A Comparison of Physical Abilities and Match Performance Characteristics Among Elite and Subelite Under-14 Soccer Players

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This study aimed to identify characteristics of match performance and physical ability that discriminate between elite and subelite under-14 soccer players. Players were assessed for closed performance and movement, physiological responses, and technical actions during matches. Elite players covered more total m·min⁻¹ (115.7 ± 6.6 cf. 105.4 ± 7.7 m·min⁻¹) and high-intensity m·min⁻¹ (elite = 14.5 ± 2.3 cf. 11.5 ± 3.7 m·min⁻¹) compared with subelite players. Elite players also attempted more successful (0.41 ± 0.11 cf. 0.18 ± 0.02) and unsuccessful ball retentions·min⁻¹ (0.14 ± 0.04 cf. 0.06 ± 0.02) compared with subelite players. Elite players were faster over 10 m (1.9 ± 0.1 cf. 2.3 ± 0.2 s) and faster dribblers (16.4 ± 1.4 cf. 18.2 ± 1.1 s) compared with subelite players. Speed (10 m) and successful ball retention·min⁻¹ contributed to a predictive model, explaining 96.8% of the between-group variance.

The identification of young talented soccer players is traditionally a subjective process, whereby scouts and sports coaches are responsible for recognizing players with the capacity to perform at the elite level (19,25). However, talent identification in soccer is complicated by the growing number of participants and the vague concept of “talent” in team sports (13). More recently, the merits of integrating physical testing procedures into the talent identification process have been recognized. For example, it has been shown that under-14 Flemish youth players contracted to first or second division teams (elite), are faster over 30 m and perform better in dribbling and ball juggling skill tests than players competing at a regional level (nonelite; 24). However, compared with players of a higher standard (third and fourth division; subelite), there were no differences in speed, skill, agility or endurance until the under-16 age group (24). These results are consistent with research in French soccer, where a retrospective comparison between players reaching the international, professional, or amateur standard found no differences in physical performance in the under-14 age group but did report greater anaerobic power in the under-16 age group (15). Collectively, research on under-14 players indicates that tests of closed performance do not distinguish between elite or subelite groups. In English-based
youth soccer, research of this type is limited to the under-16 age group, whereby
gility, speed, and skill have been recognized as significant predictors of talent (21).
However, there has been no study to compare English under-14 players of elite and
subelite status. Therefore, a comparison of higher and lower standard English-based
soccer players at the under-14 age group is warranted.

A limitation of research in the area of talent identification is the absence of
performance assessment from within the competitive environment (9,25). Recent
advancements, such as the introduction of Global Positioning Systems (GPS) and
its integration with heart rate telemetry, has made it possible to monitor the physi-
cal and physiological responses of players during competitive matches. However,
only one study has investigated the match activity profiles of elite and subelite
youth players (23). While Strøyer et al. found that the elite youth Danish players
covered more distance at higher intensities during match play, their comparisons
were restricted to players at prepubescent ages (~12 years) and were carried out
using less valid time-motion-analysis techniques (20). The analysis of match
performance may be an important progression for research in talent identification
since it is unclear whether the inability to distinguish between elite and subelite
soccer players of the under-14 age group is limited by the closed nature of the tests
employed (9,25). Furthermore, analysis of the movement patterns, game-specific
skills, and physiological responses of under-14 soccer players would address the
current paucity of research on match performance in youth soccer. Therefore, the
aim of this study was to identify which aspects of match performance and physical
abilities best discriminate between elite and subelite soccer players.

Methods

Participants and Design

The participants were recruited from two separate under-14 youth squads, com-
peting at different levels in the UK (England). The first squad of players were
sampled from an “elite” English Premiership soccer Academy ($n=15$; age = 14.1
± 0.3 y; stature = 167.8 ± 8.4 cm; body mass = 58.1 ± 7.3 kg) and the second from
a ‘subelite’ English Division 1 Centre of Excellence ($n=16$; age = 14.0 ± 0.3 y;
stature = 165.6 ± 8.3 cm; body mass = 56.3 ± 8.7 kg). The English First Division
is two leagues below the English Premiership, thereby categorizing players of this
club as ‘subelite’. Written consent was obtained from the players, parent/guardi-
rians, clubs, and the national governing bodies. Institutional ethical approval was
granted for this study.

Each player was analyzed for their average match-related performance over
a minimum of two and a maximum of five competitive matches, which included
measurements of technical skill, heart rate, perceptual responses, and movement
demands. A total of 52 (five matches) and 50 (five matches) performances were
analyzed for the elite and subelite team, respectively. Only players completing more
than 75% of each match were included in the study (2). In accordance with the
guidelines of the Football Association, matches were intended to last for 75 min (2
× 25 min periods, followed by 2 × 12.5 min periods). However, mean match time
was 77.5 ± 2.1 min, comprising a first (25.5 ± 0.9 min), second (24.6 ± 3.2 min),
third (13.1 ± 2.1 min) and fourth interval (12.8 ± 2.1 min). Continuous substitu-
ations were permitted during all of the matches. Of the five elite matches analyzed, two were won, one was drawn, and two were lost, with a mean goal difference of zero. Of the five subelite matches analyzed, two were won, two were drawn, and one was lost, with a mean goal difference of one. Matches took place on a grass pitch (65 m × 99 m) against teams of an equal competitive level (i.e., Academy or English Division 1) at evenly distributed periods between December and April. Given the nature of the current comparison between two teams, comprising an equal compliment of positional groups (i.e., defenders, midfielders, attackers), it was not deemed necessary to subcategorize players by position.

During the first month of the season, the players from each club were assessed for various dimensions of closed performance (see following). For each team of players, all tests took place in the same order and on the same day on an outdoor AstroTurf surface. Testing was administered by the same investigator and performed in dry conditions with a mean temperature of $9.2 \pm 2.4 ^\circ C$. The participants performed a familiarization and warm-up before each test. The warm-up included moderate-intensity running and dynamic stretching routines. A 20-min rest was given to players in between tests.

**GPS Movement Analysis**

Using portable GPS devices (SPI-Pro; 5Hz, GPSports, Canberra, Australia) integrated with an in-built 6 g triaxial accelerometer (100 Hz), players were assessed for various dimensions of movement during matches. All of the matches took place between the times of approximately 11 a.m. and 3 p.m. at the home ground of either the elite or the subelite club. For all matches throughout the testing period, a mean of $9 \pm 1$, ranging between 6–12 satellites were determined as available for signal transmission using Team AMS software, which is the same as previously reported for optimal use of GPS technology for assessment of human movement (14). The mean horizontal dilution of precision (HDOP) was $1.44 \pm 0.52$ for all recorded matches, thus providing near optimal geometrical positioning of orbiting satellites (14,27). The mean temperature for all matches was $9.4 \pm 4.7 ^\circ C$.

During data collection, all GPS units (maximum of sixteen per match) were simultaneously activated at pitch side approximately fifteen minutes before the warm-up period. Players were prefitted with an appropriately sized vest, housing the portable GPS unit between the scapulae. The GPS device was fitted to the vest of the player upon entering the field for the warm-up. The raw GPS data files were synchronized to the start and end of each match period, as signaled by the referee. All data were downloaded to a computer using SPI Ezy V2.1 and analyzed using Team AMS V2.1 software (GPSports, Canberra, Australia).

Movement variables were restricted to whole-match analyses, comprising; total distance covered relative to playing minutes (m·min⁻¹), and relative distance within four speed categories (Zones 1–4) that were based upon previous analyses of under-14 soccer players (3). Zone 1 (low intensity movement; LIM m·min⁻¹) < 6 km·h⁻¹, Zone 2 (medium intensity movement; MIM m·min⁻¹) = 6.1–13 km·h⁻¹, Zone 3 (high intensity movement; HIM m·min⁻¹) = 13.1–19 km·h⁻¹ and Zone 4 (very high intensity movement: VHIM m·min⁻¹) > 19.1 km·h⁻¹. Previous analyses have shown moderate to good reliability for distance covered (3–9% Coefficient of Variation; CV) using a similar demarcation of zones (18). The mean sprint
distance (m), sprints per minute (sprints·min⁻¹), maximum sprint distance (m) and peak sprint speed (km·h⁻¹) were also assessed during matches.

**Heart Rate and Ratings of Perceived Exertion**

Heart rate (HR) was recorded during matches using a HR monitor (Polar Electro, Oy, Finland) and was secured to the participant using Hypafix tape. The mean HR of each player was expressed relative to their peak heart rate (bpm) obtained during a match (%HRpeak). Twenty minutes postmatch, players were asked to provide a rating of perceived exertion (RPE) for the match using the 0–10 scale (10).

**Game-Specific Skill Analysis**

The matches were recorded from a 3-m elevation on the halfway line. The footage was later analyzed using a behavioral recognition system (Dartfish TeamPro, 4.0.9.0, Switzerland). The frequency of game-specific skills were recorded postmatch and expressed per minute of playing time. These included successful and unsuccessful outcomes of; passing (successful passes·min⁻¹ and unsuccessful passes·min⁻¹), ball retention (successful ball retention·min⁻¹ and unsuccessful ball retention·min⁻¹) and tackling (successful tackling·min⁻¹ and unsuccessful tackling·min⁻¹). All of the game-specific skills were noted by the same observer and were predefined for consistency. For example, successful ball retention was defined as the “controlled possession of the ball by the analyzed player, requiring more than one touch of the ball, without relinquishing the ball to the opposition.” For the purpose of reliability, the researcher analyzed one entire match on two occasions, separated by one week. Adopting the method presented by Cooper et al. (6), no systematic bias (p > .05) was demonstrated between trials, with all values agreeing within the range of plus or minus one. These results indicate acceptable intraobserver reliability in the context of the current analysis.

**Sprinting Speed**

The protocol consisted of two maximal sprint efforts, starting from a standing position, separated by a period of three minutes of recovery. The sprinting course was marked with a premeasured (tape measure) straight painted line, upon which timing gates were positioned at 10 m and 30 m. At each interval, timing gate height was set at 60 cm (7). On both occasions, participants were instructed to start sprinting from 30 cm behind the first timing gate, from their preferred foot, until they reached the cone placed 35 m away. Split times were recorded at 10 m and 30 m from a wireless receiver (Brower timing systems, Utah, USA) accurate to 0.01 s. The best time performed by participants over each interval was recorded for statistical analysis. The CV% for sprinting times over 10 m and 30 m was 1.1% and 1.4%, respectively.

**Slalom Run Agility Test**

Beginning at a start line, the players were instructed to travel between a set of nine cones (approximately knee height), linearly placed at 2 m intervals, before moving back through the same set of cones to the starting position (also the end line; Figure 1).
The players were instructed to “zigzag” between the cones, alternating from left to right, in the fastest possible time. Split times were recorded using infrared timing gates (Brower timing systems, Utah, USA) positioned at the start/end line of the course. The best time performed over two trials was recorded. The CV of the agility protocol was 3.3% indicating good reliability. Slalom agility run tests have been previously validated in junior soccer players (22).

**Slalom Dribble**

A slalom dribble test was conducted using the course presented in Figure 1, requiring participants to dribble the ball through a series of nine cones, linearly positioned every two meters, and then return back to the beginning (18 m total) as fast as they can (24). Players dribbled the ball through the cones using either foot in the quickest possible time. Split times were measured using infrared timing gates set at the start/finish line. Three trials were performed by each participant, separated by a period of approximately ten minutes rest, during which players continued to perform warm-up type activities, excluding any contact with a soccer ball. Players were not informed of any their scores until the three trials were completed. The best time across three trials was recorded. The reliability of the slalom dribble test was 7.3% (CV).

**Cone Passing Test**

A set of five target cones (numbered 1–5) were set 2.5 m apart along a straight line, with the participant stood central to the middle cone at a distance of 9 m from the target line. The objective was to hit the designated targets with each kicked ball, beginning at target 1 and ending at target 5. The score was determined by the number of successful target hits, with one point awarded for each. Two attempts at each target were required, alternating the foot on each occasion, totaling 10 attempts (maximum score = 10 points). This procedure was repeated three times, separated
by approximately 10 min, during which players continued to perform warm-up type activities (see previous) excluding any contact with a soccer ball. The best score achieved across three trials was recorded. Notwithstanding the ability of players to calculate their own cumulative score in the tests, they were not informed of the recordings of any previous scores until the three trials were completed. The test retest reliability of the cone-passing test was 7.8% (CV). Previous research has demonstrated an intraclass correlation coefficient of 0.70 for an identical testing procedure (16).

**Assessment of CMJ Jump Height and Predicted Power**

Maintaining a stance at shoulder width, participants flexed their knees in a rapid downward motion, reaching approximately 90°, before rapidly extending their knees and driving in an upward motion to complete the jump. The participants performed three jumps with the highest jump used for analysis. CMJ height (cm) was calculated as the difference between landing and take-off time recorded using a timing mat system (Just Jump System, Probotics Inc., Huntsville, AL). Vertical Power (W) was estimated based on the equation of Harman et al. (12); CMJ power \( W = 61.9 \times \text{jump height (cm)} + 36.0 \times \text{body mass (kg)} - 1822 \). The equation of Harman and colleagues was selected since reports have demonstrated no systematic difference to power recorded on a force platform (4). Reliability of the CMJ height was 2.4% (CV).

**Statistical Analysis**

Independent \( t \) tests were performed with competitive standard (elite vs. subelite) as the between-group factor. All of the dependent variables were included in the analysis and significance was set at \( p < .05 \). A follow-up stepwise discriminant function analysis was conducted with competitive standard (elite and subelite) as the dependent variable. All of the outcome measures previously identified were considered as predictor variables. The significance of \( F \) for entry into the model set at 0.05 and removal at 0.1. Statistical tests were carried out on SPSS version 19.

**Results**

The results showed significant effects of competitive standard for \( \text{m\cdotmin}^{-1} \), LIM \( \text{m\cdotmin}^{-1} \), and HIM \( \text{m\cdotmin}^{-1} \), in favor of the elite players (Table 1). The elite players also performed significantly more successful passing \( \text{min}^{-1} \), more unsuccessful passing \( \text{min}^{-1} \), more successful ball retention \( \text{min}^{-1} \), more unsuccessful ball retention \( \text{min}^{-1} \), more successful tackling \( \text{min}^{-1} \) and more unsuccessful tackling \( \text{min}^{-1} \) (Table 1). However, there were no effects of competitive standard on RPE or \%HRpeak. Similarly, there were no differences found between elite and subelite players for average sprint distance, maximal sprint distance, or sprint \( \text{min}^{-1} \).

There were significant differences between elite and subelite players for 10 m and 30 m sprint time, agility, the slalom dribble and predicted vertical power each in favor of the elite group (Table 1). No differences were observed for the CMJ or the cone-passing test.
<table>
<thead>
<tr>
<th></th>
<th>Elite ($n = 15$)</th>
<th>Subelite ($n = 16$)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total m·min$^{-1}$</td>
<td>115.7 ± 6.6</td>
<td>105.4 ± 7.7*</td>
<td>0.001</td>
</tr>
<tr>
<td>LIM m·min$^{-1}$</td>
<td>46.5 ± 4.5</td>
<td>42.4 ± 3.8*</td>
<td>0.039</td>
</tr>
<tr>
<td>MIM m·min$^{-1}$</td>
<td>51.2 ± 3.0</td>
<td>48.3 ± 7.1</td>
<td>0.272</td>
</tr>
<tr>
<td>HIM m·min$^{-1}$</td>
<td>14.5 ± 2.3</td>
<td>11.5 ± 3.7*</td>
<td>0.032</td>
</tr>
<tr>
<td>VHIM m·min$^{-1}$</td>
<td>3.4 ± 0.7</td>
<td>3.2 ± 1.4</td>
<td>0.068</td>
</tr>
<tr>
<td>Sprints·min$^{-1}$</td>
<td>0.4 ± 0.2</td>
<td>0.4 ± 0.2</td>
<td>0.254</td>
</tr>
<tr>
<td>Mean sprint distance (m)</td>
<td>8.7 ± 4.3</td>
<td>6.5 ± 1.7</td>
<td>0.115</td>
</tr>
<tr>
<td>Peak sprint distance (m)</td>
<td>31.4 ± 9.7</td>
<td>27.1 ± 7.3</td>
<td>0.129</td>
</tr>
<tr>
<td>Peak speed (km·h$^{-1}$)</td>
<td>26.8 ± 4.3</td>
<td>25.8 ± 2.2</td>
<td>0.260</td>
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<tr>
<td>Successful ball retention·min$^{-1}$</td>
<td>0.41 ± 0.11</td>
<td>0.18 ± 0.02*</td>
<td>0.000</td>
</tr>
<tr>
<td>Unsuccessful ball retention·min$^{-1}$</td>
<td>0.14 ± 0.04</td>
<td>0.06 ± 0.02*</td>
<td>0.000</td>
</tr>
<tr>
<td>Successful passes·min$^{-1}$</td>
<td>0.47 ± 0.19</td>
<td>0.21 ± 0.08*</td>
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<tr>
<td>Unsuccessful passes·min$^{-1}$</td>
<td>0.18 ± 0.06</td>
<td>0.07 ± 0.03*</td>
<td>0.000</td>
</tr>
<tr>
<td>Successful tackling·min$^{-1}$</td>
<td>0.39 ± 0.13</td>
<td>0.18 ± 0.07*</td>
<td>0.001</td>
</tr>
<tr>
<td>Unsuccessful tackling·min$^{-1}$</td>
<td>0.14 ± 0.06</td>
<td>0.06 ± 0.02*</td>
<td>0.000</td>
</tr>
<tr>
<td>%HRpeak</td>
<td>86.7 ± 2.4</td>
<td>83.8 ± 3.5</td>
<td>0.051</td>
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<tr>
<td>RPE (0–10)</td>
<td>4.9 ± 2.1</td>
<td>4.97 ± 1.0</td>
<td>0.504</td>
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<tr>
<td>10-m sprint time (s)</td>
<td>1.9 ± 0.1</td>
<td>2.3 ± 0.2*</td>
<td>0.000</td>
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<td>30-m sprint time (s)</td>
<td>4.3 ± 0.1</td>
<td>5.1 ± 0.2*</td>
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<td>CMJ jump height (cm)</td>
<td>41.1 ± 4.4</td>
<td>40.7 ± 4.3</td>
<td>0.393</td>
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<tr>
<td>Predicted vertical power (W)</td>
<td>2816.2 ± 414.7</td>
<td>2759.5 ± 382.5*</td>
<td>0.000</td>
</tr>
<tr>
<td>Slalom dribble (s)</td>
<td>16.4 ± 1.4</td>
<td>18.2 ± 1.1*</td>
<td>0.039</td>
</tr>
<tr>
<td>Cone passing test (n)</td>
<td>4.7 ± 1.3</td>
<td>4.2 ± 1.5</td>
<td>0.378</td>
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<td>Slalom agility (s)</td>
<td>10.3 ± 0.5</td>
<td>11.6 ± 1.4*</td>
<td>0.043</td>
</tr>
</tbody>
</table>

Note. Match analyses were based on 52 (elite) and 50 performances (subelite). LIM = low intensity movement; MIM = medium intensity movement; HIM = high intensity movement; VHIM = very high intensity movement. * Significantly different compared with the elite group ($P < 0.05$).
The stepwise discriminant function analysis revealed that a combination of six variables would successfully discriminate between elite and subelite players, explaining 96.8% of the between group variance (canonical coefficient = 0.984). As presented in Table 2, sprint time over 10 m provided the most important contribution to the predictive model, followed (in order) by; successful ball retention·min⁻¹, slalom dribble time, predicted vertical power, unsuccessful ball retention·min⁻¹ and successful passes·min⁻¹. Based upon the discriminant function, a cross-validation analysis revealed the correct classification of all (100%) elite and subelite players into their respective groups.

**Discussion**

It was the aim of this study to identify which characteristics of match performance and physical ability discriminated between elite and subelite under-14 soccer players. The first finding of this study was that the elite soccer players were faster over 10–30 m, more agile, and performed more effectively in skill tests compared with subelite players. Our findings are inconsistent with research in Flemish youth soccer, where tests of skill (ball juggling, slalom dribble, shooting accuracy), agility,

<table>
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<tr>
<th>Step</th>
<th>Entered</th>
<th>Statistic</th>
<th>df1</th>
<th>df2</th>
<th>df3</th>
<th>Exact F</th>
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<tr>
<td>1</td>
<td>10-m sprint time</td>
<td>0.20</td>
<td>1</td>
<td>1</td>
<td>29</td>
<td>115.13</td>
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<tr>
<td>2</td>
<td>Successful ball retention·min⁻¹</td>
<td>0.06</td>
<td>2</td>
<td>1</td>
<td>29</td>
<td>200.16</td>
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<tr>
<td>3</td>
<td>Slalom dribble time</td>
<td>0.05</td>
<td>3</td>
<td>1</td>
<td>29</td>
<td>169.34</td>
</tr>
<tr>
<td>4</td>
<td>Predicted vertical power</td>
<td>0.04</td>
<td>4</td>
<td>1</td>
<td>29</td>
<td>144.10</td>
</tr>
<tr>
<td>5</td>
<td>Unsuccessful ball retention·min⁻¹</td>
<td>0.03</td>
<td>5</td>
<td>1</td>
<td>29</td>
<td>130.71</td>
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<tr>
<td>6</td>
<td>Successful passes·min⁻¹</td>
<td>0.03</td>
<td>6</td>
<td>1</td>
<td>29</td>
<td>125.92</td>
</tr>
</tbody>
</table>

Note. At each step, the variable that minimizes the overall Wilk’s Lambda is entered. Maximum number of steps is 48; Maximum significance of F to enter is $P = 0.05$; Minimum significance of $F$ to remove is 0.10.; $F$ level, tolerance or VIN insufficient for further computation.
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and speed did not distinguish between elite and subelite players (24). Similarly, a retrospective analysis of under-14 French soccer players showed no differences in leg strength, anaerobic power, speed, or vertical jump height among players reaching international, professional, or amateur status (15). The potential influence of maturity was not statistically controlled in the current study, which might account for the apparent inconsistency with previous research, whereby the participants’ maturity was assessed via radiological examination of the wrist (15). In addition, the relatively younger under-14 players sampled in previous studies (~13.5 years; 24), may provide some explanation for these findings. Nevertheless, limited differences in physical performance have also been observed among European-based players of the under-15 age group (15,24). Factors such as years of training experience, which was not assessed in both the current and previously mentioned studies, might also explain the differences found between groups, particularly for the skill-related elements (16).

Other reasons for the contrast in findings between the current study and previous research may be a consequence of the different eventual requirements of soccer at the professional level between countries. For example, Dellal et al. (8) reported adult Premier League players to cover more sprinting distance, high intensity distance and perform more aerial and ground duels compared with Spanish La Liga players. While performance at the youth level is unlikely to match that of an adult environment, it is possible that there are a variety of different demands associated with competing in different European leagues, which will inform the way that players are developed through their youth. Our findings bring into focus the selection policies of English youth soccer Academies, providing preliminary evidence of the emphasis placed upon early performance development. Further research evaluating the exposure to and quality of developmental-training practices among elite and subelite players of different nationalities is warranted, which may explain some of the differences observed herein.

Tests of skill and speed were shown to be significant predictors of elite players (Table 2); this is likely to relate to the requirements of soccer performance whereby players’ interaction with the ball and requirement to perform sprints (Table 1) is frequent. Indeed, out of the physical performance tests, the discriminant function analysis revealed 10 m speed, slalom dribble and predicted vertical power (owing to a higher body mass) as the three most important predictors of elite players. While performing better in these factors alone will not determine an elite player, coaches should prioritize conditioning practices that enhance each of these physical qualities among youth soccer players. Such tests may also contribute to the identification of talented players and can be easily carried out in a field-based setting. For example, further investigation of one subelite player, who was incorrectly classified in the original discriminant function (i.e., 96.8% of the between-group variance), revealed a relatively faster 10 m sprint speed (2.0 s), and higher successful ball retention·min⁻¹ (0.41) compared with the correctly classified subelite players. Such findings reflect the potential importance of the variables identified by the discriminant function analysis in determining elite or subelite players.

A notable finding of the current study was the contrast in match activity between the elite and subelite groups. Elite players performed more (p < .05) total m·min⁻¹, LIM m·min⁻¹, and HIM m·min⁻¹ than subelite players (Table 1), suggesting a higher external demand during elite matches. However, there were no differences (p > .05)
between the groups for postmatch RPE or %HRpeak obtained during matches. As such, our results are the first to suggest that elite youth players are able to maintain higher movement intensity during matches, without any additional physiological exertion. These results are in partial agreement with research in Danish youth soccer (~12 years), where elite players were shown to perform more jogging and cruising movements and fewer walking and standing compared with their subelite, maturity-matched counterparts (23). In contrast to the current findings, Strøyer et al. (23) reported a higher absolute HR response among elite players. However, the relative expression of HR (%HRpeak) in the current study precludes a direct comparison with the findings of Strøyer and colleagues. The ability of elite players to maintain higher movement intensity for the same %HRpeak may also provide greater fatigue resistance during matches, enabling the preservation of energy for technical and tactical contributions to match performance. For example, in adult team sports (Australian Football), it has been shown that a combination of estimated aerobic power and high intensity running during matches explains 15.4% of variation in the number of ball interactions (17). Among under-14 youth soccer players, aerobic power has also been shown to support the ability to maintain high intensity running (5) and is likely to explain the higher intensity observed in the elite players of the current study. A test of aerobic power, such as the YO-YO endurance test 2 (5), was not included in our battery, which is a limitation of the study. Nevertheless, it would appear that the ability to maintain high intensity running during matches is a prerequisite for players wanting to compete at the elite level, which should be considered by practitioners wishing to identify or prepare players for elite match performance. Of course, it remains unclear whether these findings are a broad reflection of the collective match standard, rather than an indication of individual playing ability. Indeed, the distribution (SD) of data with regard to the individual match running activity (i.e., HIM; elite = 14.52 ± 2.33 m·min⁻¹ cf. sub elite = 11.51 ± 3.78 m·min⁻¹) among the subelite players demonstrates the potential for individuals to perform at the elite standard.

With regard to match performance, the discriminant function analysis revealed both successful and unsuccessful ball retention·min⁻¹ as well as successful passes·min⁻¹ as significant predictors of elite performance. Indeed, the elite players consistently performed more game-specific skills per minute of matches compared with the subelite players (Table 1). Waldron and Worsfold (26) have previously demonstrated that elite under-14 soccer players will perform more dribbling, passing, and shooting actions than nonelite players during competitive extracurricular physical education matches. It is, therefore, characteristic of elite soccer players to perform a higher frequency of game-specific-skills, regardless of the type of competitive environment. Consistent with such findings, the elite players of the current study also performed more unsuccessful game-specific-skills. These findings suggest that it is the absolute amount of ball interactions performed by an elite player that separates them from their subelite counterparts, rather than successful interactions alone. Such findings highlight the contrast of tactical approaches in elite and subelite matches and, perhaps, the emphasis placed on elite players to attempt technical actions, regardless of their outcome. Indeed, the consistent completion of successful technical actions during matches should not be expected among developing under-14 players. Rather, it is advocated that the repetition of technical actions, set within the context of the competitive environment, should
be encouraged to develop skills that are specific to soccer performance (1). As such, our findings indicate the potential benefits of performing in elite, rather than subelite, soccer competition on skill development among under-14 English-based players. Subelite coaches should be cognizant of the ways in which their players could improve to match the abilities of higher standard players.

## Conclusion

Elite players outperformed their subelite counterparts in various closed tests of physical performance, which can be prioritized as 10-m sprint time, slalom dribble time, and predicted vertical power. Such tests will discriminate between players and could be easily administered by practitioners in the field.Elite players were also found to complete more total m·min⁻¹, LIM m·min⁻¹, and HIM m·min⁻¹ than subelite players without any difference in the HR or perceptual responses. In turn, the elite players also performed a higher frequency of each game-specific-skill. The results reported herein support previous evidence that shows elite players’ physical abilities to manifest themselves in match performance (23). As such, the analysis of match performance provides a more thorough understanding of the criteria that underlies talent in soccer. The variables identified by the discriminant function analysis as predictors of elite standard players should be prioritized by soccer practitioners for the preparation and identification of young players.

## References