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Is there a real physiological and technical-tactical difference between futsal and football? A preliminary study with under-13 football players

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ABSTRACT

Futsal has been explored as a potential developer of talent for 11-a-side football through the transfer of skills developed due to its constraints. This study examined the physiological and technical-tactical behaviours of fourteen young male football players (12.90 ± .36 years) during participation in two representative tasks designed to replicate the sport-specific environments. Participants performed six matches of 6v6 with a five-minute duration, interspersed with five minutes of passive recovery for both representative tasks in different sessions, with a familiarisation session for the futsal conditions. Technical and tactical data were recorded using a video camera and subsequently analysed using the Game Performance Assessment Instrument (GPAI) and the Movement Awareness and Technical Skill Instruments (MATS). Only two players per game used the Zephyr™ Bioharness, while all players reported a subjective perception of effort. The results for the comparison between representative tasks showed significant differences for the following variables: reception at first touch, pass at first touch, pass at first touch unsuccessful, unsuccessful pass, forward direction of the ball and side direction of the ball, showing a higher frequency of technical actions values for futsal than football. The results indicate that futsal could be a sport that promotes talent development for young football players.

KEYWORDS: development; talent; performance; skills; practice; soccer.

INTRODUCTION

The development of young talent has evolved in recent years, with players identified at increasingly young ages. Scouting teams, entrepreneurs, and sports agents seek to identify and capture young players for training academies, investing significant amounts of money in those athletes, providing them with the best conditions to develop their talent (Bennett et al., 2018; Ford et al., 2020; Sarmento et al., 2018; Williams & Reilly, 2000). However, in some cases, individual athletes are selected for talent development programs based on short-term current performance levels or based on coach perceptions of long-term potential (Mendes et al., 2022; Sarmento et al., 2018). In this sense, evidence suggests that predicting long-term success is difficult. The definition of talent itself has been one of the main constraints, as it lacks a consensual definition (Schorer et al., 2017). While talent can be recognized by several key indicators that can serve as a basis in trying to predict individuals who have the potential for future success, the process of talent identification, selection and development has many complex factors (Figueiredo et al., 2019; Helsen et al., 2005; Meylan et al., 2010; Práxedes et al., 2017; Towlson et al., 2021). Consequently, talent has been intensely discussed in the literature, with numerous models appearing over the years in an attempt to simplify the process of identifying and developing young athletes in the best training academies (e.g., see Coutinho et al.,

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2016). Several countries have even adapted their own talent development systems, such as England (League, 2011) and Germany (Grossmann & Lames, 2015), based, in part, on scientific evidence, especially the models identified by Gagné (2013), which have contributed significantly to the development process.

Football has been a sport where talent is often the focus of discussion, with the persisting idea that players are born with a natural talent for the sport, guaranteeing in advance that they will be able to express their attributes at the highest levels of the sport, neglecting the complex variables identified by some models (e.g., ecological dynamics theoretical approach) (Davids et al., 2013; Sarmento et al., 2018). In fact, Davids and Baker (2007) define the term "nature" as the innate and individual characteristics that contribute to the athlete's performance, highlighting the term "nurture" as the individual's experiences over time, thus resulting in qualities above average when compared to others.

Expertise in sport can then be seen as the interaction between the individual and their environment (Coutinho et al., 2016; Davids & Baker, 2007), and several models attempt to explain the development of athletes' expertise. However, the contribution of non-structured forms of the game (e.g., street football or other forms of deliberate practice) to talent development must also be acknowledged. In many cases, coaches seek to utilise or even recreate these unstructured environments to develop their own players (Ford et al., 2012).

Over the last few decades, several researchers have studied indicators that may explain the expression of talent by young players in team sports (Barraclough et al., 2022; Figueiredo et al., 2019; Pearson et al., 2006). Thus, indicators of young talented football players are often studied in athletes aged 12 years old or above, with fewer studies considering ages below 12 years (Saward et al., 2016; Saward et al., 2020). To examine potential in youth footballers, anthropometric factors (e.g., stature, body mass, body composition), technical-tactical (e.g., passing, dribbling, and shooting), physiological characteristics (aerobic, strength, power, or speed), and maturity (skeletal or somatic maturation), or relative age effect (RAE) can be examined. However, the individualistic and dynamic nature of these measures in predicting talent in football calls for a more ecological observation of players' potential, particularly their technical-tactical skills.

Furthermore, small-sided games (SSG) of different formats have been widely applied in the football context (Clemente & Sarmento, 2020). These formats have been primarily explored to improve the training process, as they represent the technical, physiological, and movement demands (Hill-Haas et al., 2011). The application of SSG in the football context has been explored holistically, including several factors. Research has examined the physiological benefits to performance, including the acute and chronic adaptations (Bujalance-Moreno et al., 2018). Further research has examined the technical impact of SSG, with researchers such as Clemente, Ramirez-Campillo et al. (2021) highlighting the importance of SSG for technical execution and the tactical behaviour adopted by young athletes in interventions involving these game formats. Effectively, these indicators may be a tool at the disposal of clubs and their respective technical teams, with the assumption that skills developed in SSG will transfer to larger-format versions (11v11).

In addition, the positive transfer of skills between sports such as futsal and football has been recently raised as an important topic among the scientific community owing to the potential implications for talent development and their complementarity (Oppici et al., 2017; Yiannaki et al., 2018b, 2018c). Studies have shown that many football players have futsal in their practice histories, especially in some geographical regions (Marques & Samulski, 2009; Rosa et al., 2009). According to Moore et al. (2018), the most successful nations in football are also successful in futsal, with some exceptions. The authors conclude that there is a general correlation (with some notable exceptions) between success in both sports and that there is currently no evidence to explain why this occurs. Consequently, there are elite players (e.g., Cristiano Ronaldo, Lionel Messi, Neymar or Andres Iniesta) who endorse the benefits of futsal and how it has helped them express their attributes (FIFA, 2012). There are also players who may experience futsal once or twice in their career, but some enjoy a complete twin-tracked approach, playing both futsal and football. For example, during the 2002 FIFA World Cup Korea Japan, at least 8 players on the Brazilian national team (which won the competition that year) had played futsal (Fonseca, 2007). It is becoming increasingly clear that futsal is a sport that can enrich and contribute to the development of young athletes' skills.

There is an urgent need for new approaches that effectively clarify how futsal can be a useful basis to support the transfer of skills for improved football performance, as postulated by Travassos et al. (2017). Following this line of thought, Oppici et al. (2017) and Yiannaki et al. (2018b) consider the hypothesis that futsal may be a sport that enhances talent through the acquisition of football-specific skills. Even some coaches have increasingly adopted the format of futsal in their methodologies, as well as perceiving that there is an optimal transfer of skills between sports (Yiannaki et al., 2018c). Given this context, the present preliminary study aimed to analyse the physiological and technical-tactical behaviours of a football team during participation in two representative tasks designed to replicate the sport-specific environments of football and futsal. Thus, this work aimed to examine the collective and individual behaviours in under-13 football players' during modified games, assessed by the tactical understanding demonstrated, the individual movements and technical skills. Furthermore, physiological and mechanical variables, such as heart rate, rating of perceived exertion or peak acceleration, were also assessed. This analysis can facilitate comparisons between the behaviours of futsal and football participants and reflect on coaching practices and strategies when developing youth football players' skills.

METHODS

Participants and procedures

Participants in this study were drawn from a successful youth club at the regional level. The club and its staff were informed about the nature of the study, including all data collection and analysis methods. Informed consent was then obtained from all players and their parents or guardians, who were notified about the objectives of the study and the methodological approach. Participants were also informed that their participation was voluntary and could be discontinued at any time. The study considered the standards of sports medicine and the recommendations of the Declaration of Helsinki (64th World Medical Association meeting, Fortaleza, Brazil, October 2013).

A total of 14 players (12.90 ± .36 years old; body mass: 44.81 ± 8.91 kg; height: 157.40 ± 8.88 cm) completed an experimental task during the sessions (Table 1), consisting of the completion of a modified game (5+GK x 5+GK) for 6 times, with a duration of 5 minutes and 5 minutes rest, allowing the players to rehydrate and time to recover. A fruitful and appreciated discussion was raised on some methodological issues related to the potential use of futsal as a skill development tool of the 11-a-side football match (see Oppici et al., 2019; Yiannaki et al., 2018a). Nevertheless, for the present study, two representative tasks were considered (Oppici et al., 2017) to observe and analyse the physiological and technical-tactical performance differences by manipulating the ball, rules, field surface, and individual area per player (IPA). The football task was performed with a regular-sized football (Adidas Tango Rosario) on a 24 m x 36 m synthetic turf, corresponding to an IPA of 86 m^2/player, which is currently representative of a football match (Fradua et al., 2013). The futsal task was performed with a regular

Table 1. Descriptive analysis of the sample (*n* = 14).

		Range		Mean			Standard deviation
		Minimum	Maximum	Value	SE	(95%CI)	
Chronological age	years	12.22	13.36	12.90	.10	(12.87–13.08)	.36
Age at PHV	years	13.00	15.06	14.30	.18	(13.92–14.67)	.66
Maturity Offset (Mirwald)	years	-2.31	.09	-1.43	.17	(-1.80 to -1.05)	.64
Maturity Offset (Moore)	years	-1.74	.03	-1.02	.13	(-1.29 to -0.74)	.48
PMH	%	83.31	93.84	87.24	.73	(85.66–88.82)	2.74
Sporting experience	years	4.00	12.00	7.50	.49	(6.44–8.56)	1.83
Football experience	years	4.00	9.00	6.71	.44	(5.77–7.66)	1.64
Deliberate practice	hours/week	.83	10.00	3.08	.67	(1.63–4.53)	2.51
Training practice	hours/week	4.50	4.50	4.50	.00	(4.5–4.5)	.00
Height	cm	144.10	172.50	157.40	.82	(152.27–162.53)	8.88
Sitting height	cm	72.70	88.60	78.56	1.23	(75.90–81.23)	4.62
Weight	kg	33.70	64.50	44.81	2.38	(39.67–49.96)	8.91
Σ Skinfolds	mm	34.60	74.70	49.41	2.84	(43.27–55.56)	10.64
Fat mass	%	9.90	21.10	14.96	.82	(13.19–16.73)	3.06
YYIRTL-1	m	400	1,200	700.00	66.93	(555.41–844.59)	250.42
VO_{2max}	ml/kg/min	39.76	46.48	42.28	0.56	(41.07–43.49)	2.10
HR_{max}	bpm	181	210	196.71	2.17	(192.03–201.40)	8.12

SE: standard error of the mean; 95%CI: 95% confidence intervals; PHV: peak height velocity; PMH: predicted mature height; YYIRTL-1: yo-yo intermittent recovery test - level 1; VO_{2max}: maximum oxygen volume; HR_{max}: maximum heart rate.

futsal ball (Adidas UEFA Euro 2016) on a 24 m x 15 m tar floor, corresponding to an IPA of 36 m^2/player, which is the most common density in futsal matches (Oppici et al., 2017).

An evaluation of anthropometric and maturational characteristics was conducted in the first session, along with the Yo-Yo IR1 test, to calculate each participant's HRmax. In the second session, players performed the football task. In the third session, players were familiarised with the futsal task, and in the fourth session, they performed it, consisting of six games (5+GK x 5+GK) (Figure 1). All games were recorded using a camera (Canon Legria HF R66) for post hoc analysis.

The interval between sessions was 7 days, and the 4 sessions were always held at the same time to avoid circadian effects. The temperature ranged from 21 to 32°C, and the humidity ranged from 22 to 79%. During the 4 sessions, all players performed a 10-minute warm-up (Bizzini et al., 2013). After the warm-up, the group was randomly divided into two teams of six players each, including the goalkeeper (5+GK x 5+GK), and the teams remained the same throughout the sessions.

Physiological performance

The physiological parameters, namely the maximum heart rate (HRmax), were monitored by heart rate monitors (Polar H10) to perform the yo-yo intermittent recovery test level 1. Yo-yo IR1 test protocol followed the recommendations of Castagna et al. (2009). The total distance covered by the young players and their HRmax were recorded (Impellizzeri et al., 2004). This test took place one week before the first session. The values obtained in this test were used as a reference to analyse the internal load through players' HR during the games. Throughout the completion of the two representative tasks, only one player from each team wore a differentiated waistcoat and used a ZephyrTM BioHarness (BH; Zephyr Technology Corporation, Annapolis, MD, USA). This wireless chest-based wearable system, capable of real-time, long-distance recording of a set of physiological and mechanical variables, has demonstrated reliability across several contexts (Johnstone et al., 2012; Nazari & MacDermid, 2020). In addition to monitoring physiological variables such as heart rate (HR), respiratory rate (RR), skin temperature, and peak acceleration, the rating of perceived exertion (RPE) for each player was collected using the Borg CR-10 scale. At the end of each game, during the rest period, each player was asked about his perception of effort during the game, and the data were recorded for analysis of players' physical responses.

Technical-tactical performance

Technical-tactical performance was evaluated using the Movement Awareness and Technical Skill (MATS) and the Game Performance Assessment Instrument (GPAI). The MATS (Larkin et al., 2017) is a valid analysis tool for the sport under study, presenting significant reliability in all its performance indicators, which takes into account 3 moments: decisions based on player movement (e.g. before receiving the ball and after contact with the ball), sequence of actions (e.g. first touch, running with the ball or pass) and the final result of the action (e.g. successful or unsuccessful pass, dribble or shot). This tool also provides a compass to facilitate the description and evaluation of the movements of the players and the ball, something that often fails in studies of this nature.

The GPAI - Game Performance Assessment Instrument (Oslin et al., 1998) was developed primarily to assess performance behaviours during the game that demonstrate tactical understanding, as well as the player's ability to solve and adapt to tactical problems by selecting and applying appropriate

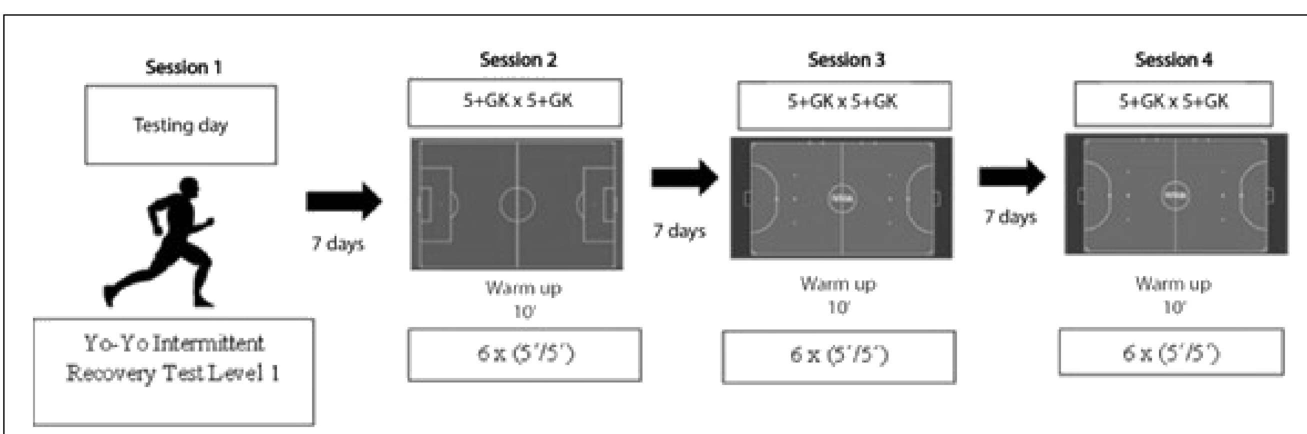

Figure 1. Organisation and planning of the experimental design adopted.

skills. It consists of seven components: two are evaluated when the player has the ball, and the remaining five when the player does not. For example, decisions made about what to do with the ball during the game, and motor skill execution were classified as appropriate/efficient or inappropriate/inefficient. This instrument has two main benefits: it can be used in many sports or sporting activities and can measure situations with and without the ball (Harvey et al., 2010). Therefore, the GPAI is not limited to the analysis of offensive components of the game, but also to defensive components, although these were not analysed in our study. Additionally, we calculated the indexes originally proposed by Oslin et al. (1998) such as: Game Involvement (GI = total appropriate responses + number of efficient skill executions + number of inefficient skill executions + number of inappropriate decisions made), Decision Made (DMI = number of appropriate decisions made + number of inappropriate decisions made), Motor Skill (SEI = number of efficient skill executions + number of inefficient skill executions, Support (SI = number of appropriate supporting movements + number of inappropriate supporting movements) and Game Performance (DMI + SEI + SI) / 3).

Statistical analysis

To assess data normality, the Shapiro-Wilk test was used. The T-test for paired samples and its non-parametric equivalent, the Wilcoxon test, were used to ensure intra- and inter-rater reliability. For analysing differences between the two samples, the T-test for independent samples and the Mann-Whitney test were used.

For statistical purposes the value of $p < .05$ was adopted, accompanied by the values of the Cohen's effect size (Cohen, 1988) considering the values .2 as small, .5 as medium, and .8 as large and for the non-parametric tests this interpretation was performed according to Rosnow and Rosenthal (1996): < .2 (insignificant); .2–.6 (small); .6–1.2 (moderate); 1.2–2.0 (large); 2.0–4.0 (very large); > 4 (extremely large). All data analyses were conducted using Microsoft Excel (Version 16.5, Microsoft Corporation, Redmond, WA, USA) and IBM SPSS Statistics (Version 27.0, IBM Corp., Armonk, NY, USA).

RESULTS

No differences were showed for intra-rater analysis in both the MATS and the GPAI, while inter-rater analysis revealed significant differences for shoot unsuccessful (Z = -2.485; p = .013; r = -.749; ICC = .000), first touch pass (Z = -2.131; p = .033; r = .643; ICC = .880), shoot successful (Z = -2.145; p = .032; r = -.647; ICC = .000), tackled (Z = -2.145; p = .032; r = -.647; ICC = .000), forward direction (Z = -2.375; p = .018; r = -.716; ICC = -.036) and stationary (Z = -4.216; p < .01; r = -1.271; ICC = -.468) in the MATS instrument. In future studies, reliability must be established before data are analysed (piloted), meaning that analysts are deemed accurate and have strong definitions of the variables used in games, as the noted differences were related to inconsistencies in the interpretation of the applied concepts.

The results showed significant differences between tasks for the technical variables: reception at first touch (Z = 2.293, p = .028, r = .662); first touch pass (Z = 2.688, p = .010, r = .776); first touch pass unsuccessful (Z = 2.858, p = .006, r = .825); pass unsuccessful (Z = 3.121, p = .003, r = .901); forward direction (Z = 2.144, p = .040, r = .619) and lateral direction (T = -2.988, p = .019, d = 1.743) showing higher values for futsal than for football.

No significant differences were found for physiological (Table 2) and tactical variables (Table 3), but large and medium effect sizes were obtained for the following physiological variables: maximum heart rate (T = .338, p = .739; d = 16.533), percentage of maximum heart rate (T = .141, p = .889, d = 6.690), respiratory rate (Z = -2.840, p = .070, r = -.820), Posture (T = 1.497, p = .148, d = 7.227), Vertical Peak (T = 1.460, p = .159, d = .244) and Lateral Peak (Z = -.911, p = .384, r = -0.263). For the variables measured by GPAI, no statistically significant differences were found but moderate effect sizes were detected: decision made appropriate (T = 1.620; p = .123; d = .707); motor skill execution efficient (T = 1.700; p = .106; d = .705); motor skill execution inefficient (T = 1.604; p = .126; d = 7.248; support appropriate (T = 1.138; p = .270; d = 9.629); game involvement (T = 1.307; p = .208; d = 42.604). On the other hand, the results of the comparison between tasks for the technical variables (Table 4) showed significant differences in first-touch control (Z = 2.293, p = .028, r = .662); first-touch pass (Z = 2.688, p = .010, r = .776); first touch pass unsuccessful (Z = 2.858, p = .006, r = .825); pass unsuccessful (Z = 3.121, p = .003, r = .901); forward direction (Z = 2.144, p = .040, r = .619) and sideways direction (T = -2.988, p = .019, d = 1.743), showing higher values for futsal than for football. Also, the variable shot unsuccessful (Z = 1.929, p = .065, r = .557) approached the previously established significance level (p < .05).

DISCUSSION

The field dimensions can influence the kinematic behaviours, in which more or less space to run or receive the ball and complete a pass can be influenced by the size of the pitch available in the exercise. If we consider the frequency of agility movements, the number of accelerations (ACC) and decelerations (DEC) becomes important to measure. These external load variables, particularly at high intensities, have been commonly associated with decreases in neuromuscular performance and indicators of muscle damage (Harper et al., 2019). Thus, studies show that football players perform a large number of high-intensity ACC (87 ± 49) and DEC (80 ± 32) actions (Spyrou et al., 2020). As far as football is concerned, a review study with meta-analysis indicated a prevalence of high-intensity DEC during football games (Harper et al., 2019), with studies reporting mean ACC (16 ± 9) and DEC (46 ± 17) demands during competitive match play. Therefore, frequent agile actions are considered decisive in team sports, allowing players to change direction pace in response to the actions of their opponents, generating space and goal opportunities, particularly in futsal (Loturco et al., 2022) due to the space constraints.

On the other hand, the physical demands (e.g., heart rate) in elite football are generally higher than those in futsal (Spyrou et al., 2020) when the field dimension was large, both in absolute (eight to fifteen times) and relative terms (per player; four to eight times) compared to medium or small fields keeping the number of players equivalent in both teams (Clemente et al., 2014; Rampinini et al., 2007), which is also revealed in the present study. Furthermore, studies stressed that internal loads tend to be

Table 2. Results of physiological and mechanical variables between football (n = 12) and futsal (n = 12) tasks.

	Football		Futsal		*P*-value	95%CI of the difference in means (Football - Futsal)	Effect size
	Mean ± SD	CV (%)	Mean ± SD	CV (%)			
Heart Rate %	151.58 ± 18.12	11.95	149.30 ± 14.78	9.90	.739	(-11.7–16.3)	*d* = 16.533
Heart Rate %	76.22 ± 7.20	9.45	75.84 ± 6.14	8.10	.889	(-5.3–6.1)	*d* = 6.690
Respiratory Rate	32.56 ± 7.74	23.77	26.50 ± 2.83	10.68	.070	(1.0–6.8)	*r* = -.820
Activity	.51 ± .15	29.41	.54 ± .13	24.07	.664	(-.2–.1)	*r* = .131
Peak Acceleration	1.32 ± 0.42	31.82	1.37 ± . 36	26.28	.603	(-.4–.2)	*r* = .157
Posture	-1.72 ± 6.64	-386.05	2.69 ± 7.77	288.85	.148	(-10.6–1.7)	*d* = 7.227
Vertical peak	-.27 ± .21	-77.78	-.12 ± .28	-233.33	.159	(-.4–.1)	*d* = .244
Lateral peak	.32 ± .06	18.75	.31 ± .08	25.81	.384	(-.1–.1)	*r* = -.263
Sagittal peak	.68 ± .15	22.06	.71 ± .15	21.13	.526	(-.2–.1)	*d* = .149
Core Temperature	37.78 ± .17	.45	37.70 ± .15	.40	.208	(-.1–.2)	*d* = .159
RPE	3.67 ± 1.93		1.50 ± .91		.002*	(.9–3.4)	*d* = 1.503

RPE: rating of perceived exertion; $^*p < .05$.

Table 3. Collective Analysis (GPAI) between football (n = 10) and futsal (n = 10) tasks.

	Football		Futsal		*p*-value	95%CI of the difference in means (Football - Futsal)	Effect Size
	Mean ± SD	CV (%)	Mean ± SD	CV (%)			
Decision Made – Appropriate	24.90 ± 10.98	44.10	34.20 ± 14.45	41.37	.123	(-1.6–.2)	*d* = 12.833
Decision Made – Inappropriate	11.10 ± 5.13	46.22	12.30 ± 7.56	61.46	.970	(-4.0–7.0)	*r* = .010
Motor Skill execution – Efficient	21.20 ± 10.54	49.72	30.30 ± 13.24	43.70	.106	(-1.7–.2)	*d* = 11.967
Motor Skill execution – Inefficient	13.00 ± 6.65	51.15	18.20 ± 7.80	42.86	.126	(-1-6–.2)	*d* = 7.248
Support – Appropriate	16.19 ± 7.95	49.10	21.00 ± 11.06	51.67	.270	(-1.4–.4)	*d* = 9.629
Support – Inappropriate	2.10 ± 2.42	115.24	0.40 ± 0.52	130	.062	(-4.0–.0)	*r* = .540
Game Involvement	88.40 ± 32.69	36.97	113.30 ± 50.61	44.66	.208	(-15.1–64.9)	*d* = 42.604
Decision Made Index	2.45 ± 1.12	45.71	3.51 ± 2.32	66.09	.450	(-.8–3.0)	*r* = .218
Motor Skill Index	1.98 ± 1.57	79.29	1.71 ± 0.68	39.76	.650	(-.7–.9)	*r* = .131
Support Index	5.85 ± 7.71	131.79	8.10 ± 12.10	149.38	.751	(-4.6–10.0)	*r* = .09
Game Performance	3.43 ± 2.22	64.72	4.44 ± 4.00	90.09	.880	(-1.8–5.0)	*r* = .04

$^*p < .05$.

greater when using smaller game formats (i.e., fewer players), larger fields, limitations imposed on touches, special defensive requirements, or rules (e.g., man-to-man marking) and regular encouragement (Casamichana & Castellano, 2010; Clemente, Afonso et al., 2021). This is in line with the results obtained in this study, in which we found that the mean and effect sizes of mean heart rate, percentage of maximum heart rate had higher values for the football task compared to the futsal task, and the subjective perception of exertion showed statistically significant differences, suggesting that a larger space may result in greater intensity, reflected in an increase in mean heart rate.

The variables that showed significant differences are important for player development, with ball reception and passing showing higher values during the futsal task. We speculate that this is because the available space and the Individual Player Area (IPA) present a task constraint which contrasts with football, providing affordances in ball retention under high pressure and subsequent ball manipulation and passing skills. In addition, the variable of pass direction (forward and sideways, respectively) was significant because the interaction between team members is vital to progress and ultimately score goals (Grund, 2012; Rein et al., 2017). As recently evidenced by Bergmann et al. (2022), when the number of players is reduced in the game format, the frequency of use of multiple technical variations tends to increase. The results obtained in our study are in line with those of the aforementioned studies, in which higher mean values were observed for appropriate decision made (34.20 ± 14.45) and inappropriate decision made (12.30 ± 7.56) in the futsal task, compared to the football task (24.90 ± 10.98) and (11.10 ± 5.13), respectively. Thus, the smaller the IPA, the greater the challenge in decision-making (e.g., the player will have less time to decide and, therefore, the decision must be processed more quickly for a successful response).

Regarding the importance of skill execution, a study by Yiannaki et al. (2018c) assessed coach perceptions, with approximately 90% reporting that smaller fields can enhance

Table 4. Individual Analysis (MATS) between football (n = 12) and futsal (n = 12) tasks.

	Football		Futsal		*p*-value	95%CI of the difference in means (Football - Futsal)	Effect size
	Mean ± SD	CV (%)	Mean ± SD	CV (%)			
FTCs	2.18 ± 1.83	83.94	4.17 ± 2.69	64.51	.028*	(-4.0–.0)	*r* = .662
FTC*uns*	.09 ± .30	333.33	.42 ± .79	188.1	.515	(.0–.0)	*r* = .197
FTPs	.45 ± .69	153.33	1.58 ± 1.38	87.34	.010*	(-2.0–.0)	*r* = .776
FTP*uns*	.00 ± .00	.00	.83 ± 1.03	124.1	.006*	(-1.0–.0)	*r* = .825
FTSs	.36 ± .51	141.67	.33 ± .49	148.48	1.000	(.0–.0)	*r* = .000
FTS*uns*	.27 ± .65	240.74	.17 ± .39	229.41	.929	(.0–.0)	*r* = -.027
Ps	1.64 ± 1.63	99.39	2.25 ± 1.55	68.89	.205	(-2.0–1.0)	*r* = .382
P*uns*	.18 ± .41	227.78	1.42 ± 1.24	87.32	.003*	(-2.0–.0)	*r* = .901
Ss	.00 ± .00	.00	.00 ± .00	.00	1.000	(.0–.0)	*r* = .000
S*uns*	.00 ± .00	.00	.42 ± .52	123.81	.065	(-1.0–.0)	*r* = .557
RBs	.82 ± 1.08	131.71	1.08 ± 1.17	108.33	.602	(-1.0–1.0)	*r* = .157
RB*uns*	.18 ± .60	333.33	.17 ± .39	229.41	.615	(.0–.0)	*r* = .152
EOs	.55 ± .82	149.09	.83 ± .84	101.20	.278	(-1.0–.0)	*r* = .327
EO*uns*	.18 ± .41	227.78	.33 ± .49	148.48	.356	(.0–.0)	*r* = .278
T	.00 ± .00	.00	.33 ± .49	148.48	.140	(.0–.0)	*r* = .445
IB	.91 ± 1.14	125.27	1.00 ± .95	95.00	.688	(-1.0–1.0)	*r* = .121
F	.91 ± .83	91.21	1.75 ± .97	55.43	.040*	(-2.0–.0)	*r* = .619
B	.55 ± 1.21	220.00	1.25 ± 1.49	119.20	.086	(-2.0–.0)	*r* = .518
S	1.08 ± 1.0	91.21	3.08 ± 2.28	74.03	.019*	(-3.49 to -0.51)	*d* = 1.743
Sta	.27 ± .47	174.07	.17 ± .39	229.41	.623	(.0–.0)	*r* = -0148

FTCs: first touch control successful; FTC*uns*: first touch reception unsuccessful; FTPs: first touch pass successful; FTP*uns*: first touch pass unccessful; FTSs: first touch shot successful; FTP*uns*: first touch shot unssuccessful; Ps: pass successful; P*uns*: pass unssuccessful; Ss: shot successful; S*uns*: Shot unssuccessful; RBs: running with the ball successful; RB*uns*: running with the ball unsuccessful; EOs: evade opponent successful; EO*uns*: evade opponent unsuccessful; T: tackled; IB: interception ball; F: forward direction; B: backward direction; S: side direction; Sta: Stationary; *p < .05.

ball control/manipulation skills and the accuracy of passes. Results in this study support these perceptions, showing that average success rates were higher in the futsal task compared to the football task. As such, results suggest that futsal could augment talent development in the development of many skills useful for football, as some researchers have previously proposed (see Oppici et al., 2017, and Yiannaki et al., 2018c). Therefore, incorporating futsal into coaching methodologies could enhance the development of technical football skills. Futsal represents an SSG format that, in many cases, is easy to deliver, closely resembles the 11x11 format, and promotes deliberate play.

In addition to technical skills, futsal seems to be a format that stimulates decision-making and skill execution in football players, as the reduced field dimensions challenge players to think and execute much faster, with immediate feedback on success/failure. A recent study performed with professional football players highlighted the association between deliberate practice in futsal and offensive decision-making skills with the ball and near the ball (Machado et al., 2023). According to our study, players are more often involved in the futsal task (113.30 ± 50.61) than in the football task (88.40 ± 32.69), as indicated by the large effect size (d = 42.604). This alludes to the importance of manipulating task constraints on the emergence of individual behaviours. Thus, from our preliminary results, we can suggest that futsal is a sport that has the potential to enhance talent among football players' because they experience more frequent involvement/repetitions with authentic practice conditions offering realistic technical-tactical affordances, i.e., more involvement and repetition can provide affordances to practice technical-tactical skills in an authentic practice environment.

Limitations and cautions in generalisations must be recognised in the present study, as we sought to examine the potential for transfer and acquisition of football-specific skills. Future studies should now evaluate all the variables analysed in this research in a futsal sample and compare them with the results obtained in this study, with the possibility of effectively validating the hypothesis raised by Yiannaki et al. (2018b). Furthermore, the IPA can be highly variable due to the dynamic and changeable nature of the strategic demands in an 11-aside format or even the age-related rules and formats (Yiannaki et al., 2018a). Additionally, future research should include futsal players and larger samples to determine and examine the similarity effects of futsal skills on young football players.

As for practical implications, our results suggest that coaches could adopt futsal as a training methodology in their academies to develop individual players' skills and identify potential talent. Even at a team level, coaches should be aware that futsal seems to be an effective tool for developing and stimulating decision-making and skill execution in young footballers, as its reduced size promotes quick thinking and faster skill execution. The process of player learning and development involves modifying individual behaviours through interaction with personal, environmental, and task constraints, dependent on existing experience, following the Constraint-Led Approach model (Wood et al., 2022). Thus, the individual tends to "self-organise in attempts to generate effective movement solutions" (Renshaw & Chow, 2018). Futsal provides 'affordances' to players, who, over time, become 'attuned' to these 'affordances', adapting their behaviours to the constraints in a process in which 'perception and action' are directly associated. Over time, players learn new behaviours through the effective management of task constraints, leading to a search dynamic that provides important intrinsic feedback, which is essential for the tendency towards self-organisation in finding solutions to game-related problems (Otte et al., 2020). Coaches should be familiar with these approaches to facilitate athletes' self-regulation in sport performance/development, though several other learning approaches can also provide effective coaching methodologies and activities.

CONCLUSIONS

The results of the present study indicate that futsal is a sport with the potential to promote and enhance talent development in young football players and could be integrated into the training methodologies of sports institutions, particularly to enhance common sport-specific skill actions and decision-making. However, one should be aware of the behavioural and physiological differences between the two sports, which can impact a player's individual development.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Bernardo Viveiros — Conceptualization; Methodology; Software; Formal Analysis; Resources; Writing – Original Draft.

Ricardo Rebelo-Gonçalves — Conceptualization; Methodology; Writing – Review and Editing; Visualization; Data Curation; Supervision; Project Administration.

Ruben Santos — Methodology; Investigation; Resources.

Hugo Sarmento — Writing – Review and Editing.

Christopher Yiannaki — Conceptualization; Validation; Writing – Review and Editing.

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