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Principal Component Approach and Relationship between Nomination Scale for Identification of Football Talent and Physical Fitness in Young Soccer Players

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Abstract: The present study aimed to investigate the relationship between the physical capabilities of young soccer players and their performance in game-related variables as assessed through the Nomination Scale for Identifying Football Talent (NSIFT) questionnaire. A total of 80 young soccer players, with an average age of 10.70 ± 1.02 years, participated in the research. Each player underwent a comprehensive assessment session that included the 5-0-5 Change of Direction (COD) test, the Illinois Agility Test, and the Countermovement Jump (CMJ) test. These assessments were selected to evaluate critical physical attributes essential for soccer performance such as agility, explosive strength, and the ability to change direction rapidly. To analyze the data, Principal Component Analysis (PCA), a statistical technique that reduces the dimensionality of large datasets while retaining as much variance as possible, was employed. The PCA results indicated strong sample validity as confirmed by the Kaiser–Meyer–Olkin (KMO) measurement index, which assesses the adequacy of the sample size for factor analysis. The analysis revealed two principal components: development and disposition, which together accounted for 73% of the total variance in the data. The development component encompasses various physical attributes that contribute to a player's growth and improvement, including strength, speed, and agility. Conversely, the disposition component reflects innate qualities and cognitive skills that predispose players to excel in soccer such as decision making and game awareness. This research highlights the importance of incorporating physical assessments into talent identification processes, providing objective measures that complement subjective evaluations. This study contributed to the literature on talent identification in soccer, emphasizing the need for a multidisciplinary approach to nurture young athletes effectively. Future research should continue to explore the interplay between physical and cognitive skills in soccer to enhance player development and success in competitive environments.

Keywords: COD; football; talent identification; multidisciplinary approach

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1. Introduction

Soccer stands out as one of the most widely played and followed sports globally. However, the journey from being a promising young talent to achieving a successful professional career in adulthood poses significant challenges today [1]. Talent identification (TID) plays a crucial role in this process, aiming to pinpoint individuals who are likely to excel in the sport [2]. To effectively identify players with the highest potential for future success, TID and development processes have gained increasing importance in recent years [3]. This involves not only recognizing talent but also providing the necessary environment and support to help these players realize their full potential. The landscape of high-level performance in soccer is complex, with various factors influencing a player's success [4]. Traditionally, experienced coaches have evaluated player potential based on subjective criteria shaped by their personal experiences and insights [5,6]. In fact, coaches are responsible for making critical decisions regarding player selection for clubs, promotions to higher categories, and choices for provincial, regional, or national teams [7,8]. Recently, there has been a shift towards integrating objective assessments alongside these subjective evaluations, offering a more holistic view of talent identification and development [9].

In recent years, various scientific methods have been developed for talent identification, focusing on physiological, technical, tactical, and psychological skills [8,10]. These technical [11] and tactical attributes [1], along with psychological factors [10], play a significant role in soccer performance. Given the individual differences in maturation, development, learning capabilities, and the rapid physiological and anthropometric changes that occur during adolescence [11], selecting athletes solely based on their current performance may inadvertently overlook late-maturing players who possess the potential for future success [12,13]. The rapid advancement of technology in team sports has resulted in an overwhelming quantity of data, highlighting the need for effective data mining techniques. This has led to the adoption of data reduction methods such as Principal Component Analysis (PCA) [14]. Evaluating performance in team sports requires the consideration of various variables including technical, tactical, and conditional aspects. Developing a modeling process that provides a holistic view of team dynamics presents a challenge [14]. PCA can be instrumental in distilling the most pertinent information regarding player characteristics, which can then be used to assess performance in subsequent analyses [15].

The last end of talent development is to cultivate athletes capable of performing at the highest levels in the future, making it essential to identify indicators that assess long-term potential [13]. In this regard, measures of motor control and accuracy have proven effective in differentiating skill levels, alongside physiological data, age, maturation, playing profile, and physical fitness [16]. However, these metrics should be supplemented with assessments of sprints, agility, and vertical strength including Change of Direction (COD) tests [17], the Illinois Agility Test [18], and the Countermovement Jump (CMJ) test [19]. It is important to investigate the talent-related variables linked to competition and their correlation with various physical fitness assessments that evaluate agility, Change of Direction, and jump height. COD, which refers to the ability to accelerate, decelerate, pivot, and quickly change direction, is a vital aspect of a soccer player's motor skills [20]. The speed of COD is primarily defined by an athlete's capacity to decelerate swiftly during gameplay and then rapidly accelerate in a new direction [21].

Biomechanical factors, including the stages of acceleration, deceleration, foot contact time, and subsequent acceleration towards a new direction, are crucial for effective execution [22]. In this regard, the speed of Change of Direction (COD) reflects the physical aspect of agility while cognitive elements such as perception and decision making form the foundational components of agility [23]. The biceps femoris plays a significant role in enhancing the COD during deceleration. Research by Ramirez-Campillo et al. (2018) [24] indicates that eccentric braking force is essential for minimizing braking time and enhancing COD performance. Additionally, studies by Ferley et al. (2020) [25] and Shamshuddin et al. (2020) [26] found that plyometric training, assessed through the Countermovement Jump

(CMJ), led to notable improvements in speed and strength capabilities among soccer players, demonstrating the effectiveness of plyometric exercises in enhancing athletic performance.

While numerous studies have examined talent identification (TID) in both young and adult soccer players, there remains a lack of information regarding the influence of physical attributes like COD, agility, and vertical jump strength, particularly in relation to cognitive and tactical game variables. This study aimed to investigate whether straightforward, valid, and relatively brief tests that integrate physical performance and game variable assessments—using the Nomination Scale for Identifying Football Talent (NSIFT) questionnaire—can effectively identify and differentiate talented young soccer players. In this context, Principal Component Analysis (PCA) is viewed as a suitable method for condensing extensive data into a manageable number of variables, particularly within the sports domain.

2. Materials and Methods

2.1. Participants

A total of eighty young male soccer players participated in this research, with an average age of 10.70 ± 1.02 years, an average height of 145.8 ± 8.32 cm, and an average weight of 37.95 ± 5.69 kg. These players were selected from the Real Club Deportivo Espanyol (RCDE) Granada, a soccer club located in Granada, Spain, which is affiliated with the RCDE team that competes in LaLiga Santander, the top division of Spanish football. The players trained twice a week for 90 min each session and participated in one match weekly. Their training followed the principles of Tactical Periodization [27] and typically included a warm-up, a main training segment, and a cooldown. During the 2021/2022 season, they competed in various provincial categories within the province of Granada (Andalusia).

Inclusion criteria for participant groups in this study were (i) being active and playing in soccer teams, (ii) reporting no partial/chronic injury and no history of neuropsychological impairment that could affect the results of the experiment, (iii) providing written informed consent, and (iv) completing all different tasks during the study. The main aims of the study were communicated to the participants, who then signed an informed consent form. All students were treated in accordance with the guidelines set forth by the American Psychological Association. The study was conducted in accordance with the ethical principles of Helsinki Declaration for human research and was approved by the Research Ethics Committee of the University of Granada (nº 3882/CEIH/2023).

2.2. Procedure

Initially, the research team briefed the coaching staff on the study's goals, and informed consent was obtained from the parents after they were provided with information regarding the potential benefits and risks involved. The study consisted of three sessions. (i) First NSIFT Session: In this session, a 20 min explanation was provided to the coaches on how to complete the questionnaire, followed by 40 min for them to fill it out. (ii) Familiarization Session: During this session, anthropometric measurements such as of body weight and standing height were recorded for the players. They then underwent a warm-up, followed by the CMJ, the 505 COD test, and the Illinois Agility Test. (iii) Experimental Session: This session was identical to the familiarization session but was specifically designated for data collection (see Figure 1 for more information).

The data collection took place during the players' regular training sessions, ensuring that all tests were conducted at least 48 h after their last competitive match and without any intense exercise in the 24 h leading up to the tests. Prior to testing, participants engaged in a standardized warm-up that included light aerobic activities, dynamic stretching, mobility exercises, progressive sprints, and planned submaximal directional changes. The tests were conducted under optimal conditions, with no rain on either testing day or an average temperature of 19 °C (19.2 ± 2.4 °C). The data collection occurred on a synthetic artificial turf field (4G). Each test was overseen by the lead researcher and administered by trained physical trainers, ensuring accurate and reliable data recording.

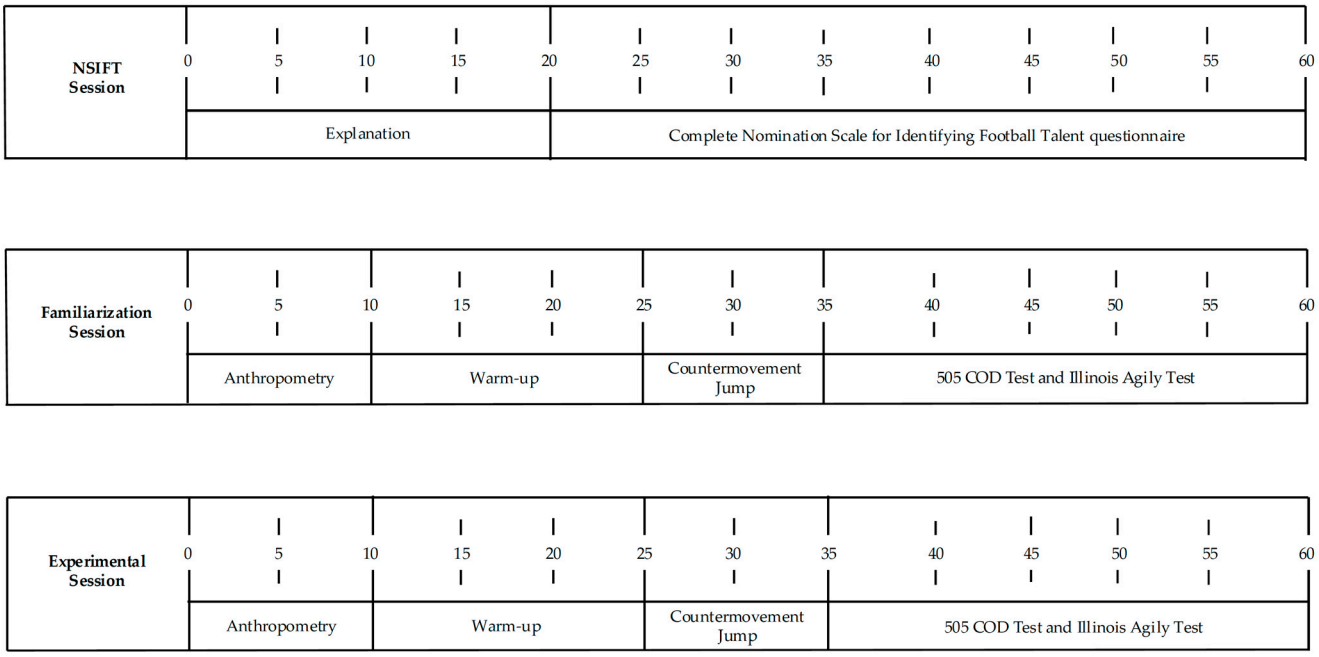


Figure 1. Schematic representation of the study design.

2.3. Instruments

2.3.1. Nomination Scale for Identifying Football Talent Questionnaire (NSIFT)

The NSIFT questionnaire is utilized to assess potential talent soccer players [9]. This validated instrument aids in identifying skilled players by examining three key areas: (i) tactical and technical abilities; (ii) creativity, and (iii) commitment. The NSIFT questionnaire consists of 13 items, which include statements such as the following: (1) Correctly interprets the coach's instructions. (2) Often anticipates gameplay. (3) Typically makes sound decisions. (4) Executes skills rapidly. (5) Quickly comprehends the game situation. (6) Demonstrates good positional awareness. (7) Understands teammates' locations on the field. (8) Shows effort during matches and training. (9) Eager to learn and improve. (10) Maintains focus during matches and training. (11) Exhibits a competitive mindset. (12) Maintains a positive outlook. (13) Accepts responsibilities willingly. The scale does not include any negative items. The club's sports director completes the questionnaire using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), ensuring a balanced evaluation based on the knowledge of all participating players. The internal consistency of the NSIFT questionnaire in this study was found to be 0.85, as measured by Cronbach's Alpha.

2.3.2. Anthropometry

Height and weight measurements were taken at the same time and on the same day of the week for both assessment sessions. Height was measured using a TANITA body composition scale (RD-545 HR) with an accuracy of 0.1 cm. Players were instructed to remove their shoes and any accessories that could influence the measurements. They were required to stand upright, with their arms at their sides and their gaze directed forward. Each player was measured only once.

2.3.3. Countermovement Jump

The Countermovement Jump (CMJ) was assessed using the Chronojump-Boscosystem® platform (Barcelona, Spain), which was developed by de Blas et al. (2012) [28] and demonstrated a correlation coefficient ranging from 0.821 to 0.949 for jump height measurements. The system was linked to an ASUS Rog Strix computer running Windows 11 Pro and data were analyzed using Chronojump version 2.2.1. Following a warm-up, each player

completed three CMJ trials on the platform, with a 40 s rest between each attempt to reduce fatigue. The final score was determined by calculating the average jump height in centimeters. Participants were instructed to jump as high as possible after bending their knees to approximately 90 degrees, keeping their hands on their hips and legs straight in full plantar flexion. If any of these criteria were not fulfilled, the jump was repeated.

2.3.4. 505 COD Test

The 505 COD test measures deceleration and agility. To perform the test, the soccer player starts at the 15 m mark, runs to the line, and crosses the 5 m mark before turning at the line and returning to the 5 m mark. The timing was recorded using Chronojump-Boscosystem® photocells (Barcelona, Spain), developed by de Blas et al. (2012) [28] and stopped when the athlete crossed the 10 m line and timing gate for the second time. Each player undertook two trials, with a recovery period of 3 to 5 min between tests. This system assesses agility, reaction time, speed, and coordination in soccer. The optoelectronic devices were set to the appropriate height based on the average height of the participants.

2.3.5. Illinois Agility Test

The Illinois Agility Test consists of a 10 m long and 5 m wide course. The athlete starts by lying face down on the ground, with their head just behind the starting line and arms bent with hands under their shoulders. Fitness trainers are positioned at both the start and finish lines, counting down "three, two, one, go". Upon the signal, the soccer player must quickly rise, sprint to the first cone, and execute a 180° turn, then proceed to the second cone for another 180° turn. The player then navigates through four cones spaced within the 10 m distance, makes another 180° turn, and passes through the cones again. Finally, the athlete completes a 180° turn, runs 10 m to the penultimate cone, turns again, and sprints to the finish line. All turns must be made around the cones rather than over them. Timing was recorded using Chronojump-Boscosystem® photocells (Barcelona, Spain), developed by de Blas et al. (2012) [28], and stopped when the athlete crossed the finish line. Each player performed two trials, with timing adjusted to ensure equal rest for all participants. The best score from the attempts was used for analysis [18].

2.4. Statistical Analysis

All analyses were performed using Statistica software (version 13.1; Statsoft, Inc., Tulsa, OK, USA), with a significance threshold set at $p < 0.05$. Descriptive statistics were computed for each variable and normality and homogeneity were assessed using the Kolmogorov–Smirnov and Levene's tests, respectively. Pearson's correlation coefficient (r) was utilized to explore the relationships between anthropometric measures and talent values, as well as between physical fitness talent values. The correlation magnitudes were interpreted as follows: $r \leq 0.1$ (trivial), $0.1 < r \leq 0.3$ (small), $0.3 < r \leq 0.5$ (moderate), $0.5 < r \leq 0.7$ (large), $0.7 < r \leq 0.9$ (very large), and $r > 0.9$ (almost perfect). Additionally, regression analysis was conducted to determine which anthropometric and physical fitness values most effectively explained the talent of young soccer players, with R^2 values interpreted as follows: >0.02 (small), >0.13 (medium), and >0.23 (large). Subsequently, an exploratory factor analysis using PCA was also performed on 13 performance metrics with varimax rotation. This method helps identify clusters of variables, effectively reducing the dataset into meaningful factors [29]. The highest principal component loadings were calculated to reveal correlations between performance metrics and their respective components. This analysis enhances understanding of the performance values that significantly influence results and their association with newly created principal components. Furthermore, the exploratory factor analysis considered descriptive statistics and the component correlation matrix, followed by orthogonal (varimax) and inverse rotations of all measured variables, adhering to established analytical protocols [30]. The Kaiser–Meyer–Olkin (KMO) measure [31] and communalities post-extraction [32] were used to assess sampling adequacy. Bartlett's test of sphericity was applied to evaluate the adequacy of correlations among

items. Kaiser's criterion of 1 [33] and the scree plot interpretation were utilized for factor retention, with performance indicators showing factor loadings greater than 0.7, indicating strong correlations and significant value for interpretation [33].

3. Results

Table 1 shows the results of descriptive statistics for all variables that were included in the study.

Table 1. Anthropometrical measures, physical fitness, and Nomination Scale for Identification Football Talent (means ± SDs).

			Young Soccer Players (n = 80)	
	Mean ± SD	**LCI 95%**	**UCI 95%**	**CI**
Anthropometrical measures				
Height (cm)	141.60 ± 0.09	139.56	143.64	2.06
Weight (kg)	35.27± 6.31	35.27	38.03	1.38
Physical Fitness Test				
Countermovement Jump (cm)	24.25± 3.55	23.47	25.03	0.78
Illinois Agility Test (s)	19.34± 1.11	19.10	19.58	0.24
505 COD test (s)	2.90 ± 0.17	2.86	2.94	0.04
NSIFT Items				
I1	7.75 ± 1.40	7.05	8.44	0.69
I2	7.60 ± 1.70	6.76	8.43	0.83
I3	7.37 ± 1.49	6.64	8.10	0.73
I4	7.30 ± 1.80	6.41	8.18	0.88
I5	7.40 ± 1.44	6.69	8.10	0.70
I6	7.57 ± 1.70	6.73	8.41	0.83
I7	7.72 ± 1.61	6.93	8.51	0.79
I8	8.37 ± 1.54	7.61	9.13	0.75
I9	8.80 ± 1.11	8.25	9.34	0.54
I10	8.10 ± 1.70	7.26	8.93	0.83
I11	8.25 ± 1.83	7.35	9.14	0.89
I12	8.22 ± 2.15	7.16	9.28	1.05
I13	7.87 ± 1.88	6.95	8.79	0.92

Note—LCI 95%: Lower Confidence Interval; UCI 95%: Upper Confidence Interval; CI: Confidence Interval; NSIFT: Nomination Scale for Identification Football Talent ((I1) Interprets the coach's instructions correctly; (I2) Usually anticipates play; (I3) Generally, makes the right decision; (I4) Executes skills very quickly; (I5) Able to read the game clearly and quickly; (I6) Has good positional sense; (I7) Knows where their teammates are on the pitch; (I8) Makes an effort in matches and training; (I9) Keen to learn and develop; (I10) Able to concentrate in matches and training; (I11) Possesses a winning mentality; (I12) Has a positive attitude; (I13)).

Correlation analysis was performed for the Nomination Scale for Identifying Football Talent questionnaire and weight, the CMJ, 505 COD tests, and Illinois Agility Test. Crucially, the dataset did not reveal any significative correlation between NSIFT and weight (see Supplementary Materials). However, different correlations were revealed for the CMJ, 505 COD tests, and Illinois Agility Test. (See Table 2 for more information). To elucidate the comprehension of the correlation analysis, analyses of figures of correlation were performed with each significative item from the Nomination Scale for Identifying Football Talent questionnaire with results from the CMJ (Figure 2), 505 COD test (Figure 3), and Illinois Agility Test (Figure 4).

Finally, a multiple regression analysis was performed to verify which physical fitness test (in agreement with the correlation analysis) could be used to better explain the importance of different talent values. For more information, see Table 3.

Table 2. Correlation analysis involving each item from Nomination Scale for Identifying Football Talent questionnaire and weight, CMJ, 505 COD test, and Illinois Agility Test (n = 80).

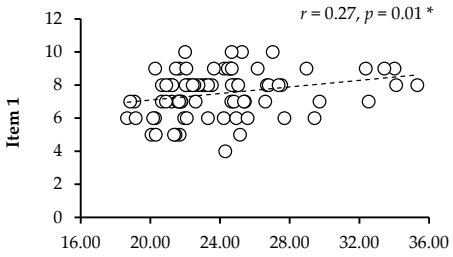
NSIFT Items	Weight r and p	CMJ r and p	505 COD test r and p	Illinois Agility Test r and p
I1	r = 0.20, p = 0.07	r = 0.27, p = 0.01 *	r = −0.20, p = 0.06	r = −0.27, p = 0.01 *
I2	r = 0.05, p = 0.64	r = 0.31, p = 0.004 *	r = −0.28, p = 0.01 *	r = −0.38, p = 0.001 **
I3	r = 0.07, p = 0.48	r = 0.26, p = 0.02 *	r = −0.25, p = 0.02 *	r = −0.38, p = 0.001 **
I4	r = 0.08, p = 0.45	r = 0.28, p = 0.01 *	r = −0.33, p = 0.002 **	r = −0.39, p = 0.001 **
I5	r = 0.01, p = 0.89	r = 0.28, p = 0.01 *	r = −0.25, p = 0.02 *	r = −0.43, p = 0.001 **
I6	r = 0.16, p = 0.14	r = 0.25, p = 0.02 *	r = −0.14, p = 0.20	r = −0.40, p = 0.001 **
I7	r = 0.04, p = 0.70	r = 0.18, p = 0.10	r = −0.09, p = 0.42	r = −0.36, p = 0.001 **
I8	r = 0.15, p = 0.18	r = 0.26, p = 0.02 *	r = −0.24, p = 0.02 *	r = −0.25, p = 0.02 *
I9	r = 0.10, p = 0.36	r = 0.19, p = 0.09	r = −0.19, p = 0.09	r = −0.20, p = 0.06
I10	r = −0.11, p = 0.29	r = 0.20, p = 0.07	r = −0.30, p = 0.005 *	r = −0.39, p = 0.001 **
I11	r = 0.01, p = 0.93	r = 0.30, p = 0.05 *	r = −0.26, p = 0.02 *	r = −0.34, p = 0.002 **
I12	r = 0.01, p = 0.87	r = 0.06, p = 0.54	r = −0.22, p = 0.05 *	r = −0.16, p = 0.13
I13	r = 0.09, p = 0.42	r = 0.30, p = 0.005 *	r = −0.18, p = 0.10	r = −0.30, p = 0.06

Note—NSIFT: Nomination Scale for Identification Football Talent: (I1) Interprets the coach's instructions correctly; (I2) Usually anticipates play; (I3) Generally, makes the right decision; (I4) Executes skills very quickly; (I5) Able to read the game clearly and quickly; (I6) Has good positional sense; (I7) Knows where their teammates are on the pitch; (I8) Makes an effort in matches and training; (I9) Keen to learn and develop; (I10) Able to concentrate in matches and training; (I11) Possesses a winning mentality; (I12) Has a positive attitude; (I13) Willing to take on responsibilities. * Denotes significance at $p < 0.05$ and ** denotes significance at $p < 0.01$.

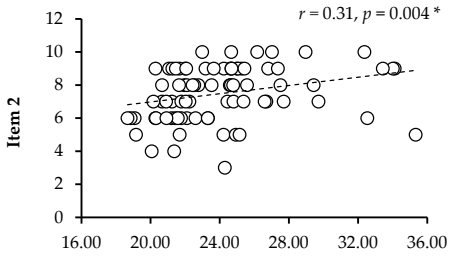
Table 3. Values of regression analysis explaining the relevance of physical fitness tests to better explain the talent values.

Physical Fitness Test	NSIFT Items	R	R^2	AR^2	F	P	SE
505 COD Test	I2	0.28	0.08	0.07	6.80	0.01 *	1.47
	I3	0.26	0.07	0.05	5.43	0.02 *	1.32
	I4	0.33	0.11	0.10	9.85	0.001 **	1.55
	I5	0.25	0.06	0.05	5.39	0.02 *	1.37
	I8	0.25	0.06	0.05	5.19	0.03 *	1.37
	I10	0.31	0.09	0.08	8.18	0.01 *	1.52
	I11	0.27	0.07	0.06	5.96	0.02 *	1.61
	I12	0.22	0.05	0.04	4.10	0.05 *	1.87
Illinois Agility Test	I1	0.28	0.08	0.07	6.80	0.01 *	1.47
	I2	0.39	0.15	0.14	13.94	0.001 **	1.41
	I3	0.38	0.15	0.14	13.34	0.001 **	1.26
	I4	0.40	0.16	0.15	14.44	0.001 **	1.51
	I5	0.43	0.19	0.18	18.19	0.001 **	1.28
	I6	0.40	0.16	0.15	14.72	0.001 **	1.42
	I7	0.37	0.13	0.12	12.10	0.001 **	1.37
	I8	0.25	0.06	0.05	5.29	0.02 *	1.37
	I11	0.39	0.16	0.14	14.35	0.001 **	1.47
	I12	0.35	0.12	0.11	10.82	0.001 **	1.57
	I13	0.30	0.09	0.08	7.86	0.01 *	1.67
Countermovement Jump	I1	0.27	0.07	0.05	6.14	0.02 **	1.31
	I2	0.32	0.10	0.09	8.83	0.001 **	1.45
	I3	0.27	0.07	0.06	6.04	0.02 *	1.32
	I4	0.28	0.08	0.07	6.73	0.01 *	1.57
	I5	0.28	0.08	0.07	6.72	0.01 *	1.36
	I6	0.25	0.06	0.05	5.32	0.02 *	1.50
	I8	0.26	0.07	0.06	5.88	0.02 *	1.36
	I11	0.31	0.10	0.08	8.24	0.01 *	1.59
	I13	0.31	0.10	0.09	8.27	0.01 *	1.67

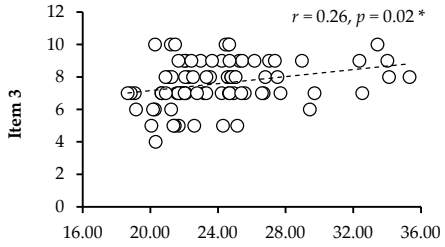
Note—AR: Adjusted R; NSIFT: Nomination Scale for Identification Football Talent: (I1) Interprets the coach's instructions correctly; (I2) Usually anticipates play; (I3) Generally, makes the right decision; (I4) Executes skills very quickly; (I5) Able to read the game clearly and quickly; (I6) Has good positional sense; (I7) Knows where their teammates are on the pitch; (I8) Makes an effort in matches and training; (I9) Keen to learn and develop; (I10) Able to concentrate in matches and training; (I11) Possesses a winning mentality; (I12) Has a positive attitude; (I13) Willing to take on responsibilities. * Denotes significance at $p < 0.05$ and ** denotes significance at $p < 0.01$.



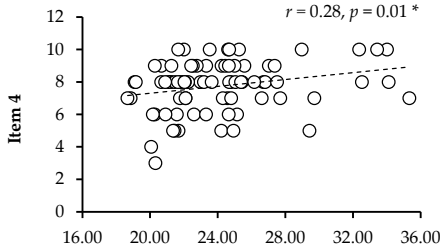
Correlation analysis involving (I1) Interprets the coach's instructions correctly and CMJ.



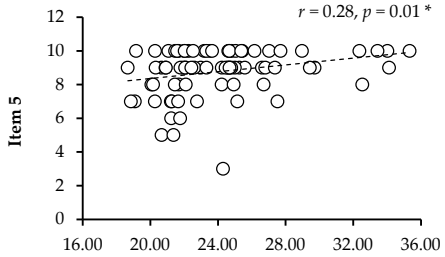
Correlation analysis involving (I2) Usually anticipates play and CMJ.



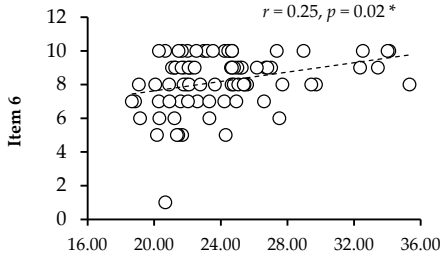
Correlation analysis involving (I3) Generally, makes the right decision and CMJ.



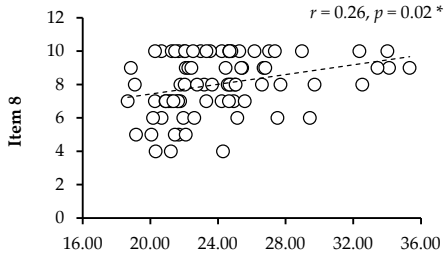
Correlation analysis involving (I4) Executes skills very quickly and CMJ.



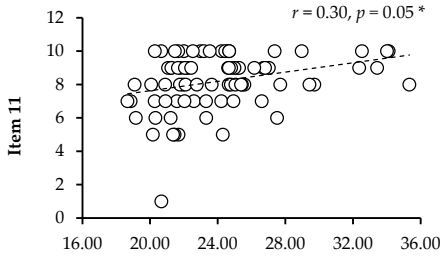
Correlation analysis involving (I5) Able to read the game clearly and quickly and CMJ.



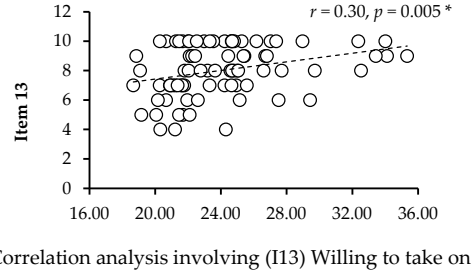
Correlation analysis involving (I6) Has good positional sense and CMJ.



Correlation analysis involving (I8) Makes an effort in matches and training and CMJ.



Correlation analysis involving (I11) Possesses a winning mentality and CMJ.



Correlation analysis involving (I13) Willing to take on responsibilities and CMJ.

Figure 2. Correlation analysis involving each significative item from Nomination Scale for Identifying Football Talent questionnaire with results (n = 80). * Denotes significance at $p < 0.05$.

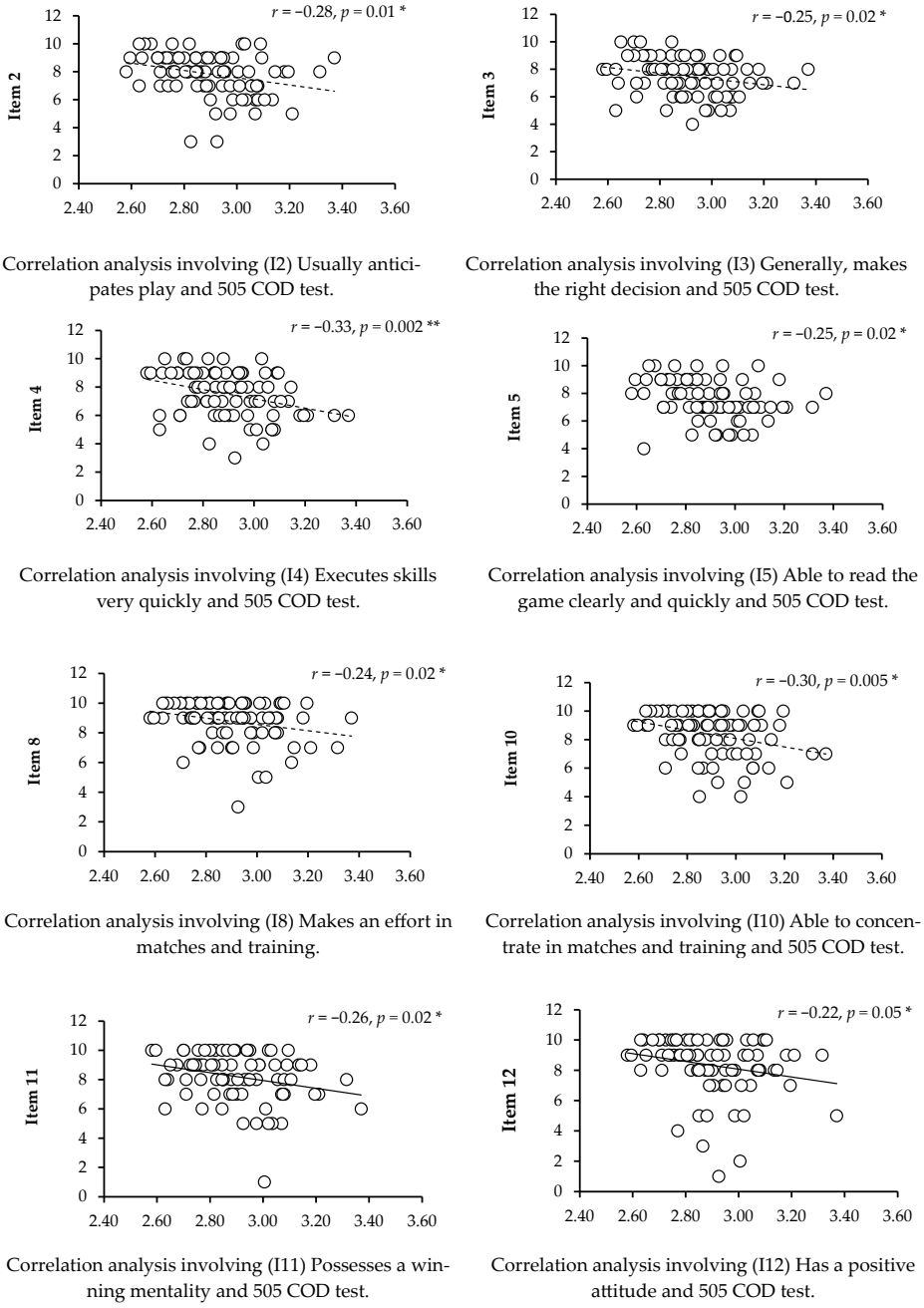


Figure 3. Correlation analysis involving each significative item from Nomination Scale for Identifying Football Talent questionnaire with results from 505 COD test (n = 80). * Denotes significance at $p < 0.05$ and ** denotes significance at $p < 0.01$.

The Kaiser–Meyer–Olkin (KMO) measure was employed to assess the adequacy of the sample for the analysis, yielding values between 0.83 and 0.95, which indicated a good level of sampling adequacy. In the analysis, two components emerged with eigenvalues exceeding the Kaiser criterion of 1, collectively accounting for 73% of the total variance observed in the data. The Factor Scores Matrix, utilizing Bartlett's Methods, demonstrated that the correlations for each identified factor were significantly large (p = 0.00), confirming the robustness of the factor structure (see Table 4).

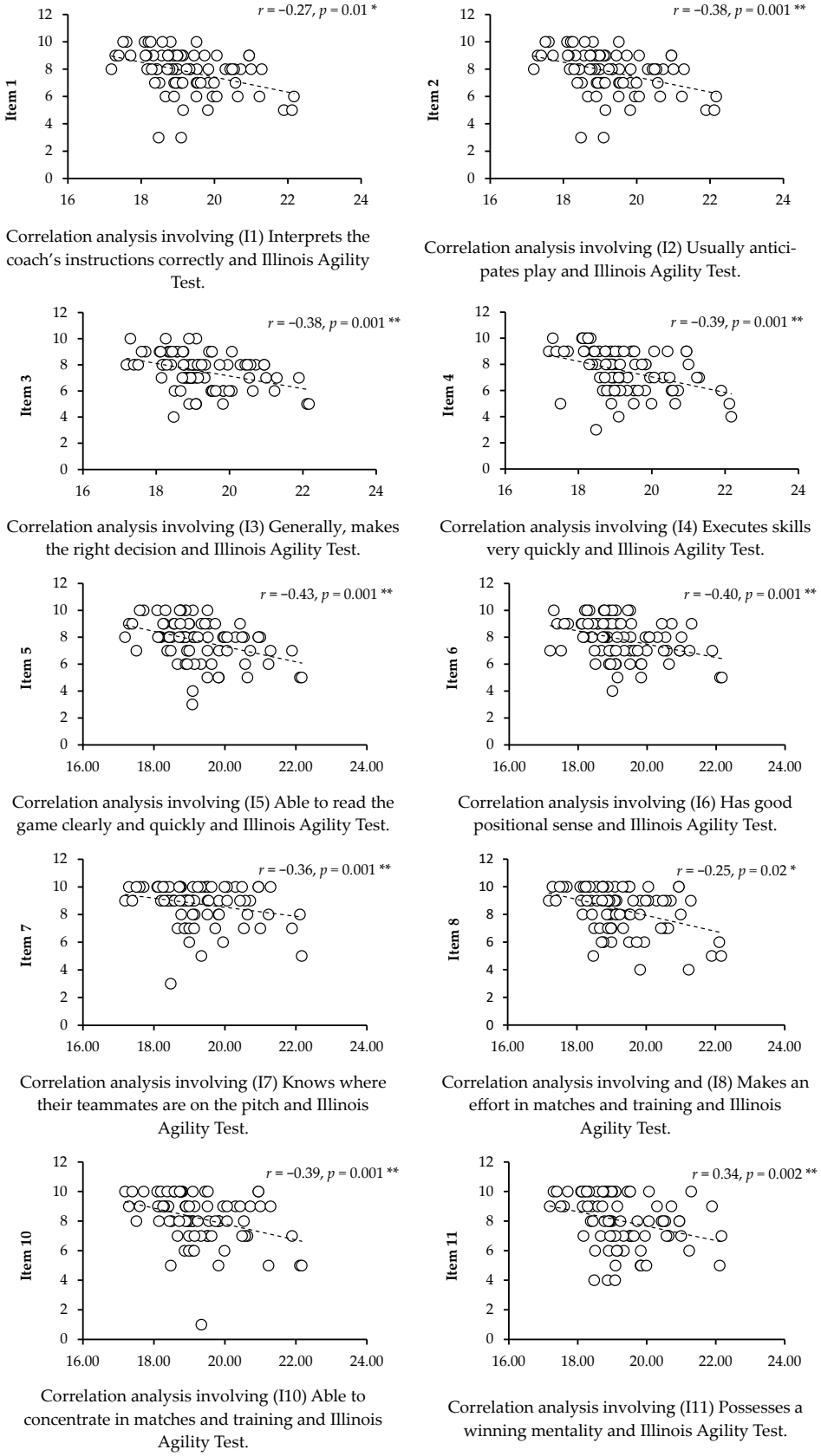


Figure 4. Correlation analysis involving each significative item from Nomination Scale for Identifying Football Talent questionnaire with results from Illinois Agility Test (n = 80). * Denotes significance at $p < 0.05$ and ** denotes significance at $p < 0.01$.

Table 4. Eigenvalue components and total variance explained.

		1	2	3	4	5	6	7	8	9	10	11	12	13
IE	**T**	7.946	1.570	0.657	0.561	0.485	0.415	0.343	0.243	0.227	0.185	0.144	0.120	0.103
	%V	61.12%	12.08%	5.05%	4.32%	3.73%	3.19%	2.64%	1.87%	1.74%	1.43%	1.11%	0.92%	0.79%
	%C	61.12%	73.20%	78.25%	82.57%	86.30%	89.50%	92.14%	94.00%	95.75%	97.17%	98.29%	99.21%	100.00%
ES	**T**	7.946	1.570											
	%V	61.12%	12.08%											
	%C	61.12%	73.20%											

Abbreviations: components (C); initial eighenvalues (IE); extraction sum of squared loadings (ES); total (T); percentage of variance (%); cumulative percentage (%).

The rotated component matrix revealed the specific talent skills linked to each factor, providing insights into the underlying dimensions of performance. This analysis is crucial for understanding how different skills contribute to overall athletic talent. By identifying these components, coaches and trainers can tailor their training programs to focus on the most impactful skills, thereby enhancing player development. Furthermore, recognizing the relationships between these factors can inform recruitment strategies, ensuring that young athletes with the potential for high performance are not overlooked. This comprehensive approach to analyzing talent variables is essential for fostering future excellence in sports (see Table 5).

Table 5. Rotated component matrix for the performance values.

	PC1 Development	**PC2 Disposition**
1. Interprets the coach's instructions correctly	−781	
2. Usually anticipates play	−829	
3. Generally, makes the right decision	−868	
4. Executes skills very quickly	−747	
5. Able to read the game clearly and quickly	−830	
6. Has good positional sense	−902	
7. Knows where their teammates are on the pitch	−809	
8. Makes an effort in matches and training		863
9. Keen to learn and develop		847
10. Able to concentrate in matches and training		
11. Possesses a winning mentality		
12. Has a positive attitude		786
13. Willing to take on responsibilities		

4. Discussion

The current research revealed that talent nomination does not show a significant relationship with anthropometric measurements. However, it does exhibit notable correlations with COD and lower-limb power. Specifically, the 505 COD test, Illinois Agility Test, and CMJ results were found to correlate with various skill-related questions, albeit with small to moderate effect sizes. Agility stands out as a critical skill in soccer, encompassing both physical attributes and cognitive responses to stimuli. A key aspect of agility is the capacity to swiftly change direction. The results from the 5-0-5 and Illinois tests were moderately correlated with player skills such as anticipating plays, executing skills rapidly, and effectively reading the game. While the ability to change direction alone does not define agility, it is often the case that players who excel in agility also demonstrate superior change-of-direction capabilities. This suggests that those identified as more talented in navigating the pace of the game are likely to perform better in change-of-direction tasks.

Agility is a crucial skill in soccer [34,35], encompassing both physical capabilities and cognitive responses to stimuli [23]. It involves the ability to swiftly change direction, which is a key factor in demonstrating agility [36]. The results from the 505 COD test and Illinois Agility Tests showed moderate correlations with player skills such as anticipating plays, executing actions quickly, and effectively reading the game. While simply being

able to change direction does not fully define agility, players who excel in this area often exhibit superior agility overall [37]. This suggests that those identified as more talented in managing the pace of the game are likely to perform better in change-of-direction tasks [38].

During a soccer match, players can engage in approximately 1400 actions, including around 1200 instances of acceleration and deceleration [39]. This highlights the importance of changing the direction for adapting to the dynamic nature of the game [40]. Quick information processing and reaction to environmental cues are essential, along with the physical attributes that enable effective performance [41,42]. Although COD time may not be the most precise measure of agility, it remains significant for enhancing player speed and their ability to integrate technical skills with rapid movements including turns and directional changes [43,44].

Moreover, the CMJ was also significantly (small-to-moderate magnitude) correlated with questions such as "anticipates play", "executes skills very quickly" "able to read game clearly and quickly", or "possesses winning mentally". The CMJ is one of the physical qualities highly correlated with COD performance [45]. Since being fast requires high neuromuscular activation and power [46], it is expectable that players with higher COD performance can be approximately the same with better CMJ values, which possibly justifies that they can be the same players with better nominations in talent values obtained. However, this fact can also disclose some of the issues related to talent identification and selection in youth. The tendency for selecting the fastest and the strongest is a typical bias at young ages [47], namely close to the peak height velocity in which the speed and power can be critical to playing better than teammates. This can be influenced by maturation and the nomination of plays by physical qualities, which can bring some issues related to the bias of selection [48], decreasing the focus on an equilibrium with other important factors such as tactical or technical skills and potential [49].

Interestingly, the study found that anthropometric measurements did not show significant correlations with talent identification questions, indicating that these physical attributes may not be as influential in assessing potential at younger ages. The participants were primarily in the pre-adolescent stage, far from reaching their peak height velocity, which typically occurs around the age of 14. This suggests that during the critical developmental years of 13 and 14 [50], talent identification may not be significantly affected by variations in height and body mass. As players approach their peak height velocity, the diversity in anthropometric characteristics becomes more pronounced, potentially leading to biases in judgment based on physical appearance rather than actual skill or talent.

The PCA conducted in this study demonstrated strong sample validity, with the KMO index ranging from 0.83 to 0.95. This analysis revealed two principal components with eigenvalues exceeding the Kaiser criterion of 1, together accounting for 73% of the total variance. The first component (PCA1) was associated with cognitive and tactical understanding, including attributes such as anticipating plays, making correct decisions, and possessing good positional awareness. This aligned with findings from Pino-Ortega et al. (2021) [51], who noted that PCA can effectively elucidate tactical and decision-making factors in sports. The second component (PCA2) was linked to psychological traits such as effort in training, eagerness to learn, and maintaining a positive attitude. According to Sarmento et al. (2018) [52], successful young athletes often exhibit high levels of commitment, discipline, resilience, and motivation. In fact, the actual literature has shown the influence of subjective perceptions and the efficacy of objective evaluation regarding the classification of soccer school players by their levels of performance. It is important to highlight that the current literature underscores the significant impact of both subjective perceptions and objective evaluations in the talent detection process for soccer school players. Subjective assessments, often shaped by the experiences and insights of coaches, play a crucial role in identifying potential talent. However, the present study objectified and improved the process of evaluating football talents [53]. In fact, another study by Jukic et al., 2019 [54] helped in understanding the differences in fundamental motor skills and specific conditioning capacities. This research provides empirical evidence that can inform coaches and

talent scouts about the key physical attributes that distinguish higher-performing players from their peers.

While these findings provide a robust framework for discussing the implications of talent identification and development, the study also faced limitations. The subjective nature of the questions used in the talent assessment raises concerns about the objectivity of the responses. Incorporating additional metrics, such as individual playing time and performance data, could enhance the criteria for talent selection. Furthermore, the study did not focus on the Change of Direction (COD) as a primary outcome, which could be a critical factor in evaluating athletic performance. Future research should also consider including technical skill assessments and aerobic fitness tests to provide a more comprehensive understanding of the factors influencing talent identification in young athletes. By addressing these limitations, subsequent studies can contribute to a more nuanced approach to talent development in sports.

5. Conclusions

Taking into account the existing literature, it is evident that certain attributes of the NSIFT questionnaire do not show significant correlations with anthropometric measures. However, there are notable correlations with various tests for COD. This finding underscores the importance of incorporating COD assessments into talent identification frameworks. The testing battery designed around COD not only facilitates the identification of talented players but also aids in pinpointing specific strengths and weaknesses within teams. The results from the PCA further support this approach. PCA revealed that cognitive and tactical understanding, as well as psychological attributes, are critical components of talent identification. By focusing on COD, talent identification programs can better align with these cognitive and tactical dimensions as agility and the ability to change direction are essential for effective gameplay. Moreover, integrating COD tests with physiological, genetic, and maturation-related factors can provide a more holistic view of a player's potential. This comprehensive approach allows coaches and talent scouts to make informed decisions based on a combination of physical capabilities and cognitive skills, ultimately enhancing the likelihood of identifying players who can succeed at higher levels of competition. By prioritizing these elements, talent identification programs can evolve to better predict future success in soccer, ensuring that promising athletes are not overlooked due to an overemphasis on anthropometric characteristics alone.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/app14177569/s1.

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Institutional Review Board Statement: The study was conducted in accordance with the ethical principles of the Helsinki Declaration for human research and was approved by the Research Ethics Committee of the University of Granada (nº 3882/CEIH/2023). After obtaining approval, the authors invited all the coaches of the team and families to a meeting in which we presented the objectives of the project and asked them to sign an informed consent form. Parents, teams responsible, and coaches were informed that they could revoke the participation agreement.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets generated during and analyzed during the current study are available from the aim author or the corresponding author on reasonable request.

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