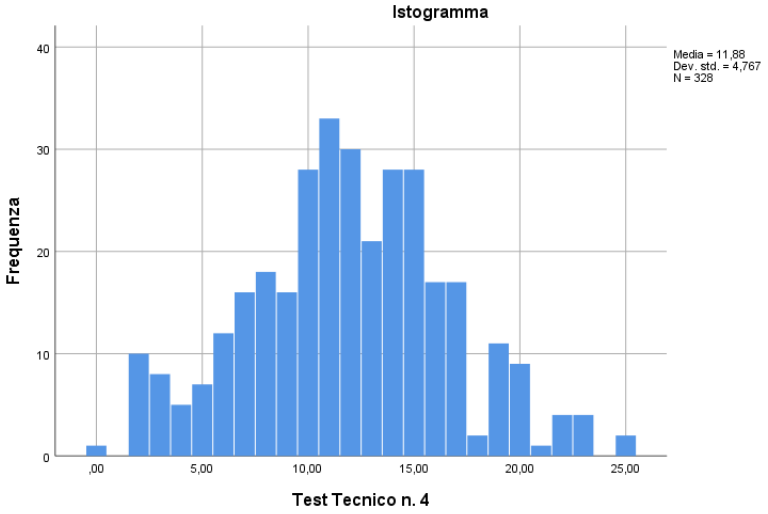
Table 69 – Technical Test n 4 – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Test Tecnico n. 4	3,0000	6,0000	9,0000	12,0000	15,0000	18,0000	20,0000
Cardini di Tukey	Test Tecnico n. 4			9,0000	12,0000	15,0000		

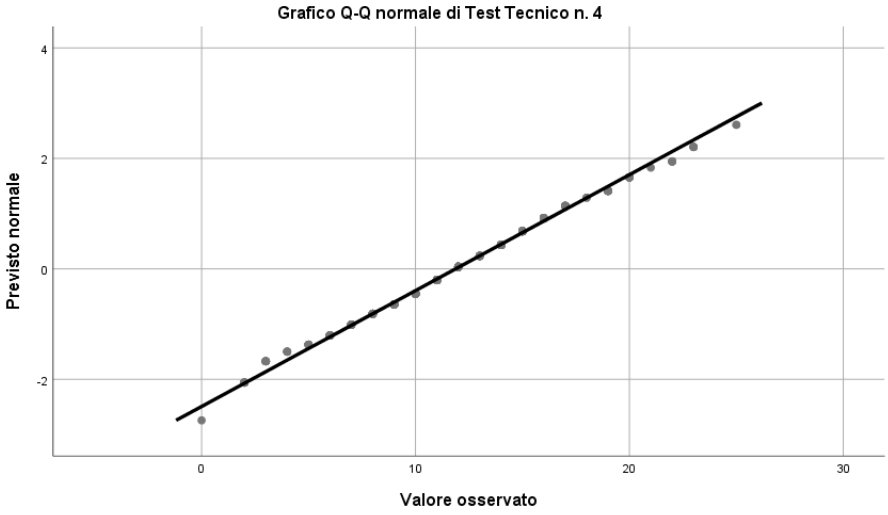
Table 70 – Technical Test n 4 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Test Tecnico n. 4	0,063	328	0,003	0,990	328	0,022

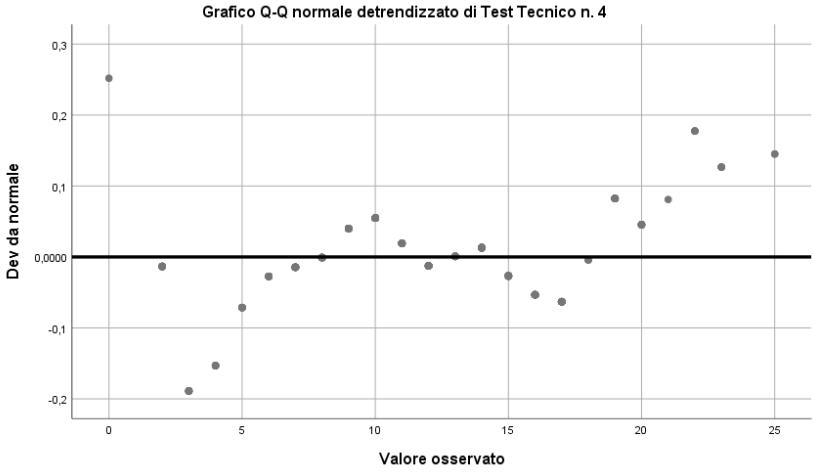
a. Correzione di significatività di Lilliefors



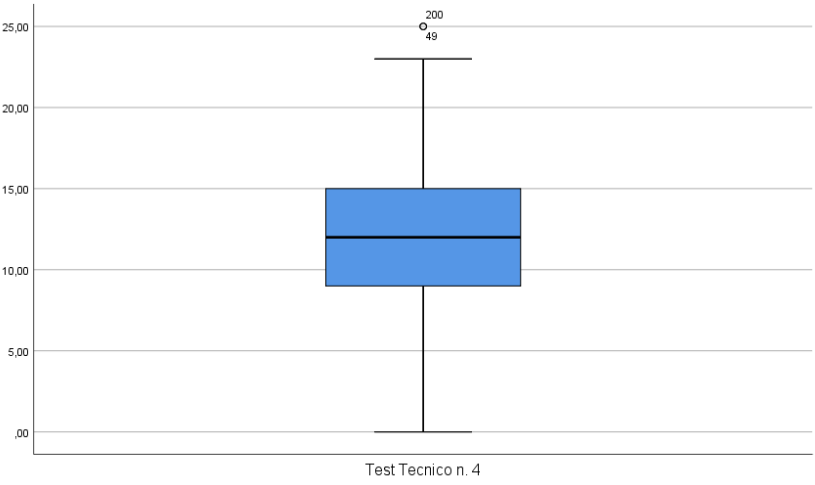
Graph 55 – Technical Test n 4 – Histogram



Graph 56 – Technical Test n 4 – Q-Q normal



Graph 57 – Technical Test n 4 – Q-Q de-trended normal graph



Graph 58 – Technical Test n 4 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 4)

Table 71 - Control vs Experimental group: descriptive statistics (Technical Test n 4)

Test Tecnico n. 4	Group	Mean	Std.Deviation	Standard error
	Controllo	11,5579	4,21425	0,43237
	Sperimentale	11,4359	5,65592	0,52289

Table 72 - Control vs Experimental group: independent test t (Technical Test n 4)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Test Tecnico n. 4	Varianze uguali presunte	11,382	0,001	0,175	210	0,862	0,12200	0,69904	-1,25604	1,50003
	Varianze uguali non presunte			0,180	208,545	0,857	0,12200	0,67850	-1,21560	1,45959

2.2.7.1 Comparative Analysis by Country – Technical Testing n. 4

Table 73 – Comparative analysis by country (Technical Testing n. 4): descriptive statistics and ANOVA

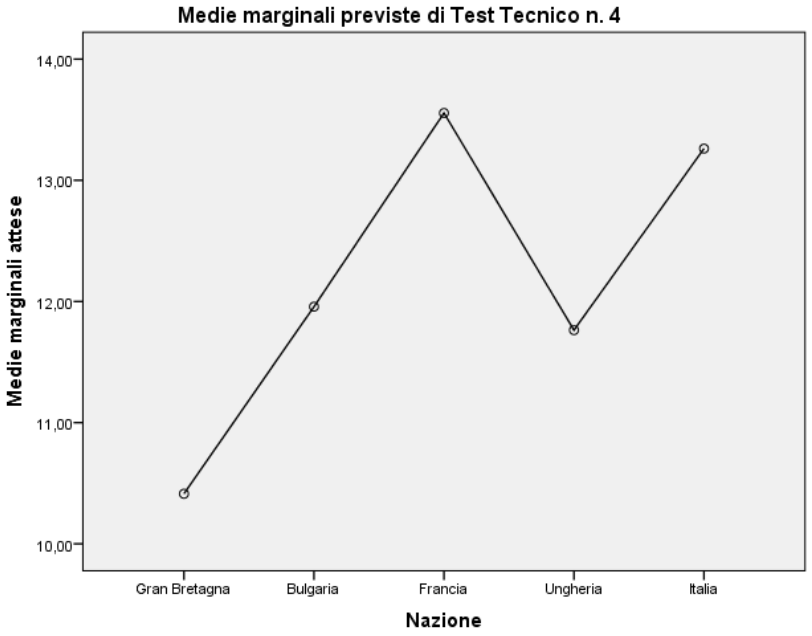
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	10,41	4,19	46,00
Bulgaria	11,96	3,85	70,00
Francia	13,56	4,44	81,00
Ungheria	11,76	3,90	76,00
Italia	13,26	5,67	42,00
Totale	12,27	4,45	315,00

Test degli effetti fra soggetti

Variabile dipendente: Test Tecnico n. 4

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	360,184[a]	4,000	90,046	4,773	0,001	0,058
Intercetta	43532,812	1,000	43532,812	2307,703	0,000	0,882
Nation	**360,184**	**4,000**	**90,046**	**4,773**	**0,001**	**0,058**
Errore	5847,879	310,000	18,864			
Totale	53631,000	315,000				
Totale corretto	6208,063	314,000				

a. R quadrato = ,058 (R quadrato corretto = ,046)



Graph 59 – Technical Testing n. 4 – ANOVA

2.2.8 Technical Test n 4 - second testing (2019)

The recorded values are expressed in points (p), accorded as the right targets were achieved

Table 74 – Technical Test n 4 – Descriptive Statistics (p)

			Statistica	Errore std.
Technical Test 4_2	Mean		12,1443	,34327
	95% confidence interval for the mean	Lower limit	11,4674	
		Upper limit	12,8212	
	Average cut out at 5%		12,0495	
	Median		12,0000	
	Variance		23,684	
	Std. deviation		4,86663	
	Minimum		,00	
	Maximum		25,00	
	Interval		25,00	
	Interquartile interval		6,00	
	Asymmetry		,267	,172
	Curtosis		-,058	,341

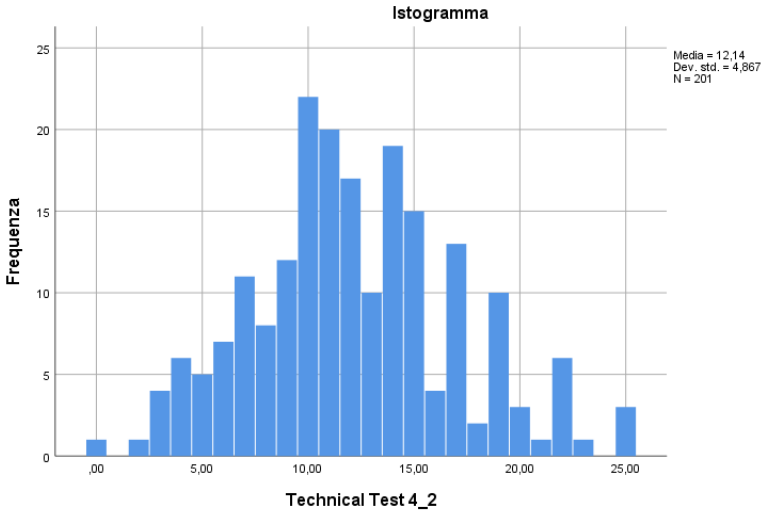
Table 75 – Technical Test n 4 – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Technical Test 4_2	4,0000	6,0000	9,0000	12,0000	15,0000	19,0000	21,9000
Cardini di Tukey	Technical Test 4_2			9,0000	12,0000	15,0000		

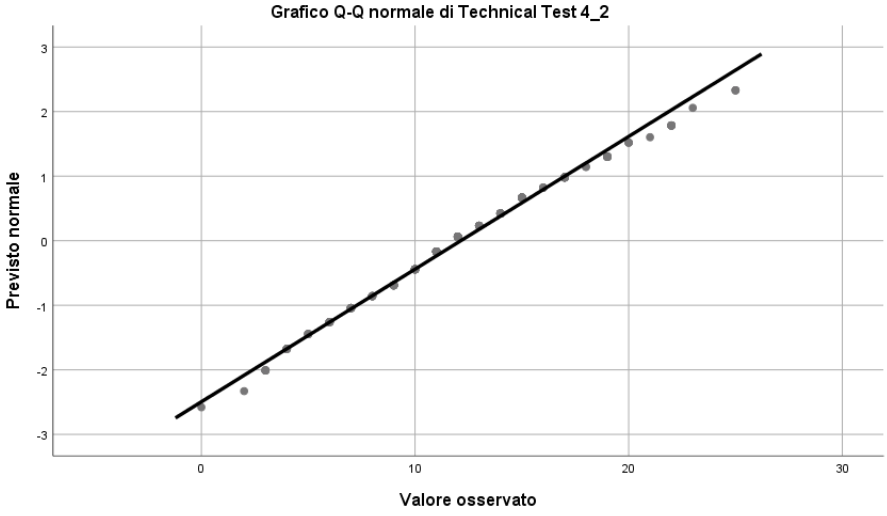
Table 76 – Technical Test n 4 – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Technical Test 4_2	,079	201	,004	,987	201	,058

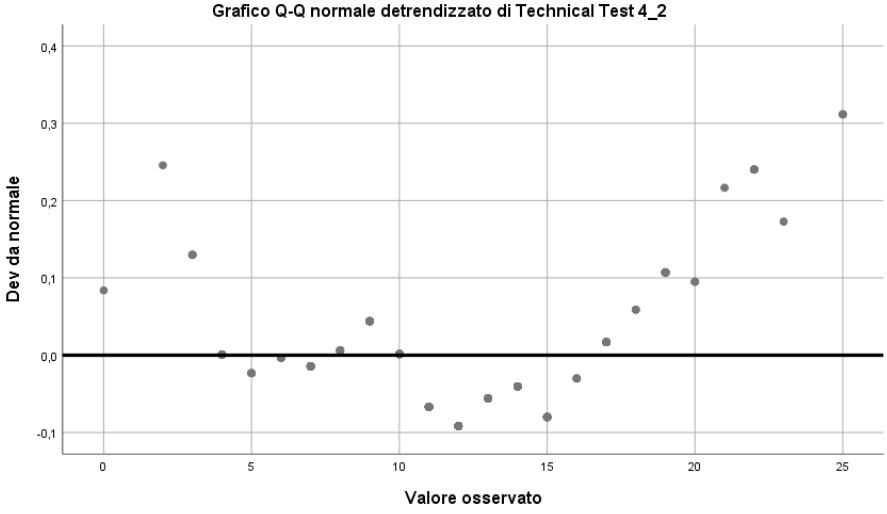
a. Correzione di significatività di Lilliefors



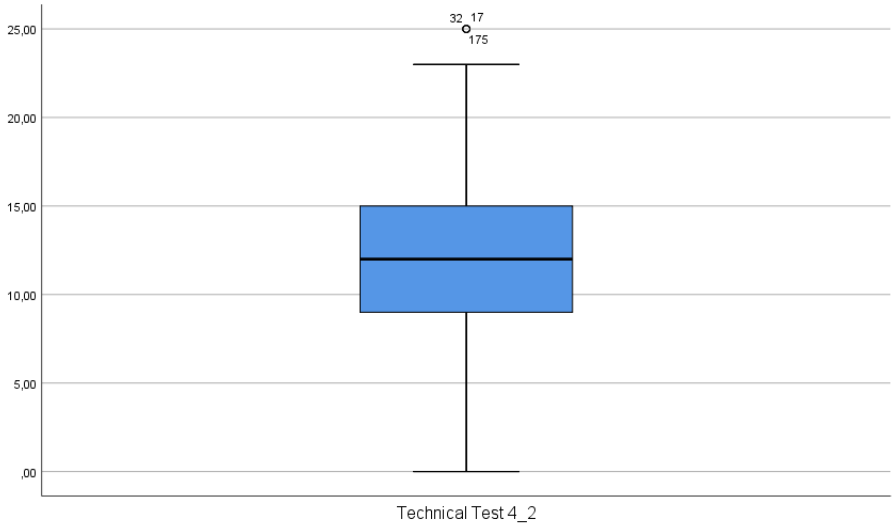
Graph 60 – Technical Test n 4 – Histogram



Graph 61 – Technical Test n 4 – Q-Q normal



Graph 62 – Technical Test n 4 – Q-Q de-trended normal graph



Graph 63 – Technical Test n 4 – Box Chart

Independent Test t: Control vs Experimental group (technical test n. 4, second testing)

Table 77 - Control vs Experimental group: descriptive statistics (Technical Test n 4)

Technical Test 4_2	Group	Mean	Std.Deviation	Standard error
	Control	12,6344	5,17054	,53616
	Experimental	11,7222	4,57100	,43985

Table 78 - Control vs Experimental group: independent test t (Technical Test n 4)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Technical Test 4_2	Varianze uguali presunte	1,080	,300	1,328	199	0,186	,91219	,68714	-,44283	2,26720
	Varianze uguali non presunte			1,315	185,328	0,190	,91219	,69349	-,45597	2,28034

2.2.9 Global Technical Evaluation – first assessment (2017)

The recorded values are expressed in points (p), according to the assessment performed by the coaches (1-5)

Table 79 – Global Technical Evaluation– Descriptive Statistics (p)

			Statistica	Errore std.
Global Technical Evaluation	Mean		3,4021	0,07247
	95% confidence interval for the mean	Lower limit	3,2591	
		Upper limit	3,5450	
	Average cut out at 5%		3,4255	
	Median		3,0000	
	Variance		1,019	
	Std. deviation		1,00938	
	Minimum		1,00	
	Maximum		5,00	
	Interval		4,00	
	Interquartile interval		1,00	
	Asymmetry		-0,203	0,175
	Curtosis		-0,451	0,347

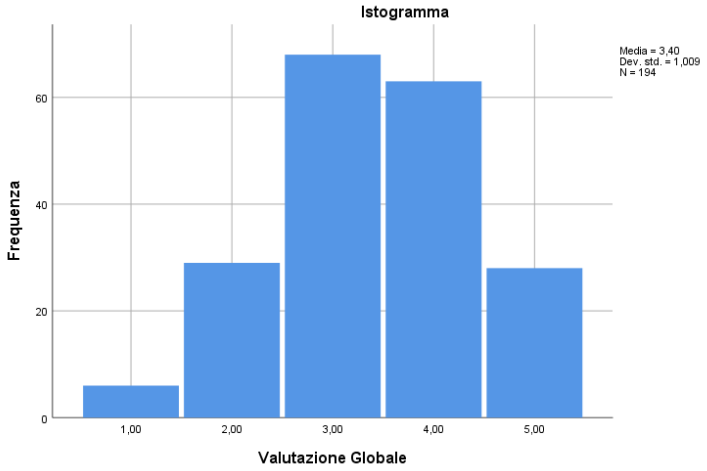
Table 80 – Global Technical Evaluation – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Valutazione Globale	2,0000	2,0000	3,0000	3,0000	4,0000	5,0000	5,0000
Cardini di Tukey	Valutazione Globale			3,0000	3,0000	4,0000		

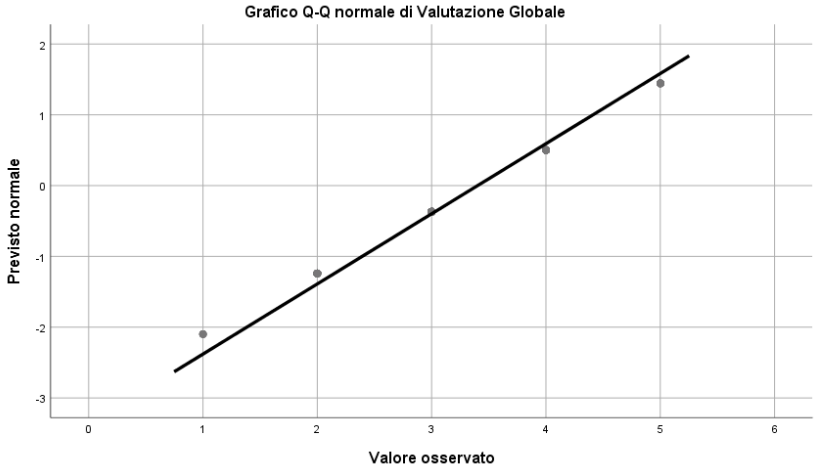
Table 81 – Global Technical Evaluation – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Valutazione Globale	0,192	194	0,000	0,904	194	0,000

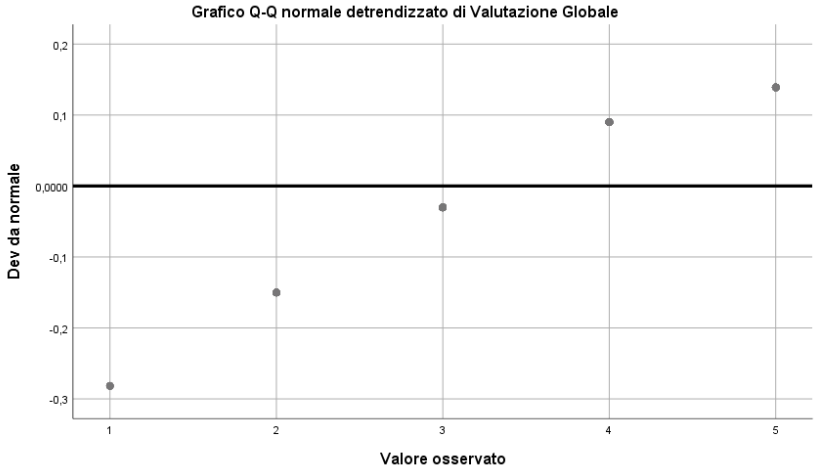
a. Correzione di significatività di Lilliefors



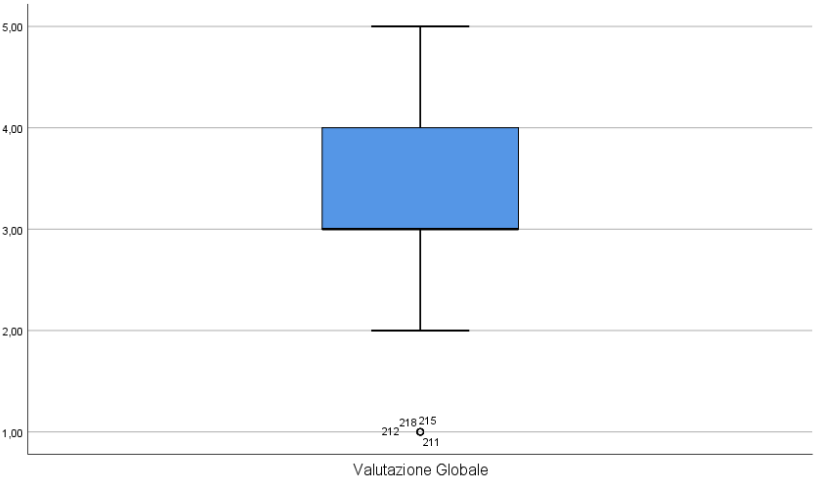
Graph 64 – Global Technical Evaluation – Histogram



Graph 65 – Global Technical Evaluation – Q-Q normal



Graph 66 – Global Technical Evaluation – Q-Q de-trended normal graph



Graph 67 – Global Technical Evaluation – Box Chart

Independent Test t: Control vs Experimental group (Global Technical Evaluation)

Table 82 - Control vs Experimental group: descriptive statistics (Global Technical Evaluation)

Valutazione Globale	Group	Mean	Std.Deviation	Standard error
	Controllo	3,2909	,91637	,12356
	Sperimentale	2,8841	1,03663	,12480

Table 83 - Control vs Experimental group: independent test t (Global Technical Evaluation)

		Test di Levene per l'eguaglianza delle *varianze*		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Valutazione Globale	Varianze uguali presunte	,073	0,787	2,285	122	0,024	0,40685	0,17809	0,05431	0,75939
	Varianze uguali non presunte			2,317	120,656	0,022	0,40685	0,17562	0,05916	0,75454

2.2.9.1 Comparative Analysis by Country – Global Technical Evaluation

Table 84 – Comparative analysis by country (Global Technical Evaluation): descriptive statistics and ANOVA

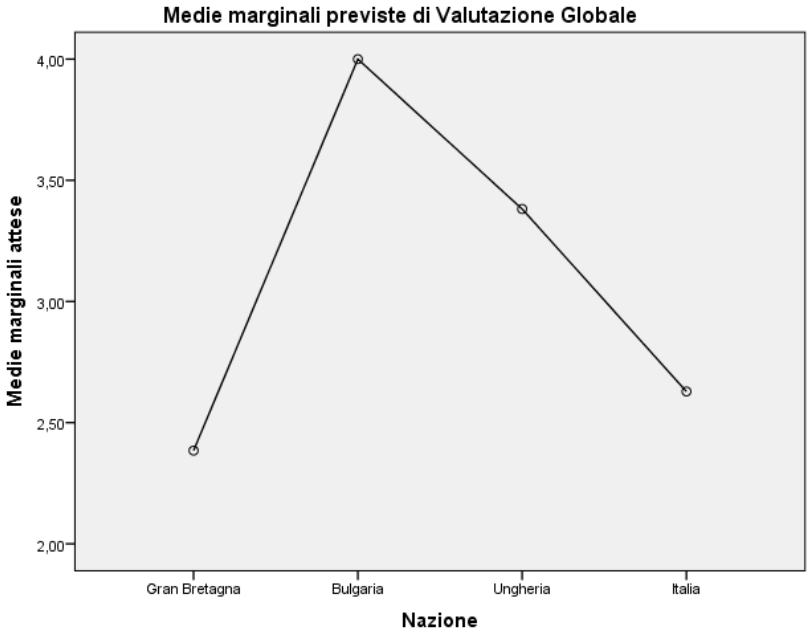
Nazione	Media	Deviazione standard Variabile	N
Gran Bretagna	2,38	0,51	13,00
Bulgaria	4,00	0,70	70,00
Ungheria	3,38	0,85	76,00
Italia	2,63	1,17	35,00
Totale	3,40	1,01	194,00

Test degli effetti fra soggetti

Variabile dipendente: Valutazione Globale

Sorgente	Somma dei quadrati Tipo III	df	Media dei quadrati	F	Sig.	Eta quadrato parziale
Modello corretto	59,457[a]	3,000	19,819	27,449	0,000	0,302
Intercetta	1155,652	1,000	1155,652	1600,596	0,000	0,894
Nation	**59,457**	**3,000**	**19,819**	**27,449**	**0,000**	**0,302**
Errore	137,183	190,000	0,722			
Totale	2442,000	194,000				
Totale corretto	196,639	193,000				

a. R quadrato = ,302 (R quadrato corretto = ,291)



Graph 68 – Global Technical Evaluation – ANOVA

2.2.10 Global Technical Evaluation - second assessment (2019)

The recorded values are expressed in points (p), according to the assessment performed by the coaches (1-5)

Table 85 – Global Technical Evaluation– Descriptive Statistics (p)

			Statistica	Errore std.
Global Score (1-5)_2	Mean		3,4945	0,07173
	95% confidence interval for the mean	Lower limit	3,3530	
		Upper limit	3,6360	
	Average cut out at 5%		3,5305	
	Median		4,0000	
	Variance		0,936	
	Std. deviation		0,96770	
	Minimum		1,00	
	Maximum		5,00	
	Interval		4,00	
	Interquartile interval		1,00	
	Asymmetry		-,0354	0,180
	Curtosis		-,0028	0,358

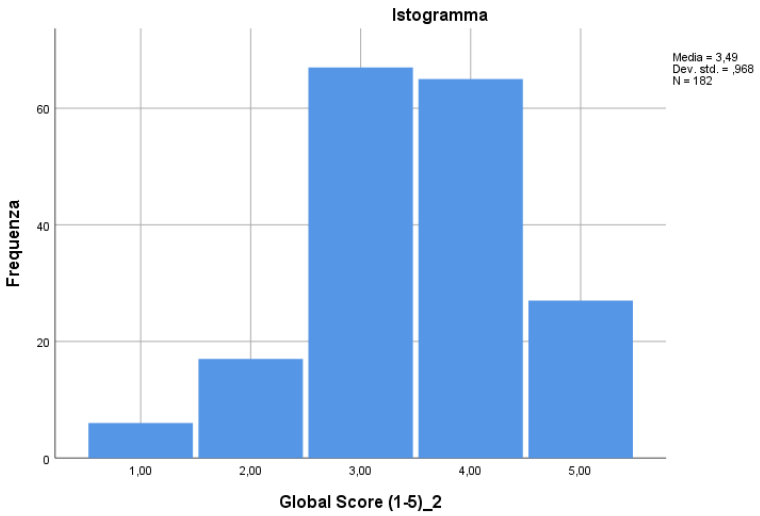
Table 86 – Global Technical Evaluation – Percentiles (p)

		Percentili						
		5	10	25	50	75	90	95
Media pesata (definizione 1)	Global Score (1-5)_2	2,0000	2,0000	3,0000	4,0000	4,0000	5,0000	5,0000
Cardini di Tukey	Global Score (1-5)_2			3,0000	4,0000	4,0000		

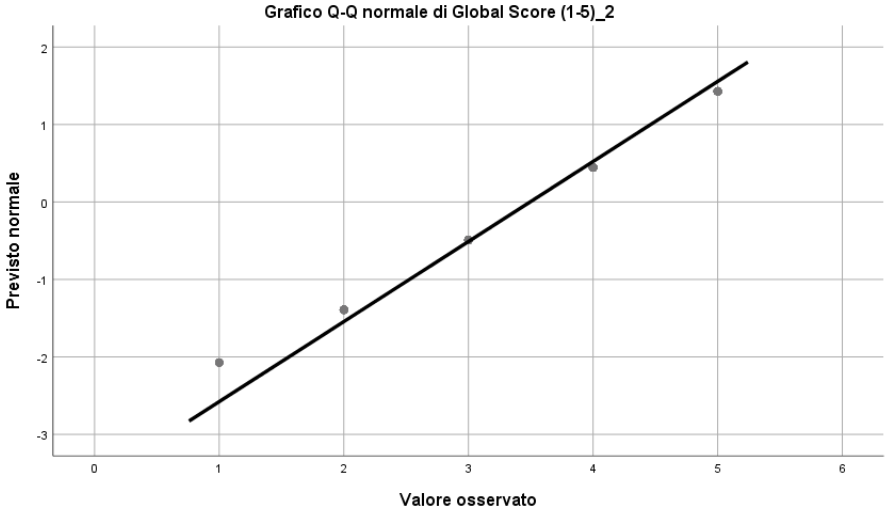
Table 87 – Global Technical Evaluation – Normality tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistica	gl	Sign.	Statistica	gl	Sign.
Global Score (1-5)_2	,205	182	,000	,892	182	,000

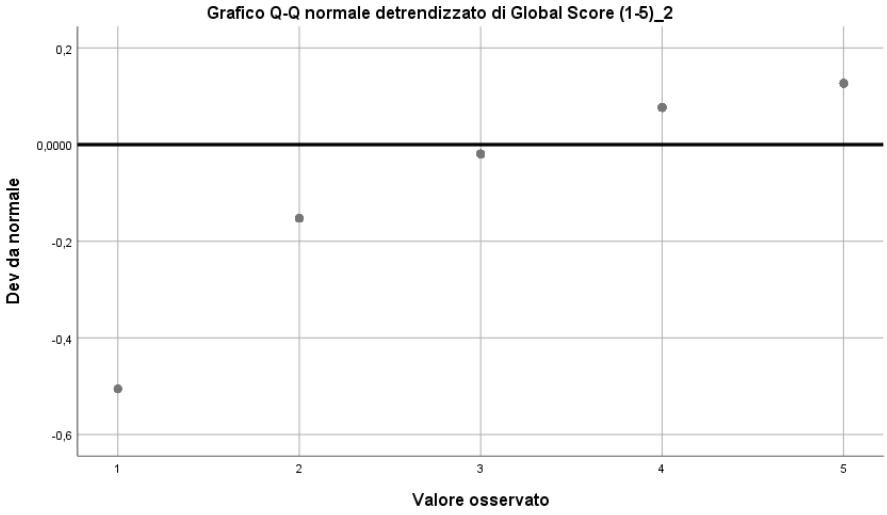
a. Correzione di significatività di Lilliefors



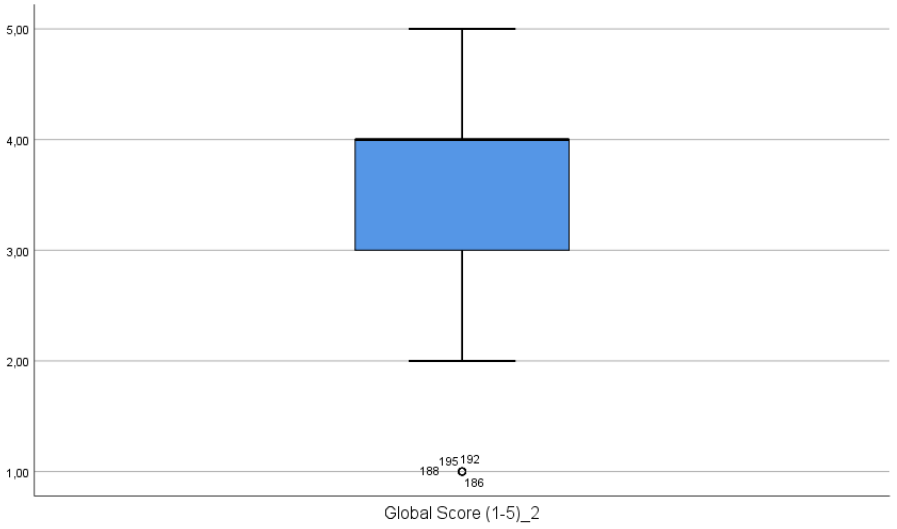
Graph 69 – Global Technical Evaluation – Histogram



Graph 70 – Global Technical Evaluation – Q-Q normal



Graph 71 – Global Technical Evaluation – Q-Q de-trended normal graph



Graph 72 – Global Technical Evaluation – Box Chart

Independent Test t: Control vs Experimental group (Global Technical Evaluation – second assessment)

Table 88 - Control vs Experimental group: descriptive statistics (Global Technical Evaluation)

Global Score (1-5)_2	Group	Mean	Std.Deviation	Standard error
	Control	3,5465	0,84932	0,09158
	Experimental	3,4479	1,06494	0,10869

Table 89 - Control vs Experimental group: independent test t (Global Technical Evaluation)

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
		F	Sign.	t	gl	Sign. (a due code)	Differenza della media	Differenza errore standard	Intervallo di confidenza della differenza di 95% Inferiore	Superiore
Global Score (1-5)_2	Varianze uguali presunte	3,373	0,068	0,685	180	0,494	0,09859	,14389	-,18533	,38252
	Varianze uguali non presunte			0,694	177,682	0,489	0,09859	,14213	-,18189	,37908

2.2.11 Comparative Analysis of the Physical and Technical Tests and the Global Technical Evaluation (Discriminant validity)

Table 90 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation: descriptive statistics and ANOVA – Discriminant Validity

					95% confidence interval for the mean	
		Mean	Std.Deviation	Std. Error	Lower limit	Upper limit
Test 10 m	Very Poor	2,248	,221	,090	2,017	2,480
	Poor	2,157	,228	,043	2,068	2,245
	Fair	2,184	,244	,030	2,124	2,244
	Good	2,149	,225	,028	2,092	2,205
	Very good	2,176	,237	,045	2,084	2,268
	Totale	2,169	,232	,017	2,136	2,202
Test 30 m	Very Poor	5,817	,580	,237	5,208	6,426
	Poor	5,298	,414	,077	5,141	5,456
	Fair	5,224	,401	,049	5,126	5,321
	Good	4,963	,391	,049	4,865	5,062
	Very good	5,026	,355	,067	4,889	5,164
	Totale	5,140	,434	,031	5,079	5,202
Yo-Yo IR1	Very Poor	.	.	.	.	.
	Poor	14,028	1,392	,328	13,336	14,720
	Fair	13,839	1,102	,141	13,557	14,121
	Good	14,300	,994	,128	14,043	14,557
	Very good	14,271	,980	,196	13,866	14,675
	Totale	14,094	1,092	,085	13,926	14,263
Technical Test n. 1	Very Poor	9,488	1,143	,511	8,069	10,907
	Poor	8,650	1,982	,381	7,866	9,434
	Fair	7,909	1,543	,187	7,535	8,282
	Good	7,979	1,289	,162	7,654	8,304
	Very good	7,992	1,661	,314	7,348	8,636
	Totale	8,090	1,566	,113	7,867	8,314
Technical Test n. 2	Very Poor	15,320	1,090	,488	13,966	16,674
	Poor	14,432	2,375	,441	13,529	15,336
	Fair	13,355	1,737	,211	12,935	13,776
	Good	13,756	3,031	,382	12,993	14,519
	Very good	12,858	1,442	,273	12,299	13,417
	Totale	13,627	2,334	,168	13,295	13,958

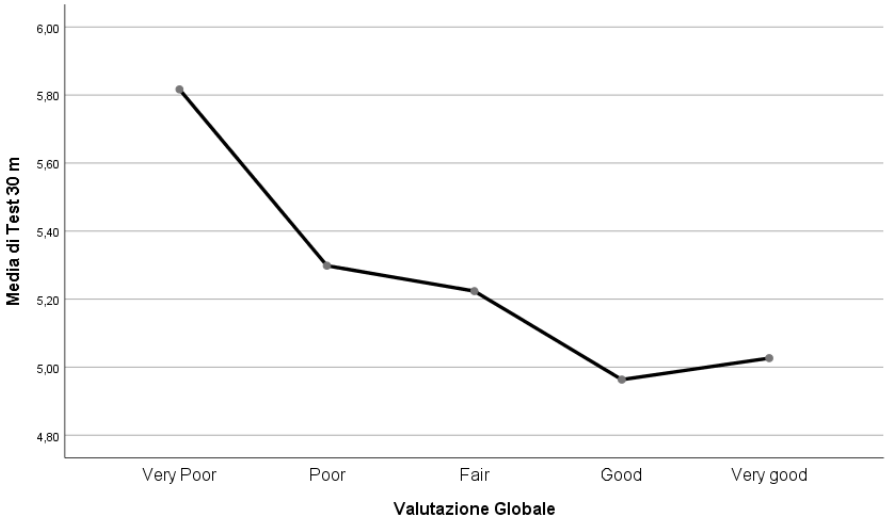
Table 91 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation: descriptive statistics and ANOVA – Discriminant Validity

		Mean	Std.Deviation	Std. Error	95% confidence interval for the mean	
					Lower limit	Upper limit
Technical Test n. 3	Very Poor	2,667	1,751	,715	,829	4,504
	Poor	2,520	1,475	,295	1,911	3,129
	Fair	2,448	1,654	,202	2,044	2,851
	Good	2,852	1,547	,198	2,456	3,249
	Very good	3,333	1,754	,338	2,639	4,027
	Totale	2,726	1,626	,119	2,491	2,961
Technical Test n. 4	Very Poor	13,667	6,890	2,813	6,436	20,897
	Poor	11,160	4,288	,858	9,390	12,930
	Fair	11,493	4,643	,567	10,360	12,625
	Good	11,967	3,816	,489	10,990	12,945
	Very good	14,185	3,223	,620	12,910	15,460
	Totale	12,065	4,303	,316	11,442	12,687

ANOVA

		Somma dei quadrati	gl	Media quadratica	F	Sign.
Test 10 m	Tra gruppi	,085	4	0,021	0,390	0,816
	Entro i gruppi	10,172	186	0,055		
	Totale	10,257	190			
Test 30 m	Tra gruppi	6,276	4	1,569	9,841	0,000
	Entro i gruppi	30,133	189	0,159		
	Totale	36,408	193			
Yo-Yo IR1	Tra gruppi	7,378	3	2,459	2,103	0,102
	Entro i gruppi	187,078	160	1,169		
	Totale	194,455	163			
Technical Test n. 1	Tra gruppi	21,513	4	5,378	2,251	0,065
	Entro i gruppi	444,418	186	2,389		
	Totale	465,932	190			
Technical Test n. 2	Tra gruppi	55,768	4	13,942	2,646	0,035
	Entro i gruppi	990,453	188	5,268		
	Totale	1046,222	192			
Technical Test n. 3	Tra gruppi	17,204	4	4,301	1,650	0,164
	Entro i gruppi	471,813	181	2,607		
	Totale	489,016	185			
Technical Test n. 4	Tra gruppi	179,778	4	44,944	2,507	0,044
	Entro i gruppi	3245,448	181	17,931		
	Totale	3425,226	185			

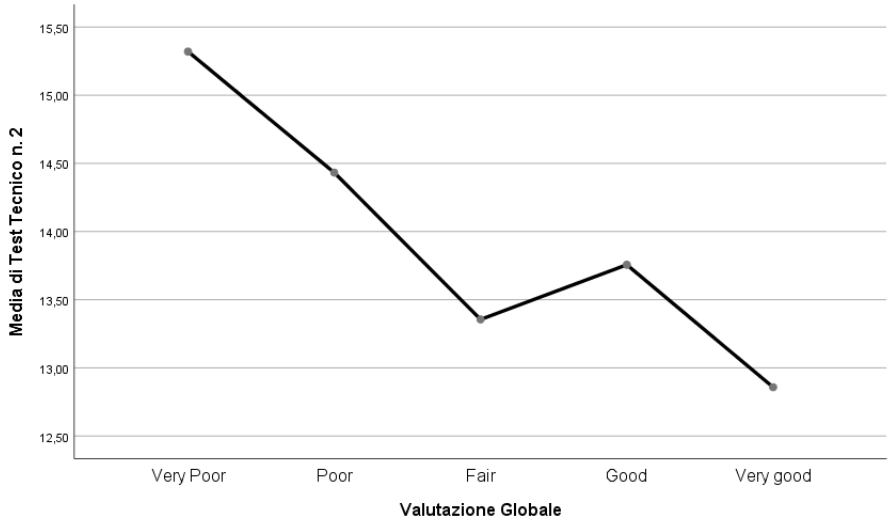
Graph 73 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – 10 m



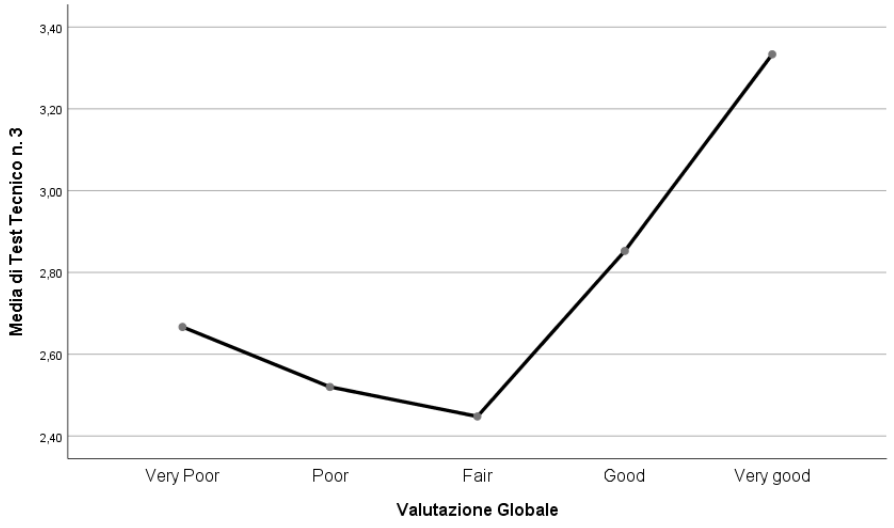
Graph 74 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – 30 m

Graph 75 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – Yo-Yo IR1

Graph 76 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – Technical Test n. 1



Graph 77 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – Technical Test n. 2



Graph 78 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – Technical Test n. 3

Graph 79 – Comparative analysis of the Physical and Technical Tests and the Global Technical Evaluation – Technical Test n. 4

Discussion

The study analysed the physical and technical tests carried out in the two planned periods (spring-summer 2017 and spring-summer 2019). The objective of the research was to verify:
1) the performance levels possessed by the participating athletes, also verifying the difference of these levels between the experimental group and the control group;
2) the discriminant validity of the tests in relation to the overall assessments provided by the different coaches and educators involved in the study.
The selected tests were those of a physical nature (10 and 30 m sprint and, through the yo-yo test, a verification on aerobic fitness) and some specific soccer skills (technical tests 1-4). We also took into our account the global assessments of the game ability of the players (1-5) provided by the involved coaches.
The 10-metre test highlights the physical ability to accelerate from a standstill. It is a very important ability in football players and the results are highlighted in tables 3-12. In 2017, as hypothesised, a substantial parity of acceleration capacity in the control and experimental groups was highlighted (table 7). This capacity was improved in 2019 in control group, albeit by a very modest amount ($p<0.05$), see tables 11 and 12.
The ability to sprint over 30 m is also considered as an important physical skill to be mastered in order to compete at the high level (table 13-17). As per the previous test, we performed an independent t-test (table 17) between the control and the experimental group, to verify possible significant differences. Indeed we found differences in the means ($p<0.05$), witnessing of a certain degree of better performance in the control group (5.17 vs 5.33, that is 3%). The second testing (2019) confirms this trend (table 23; $p<0.05$). Control group was faster for about a 3.90%.

The aerobic fitness and the endurance are physical components very important in the soccer's performance. We tested these abilities through a well-known fitness test called Yo-Yo IR1 test (tables 24-34). As per in the previous tests, we found significant differences between groups ($p<0.05$), both in the first testing (2017) and in the second one (2019). The entity of these differences ranging from 6.83% (2017) to 6.46% (2019).
The results indicating a substantial parity of the physical performances with a slight superiority of the control group over the experimental, as we expected to find in our hypotheses.

Under the technical point of view, we tested the players adopting the specific testing proposal provided by Rowat et al., implemented as procedure able to detect the most talented players. These tests are clearly explained in the method section of this report.
The results are presented trough tables and graphs (tables 35-89; graphs 28-72).
Technical testing n. 1 aimed at assessing the ability to fast dribbling the ball with a pass (tables 35-45; graphs 28-36). We found a significant difference between groups (control vs. experimental; $p<0.05$) both in first testing and in the second one (21.69% in 2017; 9.48% in 2019). The reduction of the differences found in 2017 and in 2019, respectively, witnessed the influence of both treatments (Socialsoccer and traditional soccer) on the players.
Technical testing n. 2 aimed at assessing the ability to fast dribbling the ball, making turns (tables 46-56; graphs 37-45). We found a significant difference between groups (control vs. experimental; $p<0.05$) in first testing, where the experimental group was faster than the control one ($p<0.05$; 10.73%); in the second testing (2019) we found no significant differences.
Technical testing n. 3 aimed at assessing the ability of passing with precision (tables 57-67; graphs 46-54). We found no significant differences between groups in first testing (2017). On the second testing (2019) we found significant differences between groups, being the experimental group a bit more precise than the control one (16.66%).
Technical testing n. 4 aimed at assessing the ability to shoot at goal with accuracy (tables 68-78; graphs 55-63). We found no significant differences between groups both in first testing (2017) and in the second one (2019).

We then asked all the coaches participating to this study to provide a global technical assessment of each player, regarding his game ability (table 79-89; graphs 64-72). We found significant differences ($p<0.05$) between groups in first testing (2017; 12.36%), being the control group evaluated a bit better than the experimental one. In second testing (2019) we found no significant differences ($p>0.05$) between groups.
We performed a comparative analysis of the physical and technical tests and the global technical evaluation in order to establish the discriminant validity of these tests (table 90-91 descriptive statistics and ANOVA). 30 meters sprinting, technical test n. 2 and n. 4 showed the highest level of validity, being able to predict the better players, as they were assessed by their coaches.

Conclusions

Soccer is a sport suitable for all ages, a particular experience that can involve both children and adults, male and female, skilled and less-skilled players, without the need for any specific level of motor abilities. Even those who do not stand out for the quality of their technical skills can, in the end, manage with significant ease to play with others, chase after the ball, their teammates and opponents; above all, they succeed in finding enjoyment, by making a particular move or scoring a goal. Technically, the ball is the main element needed to play. It represents the primary stimulus inherent in the game itself, which can then acquire a deeper significance as a tool for communication between the team members, who will try to hold onto the ball as much as possible by hiding it from their opponents. These latter, in turn, will try to penetrate the collective dialogue built by the other team. However, no particular conflict toward the opposing team is involved: this behaviour is part of the game, which is governed by rules defining permissible techniques for tackling and which foster each individual's skill within the collective action. If we try to trace our own personal history, we have all experienced at some time the above, whether it be on the parish playing fields, on dirt patches or in the pitches that are characteristic of the current scenario. Soccer embraces everyone, and the game provokes feelings of both bewilderment and exaltation that often emerge in our memories. Socialsoccer is therefore a mixture of incentives and opportunities, capable of engaging its participants, who become the protagonists of the game, without exception, given that inclusion is at its very foundation. One does not play against others: the aim of social Soccer is to play with others, and thus the game becomes like a party that rewards everybody, since the ethical values underpinning it enrich more than any other imposed, standard-issue educational activities, which consequently seem less and less attractive.

Socialsoccer rules are not only those normally set by the referee during a match. In fact, according to a broader definition of the term and of its meaning, Socialsoccer rules must be seen as educational actions aimed at social integration, at respect for values such as friendship, respect for others and the ability to accept the final result by emphasizing the positive aspects of both defeat and victory. Socialsoccer offers a helping hand to all, and if someone is in trouble, it will do everything to help them, to involve them and to draw from this experience new impetus and feelings which can be transferred from Soccer to everyday life. The CROSS project aimed at promoting a new vision of Soccer and sport, made of cooperation and tolerance. In this way, the athlete gets closer to the true conception of Soccer and sport. The integrity of sport is view as the ability to live Soccer activity as an opportunity of interaction and exchange of values. The Soccer field becomes an integrated community: an example of mutual respect and cultural diversity. Specific objectives of the project were:

- presenting and disseminating the methodology of Socialsoccer to promote inside and outside sport association a common sense of membership and participation of all as an important tool of integration. Thanks to values of fraternity and solidarity in the project, the partners intended to have a leading role in the social integration process and to contribute efficiently in the diffusion of respect and coexistence even outside of sports associations.
- understanding at which extent SocialSoccer may influence some of the human dimensions that possibly will be influenced by the participation to this particular form of sporting activity. The principal aim of the research project “CROSS–Tor Vergata” was to understand if the participation to this form of sporting might be useful to address consistently some of the major social issues that are raising in this specific age: inclusion and integration, overcoming gender, ages and religious barriers, lack of physical activity at different ages and level of ability.

With this study, we were able to demonstrate how Socialsoccer might be implemented also in “traditional” soccer schools, being sure that nor the overall game ability, some specific technical skill (i.e. dribbling, passing, receiving, shooting) nor the physical side of the performance might be negatively affected by this new method of teaching and training soccer. The substantial parity of the results, we found in the testing procedures we administered in 2017 and in 2019 both in control and in the experimental group, are in line with what we hypothesized while designing this research.

The Psycho-Social Research

Introduction

Man has always tended to judge, reject and prejudge everything that is different from him and his way of life.
It is precisely this fear of the unknown, of the unknown that leads us to lock ourselves up in ourselves, in the places and people that we consider most suitable and close to us.
Hence the construction of an important strategy that the human being must learn to use, categorization, which is not only a tool to divide people into groups, but also to help define ourselves, in order to strengthen our sense of identity.
The consequences of this selection are the creation of stereotypes and prejudices that lead to discrimination.

Methods

We started from this assumption to analyze the Socialsoccer, which is an example of life and how through sport it can improve, giving people the opportunity to fit into a community, to be part of a group where there is no fear, but only the desire to know each other without stopping at appearances, helping each other.
The research aims to understand if there can be an improvement in prejudice and its possible decrease through sport.
The man feels stronger and more powerful in a group and this is the reason that pushes him to be part of it, distancing and discriminating the outputs, or groups other than his own. From this assumption, a social analysis was carried out on the groups participating in this project.

Within the Socialsoccer are promoted values such as equality, inclusion, respect and the importance of collaboration. The study and composition of the questionnaire was based on the scientific literature and on what Socialsoccer represents and its rules.
In this regard, the aim of the research is to verify if there is really a correlation between participation in Socialsoccer and the reduction of some prejudices. Specifically within the research will be examined mainly three types of prejudices:
- Prejudice towards the elderly.
- Prejudice towards immigrants.
- Prejudice to women.
- Prejudice to disabled people.

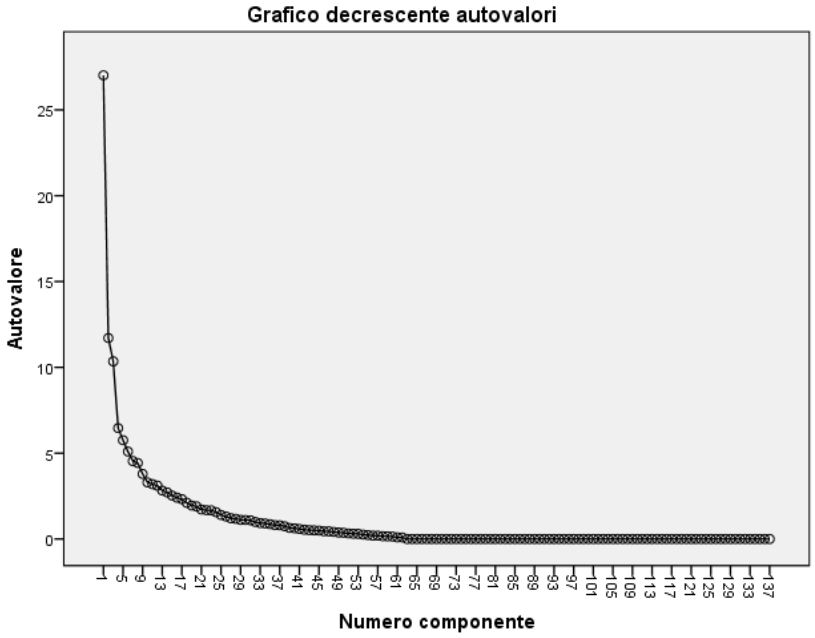
Through the examination of the latter it is therefore expected that the contact with the different outgroups within the team, leads to a change and thus to a decrease in prejudice. Moreover, we want to verify if the time of participation in tournaments can change the perception of the subjects towards these categories.
The research was carried out on a sample of participants in Socialsoccer, all male.
The average age of the participants is 12 years.
A questionnaire of 142 items was created for the collection of data and a six-step Likert scale was used for the answers.
The Likert scale consists of a series of statements that can express positive and negative attitudes to the topic.
The following constructs are present in the questionnaire:
- Prejudice to the Elderly, (Fabroni et al., 1990; Donizzatti, 2010)
- Prejudice to the Women, (Glick and Fiske,1996)
- Manifest and Latent Prejudice, (Pettrigrew and Meertens, 1995: Arcuri and Boca, 1996)
- Anxiety Intergroups, (Britt et al., 1996)
- Discriminatory actions
- Disabled injury, (Cameron, Rutland, 2006)
- Quality of life, (Varni et al., 2007)
- Empathy, (Davis 1980; Albiero et al.,2006)
- Social self-efficacy, (Muris, 2001; Caprara et al.1999)
- Social Desireability, (Crowne and Marlowe, 1960; Stober, 2001; Manganelli et al., 2006)

- Self-esteem, (Rosenberg, 1965)
- Satisfaction for life, (Diener et al., 1985)

At the beginning of the questionnaire, 5 distracting items were included, while on the last page you will find socio-demographic questions, such as age and area of residence.
This research has been conducted to verify if there is actually a way to decrease prejudice through sport, in this case with Socialsoccer.

Results

The study of the data was started with the analysis of the main components, this is a technique used to simplify the data, in this research has been used because there are many variables in the questionnaire.



The variables are represented in a Cartesian axis in descending order of variance, so that only the main ones can be verified and analysed. From this analysis 9 main components were found.

Once the main components had been established, others were isolated and compared on a test-retest time axis. This work was carried out through the analysis of the t-test.
The t-test is a parametric test, which is used to compare two averages.

Test per campioni appaiati

		Differenze a coppie					t	df	Sig. (2-code)
		Media	Deviazione std.	Errore std. Media	Intervallo di confidenza per la differenza al 95%				
					Inferiore	Superiore			
Coppia 1	C1T – C2T	12,15873	14,70923	1,85319	8,45426	15,86320	6,561	62	,000
Coppia 2	C2T - C2R	-22,47619	20,55901	2,59019	-27,65391	-17,29847	-8,677	62	,000
Coppia 3	C3t - C3R	-66,14516	25,60792	3,25221	-72,64835	-59,64197	-20,339	61	,000
Coppia 4	C4T - C4R	51,88889	15,94053	2,00832	47,87432	55,90346	25,837	62	,000
Coppia 5	C5T - C5R	-6,23810	7,41558	,93427	-8,10568	-4,37051	-6,677	62	,000
Coppia 6	C6T - C6R	32,73016	10,20311	1,28547	30,16054	35,29978	25,462	62	,000
Coppia 7	C7T - C7R	2,12698	8,16857	1,02914	,06976	4,18421	2,067	62	,043
Coppia 8	C8T - C8R	-7,85714	4,66233	,58740	-9,03134	-6,68295	-13,376	62	,000
Coppia 9	C9T - C9R	1,17460	5,47881	,69027	-,20522	2,55442	1,702	62	,094

Discussion

In the analysis of paired t-tests, the P shows that there was a very significant change, since the result is less than 0.05.
The only component that differs is the last one, whose value is 0.094, and therefore the change for this variable is not statistically significant, although we can consider it as a border-line value.
From the results emerged it is possible to find the functioning of the treatment in specific variables.
The treatment was effective in the second variable in which there are items concerning the prejudice towards women and disabled people, specifically there is a more positive consideration of disabled people and gender differences of women.
In the third variable, the result can be considered effective as regards both emotional and social self-efficacy and life satisfaction, regarding prejudice towards the elderly with respect to negative and discriminatory emotions.
The fifth variable proved to be effective, especially with regard to the elderly and contact with them.

In variable number eight, on the other hand, an effective result was found in that empathy for the assumption of others' perspectives regarding the elderly, self-esteem, quality of life for health and activity improved.
The variables that are not effective are the first in which there is no real decrease in manifest and latent prejudice towards immigrants and anxiety about contact between groups.
Variable four is not effective and concerns above all self-esteem and emotional self-efficacy which, on the other hand, in some respects seems to have improved in the third variable.
In the sixth variable, there was no change towards stereotypes and stereotypes of the elderly and empathy.
In the seventh variable, empathy for the assumption of the perspective of others is not effective.
In the ninth variable, empathic consideration is not effective.

Conclusions

Ultimately, it can be stated that the Socialsoccer has an effective correspondence in people, the contact is positive for the decrease in prejudice towards the elderly, women and disabled, but it is still difficult to find a decrease for the prejudice towards immigrants.
It is also important to consider that the social context in which we live does not help the decrease of this and perhaps it would be useful to increase the contact and keep it prolonged even longer to have a better result.

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