Declarative Tactical Knowledge and Playing Position in a Professional Football Club: Real Sociedad

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Abstract
There is a need to characterise playing positions in football, as well as to investigate the relationship between declarative (DTK) and procedural (PTK) tactical knowledge. For these reasons, the aim of the study was to analyse the influence of playing position on the DTK of 163 players (16.7 ± 2.4 years) in the academy of a professional football club. The “TESTACTICO for F7” tool was used to assess the DTK of the participants, analysing the results obtained according to their positions (goalkeepers, central defenders, external defenders, midfielders, wingers and forwards), and ensuring an adequate effect size ($f = 0.28$) via G*Power. ANOVA analysis of variance was implemented, using Tukey’s HSD test for multiple post hoc comparisons, by assessing the magnitude of the differences found by pairs of positions through the Cohen’s $d$ effect size. Macro level comparisons between positions revealed no significant differences in overall offensive and defensive scores. Significant differences were found between groups at the meso level ($p \leq .05$) in the operational principle “Progress towards rival area” and the fundamental principle “Width and length”. However, the post hoc pairwise comparison revealed non-significant differences in both variables. The same happened at the micro level with the behaviours “dribble to beat the rival” and “give depth to the attack by positioning in length”. In conclusion, the DTK values did not allow for differentiation between players according to their position, which casts doubt on a direct relationship between DTK and PTK.

Keywords: decision making, football training, performance, positional role, talent.
Introduction
Due to the highly demanding nature of football matches, different tactical roles of the players are needed in order for the team to act as a whole (Gréhaigne et al., 1997). These various roles are influenced by the playing position assumed by each player in the match (Machado et al., 2019; Padilha et al., 2013). In each position, there are behaviours that are more important than others, either because they occur more frequently or because they are particularly relevant (Sánchez-López et al., 2023a). For this reason, studies (Berber et al., 2020; Mota et al., 2023) have been aimed at defining attributes for positional profile characterisation in football. Similarly, in recent years, the effects of playing position during football training on different variables such as: visual search strategies (Dambroz et al., 2022); tactical behaviours in reduced and conditioned games (Machado et al., 2019); offensive and defensive tactical performance (Gonçalves et al., 2017); workload demands in matches and reduced games (Beenham et al., 2017); advanced biological maturation (Sweeney et al., 2023); injury incidence rate (Hall et al., 2022) and the ability to repeat sprints (Çetin & Koçak, 2022) have been investigated.

Regarding tactical knowledge, a distinction can be made between Procedural Tactical Knowledge (PTK) and Declarative Tactical Knowledge (DTK). PTK is closely linked to motor action (Kirkhart, 2001; Teoldo et al., 2011; Williams & Davids, 1995), to “know-how”. DTK, understood as the explicit knowledge that is stored in memory, is associated in game terms with “knowing what to do” (Thomas et al., 1986), i.e. with the player’s decision making in a theoretical game situation. In recent years, the relationship between declarative and procedural approaches has been studied in relation to the tactical performance of football players, leading to the conclusion that more tactically skilled players obtain higher scores in terms of decision making (Vítor de Assis et al., 2020), and that selected players are faster and make better decisions than those who are not selected (Machado et al., 2023). In this sense, analysing the impact of playing position on players’ DTK may verify whether there is a relationship between knowing what to do and doing it in specific game aspects, given that procedurally there are tactical behaviours that are better developed by players who occupy certain positions (e.g. shooting in forwards or tackling in defenders).

Regarding the relationship between playing position and DTK, a study (Giacomini et al., 2011) conducted with 221 young football players in an amateur context revealed no significant differences in players’ DTK according to the playing position occupied on the field. Nor were significant differences in the quality of responses found in another study (Andrade et al., 2021), with a sample of 30 U-13 players in regional competition. Although work that has assessed the DTK of players in academies of professional football clubs already exists (Sánchez-López et al., 2023c), no studies have been found that assess DTK according to playing position. Furthermore, it would be interesting to include different tactical dimensions in the DTK assessment, from those that have to do with the particular behaviours of the players (micro level), those linked to the socio-motor role and the principles of the game (meso level) and those that involve the set of behaviours that define the player’s performance, both in offensive and defensive phases of the game (macro level).

Therefore, the aim of this study was to analyse the influence of playing position on the DTK of players in the academy of a professional football club. A first hypothesis was that no significant differences would be found according to playing position at the macro level. A second hypothesis was that there would be significant differences according to playing position at meso and micro level in some game aspects. In addition, a third hypothesis that players’ mental representations may not be in line with what they actually do was presented. In other words, those game aspects that players perform best, and which are most linked to their playing position in procedural terms, need not be those aspects that they manage best declaratively. Addressing these hypotheses could help to further clarify the relationship between declarative and procedural aspects, and consequently improve learning processes.

Method
Design
To obtain each participant’s DTK score, selective methodology was used in accordance with the following requirements (Anguera, 2003): the mental representations of the sample were accessed through the participants’ direct interventions; a standardised multiple response test was used; the variables of interest were selected prior to the study; the possible covariance relationships between the variables were analysed; and it was nomothetic, as the test was applied extensively to a set of participants.
Table 1
Levels of concretion and variables of “TESTACTICO for F7” via Football Competence Observation System (FOCOS).

<table>
<thead>
<tr>
<th>Attack</th>
<th>Dependent Variables</th>
<th>Defence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player’s Declarative Tactical Knowledge</td>
<td></td>
<td></td>
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<tr>
<td><strong>MACRO LEVEL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offensive score</td>
<td>Global Score</td>
<td>Defensive Score</td>
</tr>
<tr>
<td><strong>MESO LEVEL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attacker with the ball</td>
<td>Defender in the intervention space</td>
<td></td>
</tr>
<tr>
<td>Attacker without the ball in the game center</td>
<td>Roles</td>
<td>Defender in game center</td>
</tr>
<tr>
<td>Attacker without the ball out of the game center</td>
<td></td>
<td>Defender out of game center</td>
</tr>
<tr>
<td>Ball control</td>
<td>Tackling</td>
<td></td>
</tr>
<tr>
<td>Driving</td>
<td>Interception</td>
<td></td>
</tr>
<tr>
<td>Dribble</td>
<td>Dissuading</td>
<td></td>
</tr>
<tr>
<td>Passing</td>
<td>Own Action of the Sub-Role</td>
<td>Relocating</td>
</tr>
<tr>
<td>Shooting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Move off-the-ball</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain ball possession</td>
<td>Regain Possession</td>
<td></td>
</tr>
<tr>
<td>Progress towards rival area</td>
<td>Operational Principles</td>
<td>Prevent opponent’s progression</td>
</tr>
<tr>
<td>Achieving the goal</td>
<td></td>
<td>Protect the goal</td>
</tr>
<tr>
<td>Penetration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offensive coverage</td>
<td>Delay</td>
<td></td>
</tr>
<tr>
<td>Depth mobility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width and length</td>
<td>Core Principles or Specific Principles of Football</td>
<td></td>
</tr>
<tr>
<td>Offensive unity</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MICRO LEVEL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1 - Control the ball ahead of previous action (*)</td>
<td>D1 - Make a tackle to the rival</td>
<td></td>
</tr>
<tr>
<td>A2 - Control the ball at the same height or behind the previous action (*)</td>
<td>D2 - Intercept, clear or divert a pass</td>
<td></td>
</tr>
<tr>
<td>A3 - Control the ball in the rival area or in front of the last defender (or surpassed this one)</td>
<td>D3 - Block a shot</td>
<td></td>
</tr>
<tr>
<td>A4 - Driving the ball forward (*)</td>
<td>D4 - Redirect the opponent’s attack</td>
<td></td>
</tr>
<tr>
<td>A5 - Driving the ball backwards, right, or left (*)</td>
<td>D5 - Do not give the opponent a shot option without entering him (avoid possible shot)</td>
<td></td>
</tr>
<tr>
<td>A6 - Driving the ball in the rival area or in front of the last defender (or surpassed this one)</td>
<td>D6 - Take care of the partner’s back in the intervention space in a staggered manner</td>
<td></td>
</tr>
<tr>
<td>A7 - Dribble to beat the rival (*)</td>
<td>D7 - Move to create superiority in the game center or mark/watch opponents</td>
<td></td>
</tr>
<tr>
<td>A8 - Dribble without progress avoiding rival tackle (*)</td>
<td>D8 - Create uncertainty in the last opponent line or reduce the effective playing space</td>
<td></td>
</tr>
<tr>
<td>A9 - Dribble in the rival area or in front of the last defender (or surpassed this one)</td>
<td>D9 - Relocation in the last defensive line reducing the effective playing space</td>
<td></td>
</tr>
<tr>
<td>A10 - Pass the ball forward (except to assist)</td>
<td>D10 - Increase the protection of the goal, marking or watching opponents</td>
<td></td>
</tr>
<tr>
<td>A11 - Pass the ball backward, right, or left (except to assist)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A12 - Assist teammate to score goal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A13 - Shoot at goal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A14 - Move giving close option ahead of the ball</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A15 - Appear in a space suitable to scoring a goal (near the teammate with the ball)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A16 - Take care of the back of the partner with the ball or give option close to the right / left</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A17 - Move away from the ball appearing between rival lines or behind the defense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A18 - Appear in a space suitable to scoring a goal (away from the teammate with the ball)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A19 - Give depth to the attack by positioning in length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A20 - Give amplitude to the attack by positioning in width</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A21 - Relocate in coordination with the teammates on the last line</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) Except in the rival area or in front of the last defender (or surpassed this one)
The test was completed by the participants in May, at the end of the 2021-2022 season. Then, using an associative strategy, a retrospective comparative design approach was implemented (Ato et al., 2013), which determined the possible influence of the independent variable on the dependent variables. In this case, the playing position acted as the independent variable and the dependent variables were the 67 DTK-based scores of the participants, according to three levels of specificity, from the most general to the most specific aspects. A first level, or macro level, which enables the analysis of the total test scores (overall, offensive and defensive); a second level, or meso level, comprising the criteria category systems (roles, subrole actions, operational principles and fundamental or football-specific principles) that make up the observation system used as a reference; and a third level, or micro level, with more specific scores based on general tactical behaviours (see Table 1).

### Participants
A total of 163 football players (16.7 ± 2.4 years) aged 12 to 22, who were members of the men’s teams in the Real Sociedad de Fútbol’s Academy, formed the sample for this study. According to the Participant Classification Framework (McKay et al., 2022), the sample can be categorised at level 3: “Highly Skilled/National Level”. This level includes teams of national and/or state leagues/tournaments (≈ 0.014% of the world population). Table 2 contains further information on the sample grouped by playing position, in order to illustrate the context of the academy and to ensure consistent replicability of the study in other clubs.

### DTK Assessment Tool
TESTACTICO for F-7 (football-7) (Sánchez-López et al., 2023b) can be included within the range of instruments classified as multiple-choice tests with static images of game situations that allow DTK assessment. It was designed based on the findings of a systematic review (Sánchez-López et al., 2022), yielding evidence of content and construct validity, as well as reliability and generalisability. These processes were discussed in detail in a recent publication (Sánchez-López et al., 2023b). The tool is composed of 62 game situations classified according to the Football Competence Observation System—FOCOS— (Sánchez-López et al., 2021).

In each situation, the participant has to put himself in the place of one of the football players and choose from the four options presented, with one correct and three incorrect solutions. Each game situation simultaneously addresses a role, a certain action resulting from the acquired subrole, an operational principle, a fundamental principle and a general tactical behaviour (see Figure 1).

### Table 2
Sample characteristics and DTK scores (macro-level) according to playing position.

<table>
<thead>
<tr>
<th>Playing Position</th>
<th>N</th>
<th>Age (in years)</th>
<th>Experience (in years)*</th>
<th>In the club (years)</th>
<th>Global DTK</th>
<th>Offensive DTK</th>
<th>Defensive DTK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goalkeeper</td>
<td>17</td>
<td>16.4 ± 2.3</td>
<td>7.9 ± 2.1</td>
<td>3.6 ± 2.1</td>
<td>8.7 ± 0.6</td>
<td>9.0 ± 0.6</td>
<td>8.0 ± 0.9</td>
</tr>
<tr>
<td>Central defender</td>
<td>27</td>
<td>16.8 ± 2.6</td>
<td>8.0 ± 2.0</td>
<td>3.9 ± 2.3</td>
<td>8.8 ± 0.5</td>
<td>9.0 ± 0.6</td>
<td>8.3 ± 0.9</td>
</tr>
<tr>
<td>External defender</td>
<td>33</td>
<td>16.9 ± 2.6</td>
<td>8.0 ± 1.9</td>
<td>3.9 ± 2.8</td>
<td>8.6 ± 0.7</td>
<td>8.8 ± 0.9</td>
<td>8.2 ± 0.9</td>
</tr>
<tr>
<td>Midfielder</td>
<td>38</td>
<td>16.7 ± 2.4</td>
<td>8.0 ± 1.8</td>
<td>3.7 ± 1.9</td>
<td>8.6 ± 0.7</td>
<td>8.8 ± 0.7</td>
<td>8.1 ± 1.0</td>
</tr>
<tr>
<td>Winger</td>
<td>26</td>
<td>16.9 ± 2.2</td>
<td>8.3 ± 2.1</td>
<td>3.8 ± 2.2</td>
<td>8.7 ± 0.6</td>
<td>9.0 ± 0.6</td>
<td>8.3 ± 1.0</td>
</tr>
<tr>
<td>Forward</td>
<td>22</td>
<td>16.7 ± 2.6</td>
<td>8.4 ± 1.6</td>
<td>3.3 ± 1.9</td>
<td>8.5 ± 0.9</td>
<td>8.8 ± 0.8</td>
<td>8.0 ± 1.4</td>
</tr>
</tbody>
</table>

* Experience of more than 10 years was considered exactly 10 years.
Procedure
In order to assess the participants, a specific room at the Zubieta Academy was used. The participants took the test using a laptop, they were separated so that they were unable to see each other’s answers, and they were supervised by the Club’s coaches. After arriving in the room, they received a link to a Google Form containing the assessment test.

Once on the form, and after receiving a brief explanation of the test, participants filled in their demographic data, as well as other data of scientific interest, which would serve as independent variables in future studies. Subsequently, they were faced with 62 game situations comprising the test, which lasted approximately 25-45 minutes depending on age, so that it could be carried out quickly and sustainably.

Immediately after completion of the test, participants were able to access their overall score (from 0 to 62 points), and the researcher received the raw data, which were exported to an Excel file for cleaning, processing and organising. Following this process, each variable studied was presented on a scale from 0-10 for the macro and meso levels, and 0-2 for the micro level.

Statistical Analysis
An Excel database containing the data obtained from the DTK assessment test was created and organised for processing. The Google Colab environment’s Python programming language was used to process and visualise the results obtained using the libraries numpy, pandas, seaborn and matplotlib. SPSS v.19 software was also used to explore significant evidence according to playing position. ANOVA analysis of variance was used, using Tukey’s HSD test for multiple post hoc comparisons. The sample was analysed according to playing position (n = 6), using G*Power v3.1 software to determine the robustness of the test. A one-way fixed effects ANOVA design was implemented, analysing sensitivity based on the following parameters (α = 0.05, robustness = 0.80, total sample = 163, number of groups = 7). Sensitivity detects the minimum effect size of the test (Cardenas & Arancibia, 2014) which was adequate (f = 0.28) for the study conducted (Cohen, 1988).

Following the procedure implemented in the study in which the tool used was validated (Sánchez-López et al., 2023b), and in order to control the family-wise error rate per category system in each criterion, the following references were used for statistical significance, to establish comparisons.
between playing positions: total scores \((n = 3, p \leq .017)\), roles \((n = 6, p \leq .008)\), subrole actions \((n = 11, p \leq .005)\), operational principles \((n = 6, p \leq .008)\), fundamental or football-specific principles \((n = 10, p \leq .005)\) and general tactical behaviours \((n = 31, p \leq .002)\). The Cohen’s \(d\) effect size was also calculated (Cohen, 1988) to assess the extent of the differences found in the study groups. Differences based on effect size are descriptively referred to as either very large \((d \geq 2)\), large \((2.0 > d \geq 1.2)\), moderate \((1.2 > d \geq 0.6)\), small \((0.6 > d \geq 0)\) or trivial \((0.2 > d \geq 0)\) (Hopkins et al., 2009).

### Results

The results are presented in different sections, starting with the macro level (total scores), followed by the meso level (roles, subrole actions, operational principles and fundamental or football-specific principles), and finishing with the micro level (general tactical behaviours).

#### Macro Level

The test scores at the macro level (on a scale from 0 to 10) did not reveal significant differences in any of the three variables studied: overall score \((p = .76, F = 0.53)\), offensive score \((p = .72, F = 0.58)\) and defensive scoring \((p = .81, F = 0.46)\). Table 2 displays the average and deviation of the scores obtained according to playing position.

#### Meso Level

The meso level (on a scale from 0 to 10) refers to the category systems of the criteria (roles, subrole actions, operational principles and fundamental or football-specific principles) of the Football Competence Observation System (Sánchez-López et al., 2021). Analysing each criterion separately, the following results were obtained. No significant differences were found in the role criterion categories.

For subrole actions, “positioning” was the category with the greatest differences \((p = .06, F = 2.11)\), although these did not reach the threshold for sufficient statistical significance \((p \leq .05)\). The post hoc pairwise comparison revealed non-significant differences \((p = .12)\) between central defenders \((8.4 \pm 1.4)\) and forwards \((7.2 \pm 2.0)\) of moderate effect size \((d = 0.66)\).

Regarding operational principles, significant differences were found in progress towards rival area \((p = .05, F = 2.26)\). The post hoc pairwise comparison revealed that goalkeepers \((9.4 \pm 0.6)\) and midfields \((8.7 \pm 0.9)\) displayed non-significant differences \((p = .09)\) of moderate effect size \((d = 0.91)\). For fundamental or football-specific principles, there were significant differences between groups when it came to Width and length \((p = .03, F = 2.58)\). “Defensive coverage” \((p = .08, F = 1.99)\) also revealed differences between playing positions, although these were above statistical significance \((p \leq .05)\). On the one hand, the post hoc pairwise comparison for “Width and length” revealed non-significant differences \((p = .18)\) of small effect size \((d = 0.55)\) between central defenders \((9.0 \pm 1.1)\) and midfields \((8.4 \pm 1.1)\). On the other hand, goalkeepers scored lowest in “defensive coverage” \((4.7 \pm 3.7)\), whilst external defenders \((7.6 \pm 3.3)\) and wingers \((7.7 \pm 3.2)\) scored the highest. The differences were of moderate effect size \((d = 0.83 y d = 0.87)\), but were not statistically significant \((p = .07 y p = .08)\).

#### Micro Level

Finally, the micro level (on a scale from 0 to 2) represents the highest level of detail and is linked to the general tactical behaviours of the study framework. In this case, significant differences were found in the following behaviours: “Dribble to beat the rival” \((p = .01, F = 2.98)\) and “positioning to give depth to the attack” \((p = .01, F = 3.17)\). The post hoc pairwise comparisons for “Dribble to beat the rival” revealed non-significant differences \((p = .02)\) of moderate effect size \((d = 0.84)\) between wingers \((1.9 \pm 0.3)\) and midfields \((1.5 \pm 0.6)\). Regarding “Give depth to the attack by positioning in length”, goalkeepers \((1.7 \pm 0.5)\) and central defenders \((1.6 \pm 0.7)\) scored best, and midfields \((1.1 \pm 0.8)\) and forwards \((1.0 \pm 0.8)\) the worst. The post hoc pairwise comparisons revealed non-significant differences between goalkeepers and midfields \((p = .07)\), goalkeepers and forwards \((p = .03)\), and central defenders and forwards \((p = .08)\). The differences were of moderate effect size \((d = 0.9, d = 1.0 y d = 0.8)\), respectively. An overview of all the results obtained at the micro level is displayed by violin plots in Figure 2, which demonstrates the density of the scores in each assessable section.
Figure 2
DTK Scores based on General Tactical Behaviours according to Playing Position.

General Offensive Tactical Behaviours:
A1 - Control the ball ahead of previous action (*)
A2 - Control the ball at the same height or behind the previous action (*)
A3 - Control the ball in the rival area or in front of the last defender (or surpassed this one)
A4 - Driving the ball forward (*)
A5 - Driving the ball backwards, right, or left (*)
A6 - Driving the ball in the rival area or in front of the last defender (or surpassed this one)
A7 - Dribble to beat the rival (*)
A8 - Dribble without progress avoiding rival tackle (*)
A9 - Dribble in the rival area or in front of the last defender (or surpassed this one)
A10 - Pass the ball forward (except to assist)
A11 - Pass the ball backward, right, or left (except to assist)
A12 - Assist teammate to score goal
A13 - Shoot at goal
A14 - Move giving close option ahead of the ball
A15 - Appear in a space suitable to scoring a goal (near the teammate with the ball)
A16 - Take care of the back of the partner with the ball or give option close to the right / left
A17 - Move away from the ball appearing between rival lines or behind the defense
A18 - Appear in a space suitable to scoring a goal (away from the teammate with the ball)
A19 - Give depth to the attack by positioning in length
A20 - Give amplitude to the attack by positioning in width
A21 - Relocate in coordination with the teammates on the last line

(*) Except in the rival area or in front of the last defender (or surpassed this one)

General Defensive Tactical Behaviours:
D1 - Make a tackle to the rival
D2 - Intercept, clear or divert a pass
D3 - Block a shot
D4 - Redirect the opponent’s attack
D5 - Do not give the opponent a shot option without entering him (avoid possible shot)
D6 - Take care of the partner’s back in the intervention space in a staggered manner
D7 - Move to create superiority in the game center or mark/watch opponents
D8 - Create uncertainty in the last opponent line or reduce the effective playing space
D9 - Relocation in the last defensive line reducing the effective playing space
D10 - Increase the protection of the goal, marking or watching opponents

Y-axis Scores:
2 - Participants know what to do
1 - Participants are not sure
0 - Participants do not know what to do
Discussion
The aim of this study was to analyse the influence of playing position on the DTK of players in the academy of a professional football club. The first hypothesis of the study was confirmed, as, at the macro level, no significant differences were found according to playing position. This finding is consistent with results published in previous studies (Andrade et al., 2021; Giacomini et al., 2011), where no differences in the quality of declarative decision making according to playing position were found.

The second hypothesis suggested that there would be significant differences according to playing position at the meso and micro levels in some aspects of the game. This assumption was partly confirmed, since the results of the study revealed significant differences (p ≤ .05) between positions at the meso and micro levels. However, no statistically significant pairwise differences were obtained according to the tool reference values (Sánchez-López et al., 2023b). This implies that the following findings should be treated with caution and should not be applied to other populations.

Being at the centre of the game (Gréhaigne et al., 1997), i.e. in the vicinity of the ball (10-12 m), or being outside of it, produces different behaviours in players during the course of the game. Regarding the actions linked to socio-motor subroles, central defenders were better than forwards at “positioning”, which is linked to knowing what to do in situations that occur outside the centre of play connected to giving depth, width or repositioning in the defensive line. This may be because central defenders have a privileged view of the movements of all their team-mates and play a very important role in communicating how to organise the team and where to position the defensive line.

With regard to operational principles, goalkeepers showed greater on-field efficiency than midfielders in terms of “defensive coverage”. In addition, central defenders scored higher than midfielders for the fundamental principle of “width and length”. This finding is in line with the results of a study (Praça et al., 2020) on the impact of all-rounder players in different contexts in reduced games, as it was found that midfielders took actions linked to width and depth without the ball in terms of PTK less frequently. However, another study (Andrade et al., 2021) revealed that goalkeepers showed a greater ability to read the game and make quicker decisions compared to defenders in terms of DTK. In this respect, because of their playing position, central defenders, unlike midfielders, tend to have more time and a better position for anticipating their team-mates’ positions on the pitch.

At the micro level, wingers had a higher DTK than midfielders in situations involving the behaviour “dribble to beat the rival”, which could be due to the fact that wingers have a greater impact in areas close to the opponent’s goal, usually occupying an open position and making more assists and dribbles than players in other positions (Izquierdo et al., 2023). It was also revealed that goalkeepers and central defenders scored higher than forwards and midfielders in situations linked to the general tactical behaviour of “Give depth to the attack by positioning in length”. Paradoxically, goalkeepers and central defenders are the furthest away from those spaces that condition the depth of the team, and it is the forwards who must understand how to manage these spaces in order to provide depth to the team. It is true that goalkeepers and centre-backs will often have to look wide to play direct, and, perhaps because of this, they had a greater declarative knowledge of how best to exploit the depth of space.

The third hypothesis that the players’ mental representations may not be in line with what they actually do, was confirmed. To arrive at this finding, an analysis of whether or not the actions linked to the socio-motor subroles that players perform best on the field are those that they manage best declaratively was carried out, bearing in mind that each playing position requires different skills. The results demonstrated that there were no significant differences by playing position. However, it is interesting to analyse certain results of some positions.

In the case of goalkeepers, it is striking that they scored higher than outfield players (given that the tool evaluates outfield players’ game situations), and in some variables they were even the position with the highest scores. This may
be because the goalkeeper’s position provides a very good field of vision from which to observe the game and, therefore, they can be more receptive to what their teammates are doing and even anticipate their behaviour. However, the results revealed some very peculiar findings at the defensive level. In the actions “tackling” and “interception”, goalkeepers obtained the highest scores, whilst, in “dissuading and relocating”, goalkeepers obtained the lowest scores. The fact that goalkeepers scored the worst for actions that occur away from the ball (“relocating”) raises a debate as to whether it is the goalkeeper who should lead the coordination of defensive movements or whether the defence should organise itself. The results suggest that goalkeepers focus their attention on the ball. Therefore, goalkeeping coaches could help them to focus on what is happening outside the centre of play (for example, the opponents’ movements on their weak side, surveillance and marking in possible finishing areas, clearances behind their defensive line...) from the privileged position they usually occupy.

Central defenders scored the highest for the action “dribbling”, followed by wingers. Although “dribbling” is obviously not an action specific to central defenders, these players could have a high DTK of situations related to this action, given that they have to deal with it regularly because of their opponents, and it is closely linked to “tackling”. It is precisely the central defenders who scored higher for “tackling” than the rest of the outfield players. They also stood out from the other playing positions defensively in the “relocating” action, which is closely linked to movements used to reorganise themselves with their teammates and facilitate the joint action of protecting their own goal.

The external defenders, together with the wingers, obtained the highest scores for the action “driving”, although there were no significant differences in relation to the other playing positions. In contrast to the central defenders, the external defenders obtained the lowest scores for “dribbling” and outperformed the midfielders only for the action “tackling”. These results seem to differ from what is happening at a procedural level, because it is usually the backs who are the first to deal with attempts by the opposing wingers to advance.

The midfielders did not stand out for “passing”, as might have been expected, given that they account for most of the passes made by the team during the match, an they are key players in this respect (Oliveira et al., 2016). In addition, this position scored worst for the actions “tackling”, “driving”, “dribble and interception”. However, midfielders scored highest for the actions “move off-the-ball and dissuading”, which are closely linked to the management of space around the ball.

The wingers scored highly in “driving” and “dribble”, actions linked to their playing position. However, together with the forwards, they scored worst at the action move off-the-ball which is also closely linked to their playing position.

Forwards scored highest in “shooting”, as did wingers, centre-backs and goalkeepers. The backs and midfielders scored very highly, but did not obtain the top scores. These types of situations, so close to the opponent’s goal, seem to be very easy to solve, at a declarative level, for highly skilled football players, so it is not possible to make an assessment with this type of sample. For “ball control”, the forwards scored the best and the central defenders the worst.

From the above, although certain relationships between declarative and procedural aspects in the playing positions studied were described, it should be emphasised that no significant differences were found according to playing position. In this regard, it can be argued that although DTK is a characteristic of football competence (Williams & Davids, 1995), high DTK does not always imply high football competence. Whilst how to play can be learnt by playing, i.e. through practice, declarative aspects can be learnt in other non-motor ways (visualisation, reflection, questioning...). In other words, DTK and PTK address two very different dimensions, the non-motor and the motor, or, in other words, knowledge and know-how.

In terms of study limitations, some of them can be summarised. On the one hand, although the quality of the sample relates to players at the highest level of competence for their age, as they are all enrolled in the same professional football academy, it would be interesting to have had a larger number of participants. In addition, it would have been interesting to access a sample of younger players, e.g. < 12 years old, potentially revealing other types of relationships between declarative and procedural aspects, before there is a very clear positional specialisation. It would also have been interesting to access response time in declarative decision making, as differences at the positional level have been described (Andrade et al., 2021).

In terms of the practical application of the findings, no significant differences were found between playing positions with respect to position-specific DTK. As this is the first study of this kind, further work is needed to advance the understanding of how players claim to behave and how they actually behave.
Conclusions
This study revealed that players in a professional football academy did not exhibit significant macro level differences (overall, offensive and defensive scores) in their DTK according to playing position. At the meso level (roles, subrole actions, operational principles and fundamental or football-specific principles), significant (p ≤ .05) differences were found according to position in the operational principle “progress towards rival area” and the fundamental principle Width and length. However, the post hoc pairwise comparison revealed no significant differences in both variables. Finally, at the micro level, the same was true for the general tactical behaviours dribble to beat the rival and “give depth to the attack by positioning in length”. In conclusion, it is possible to find players who, in aspects linked to their own playing position, present a lower DTK than that shown by players who play other positions, which calls for the need to continue rethinking the degree of relationship between DTK and PTK.

Conflict of Interests
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