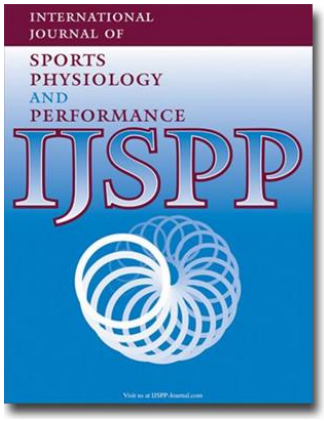


In press

**Title: Small-Sided Games in elite soccer: Does one size fits all?**

**Submission type:** Original investigation

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***Running head:*** Small Sided Games in elite soccer

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***Abstract word count***: 246

***Text-only word count***: 3482

***Number of Tables***: 3

***Number of figures:*** 3

***Disclosures***: nothing to disclose.

## 1. Abstract

Purpose: To compare the peak intensity of typical Small Sided Games (SSGs) with those of official matches in terms of running demands and mechanical work over different rolling average durations and playing positions.

Method: Data were collected in 21 players (25±5 y, 181±7 cm, 77±7 kg) belonging to an elite French football team. SSG data were collected over two seasons during typical training sessions (249 files, 12±4 per player) and official matches (n=12). Players' locomotor activity was recorded using 15-Hz GPS. Total distance (TD, m), high-speed distance (HS, distance above 14.4 km.h-1, m) and mechanical work (MechW, a.u) were analysed during different rolling average periods (1 to 15 min). The SSGs examined were 4v4+Goal Keepers (GKs), 6v6+GKs, 8v8+GKs and 10v10+GKs.

Results: Peak TD and HS during 4v4, 6v6 and 8v8 were likely-to-most likely largely lower than during matches (ES: -0.59,±0.38 to -7.36,±1.20). MechW during 4v4 was likely-to-most likely higher than during matches (1-4-min; 0.61±,0.77 to 2.30±,0.64). Relative to their match demands, central defenders (CD) performed more HS than other positions (0.63±,0.81 to 1.61±,0.52) during 6v6. Similarly, central midfielders (CM) performed less MechW than the other positions during 6v6 (0.68,±0.72 to 1.34,±0.99) and 8v8 (0.73,±0.50 to 1.39,±0.32).

Conclusion: Peak locomotor intensity can be modulated during SSGs of various formats and durations to either over- or underload match demands, with 4v4 placing the greatest and the least emphasis on MechW and HS, respectively. Additionally, CD and CM tend to be the most and least overloaded during SSGs, respectively.



**Key words:** Small sided games, soccer, peak intensity, match demands, periodisation,

## 2. Introduction

While it is important for football players to have well-developed physical and physiological qualities,[1] match contextual factors[2] often prevent highly-trained players to fully utilise their physical potential during matches. Indeed, it has been shown that in the case of an early player dismissal, the players remaining on the pitch could increase their running performance individually to maintain overall team running performance.[3] Additionally, elite young CM and strikers have been reported to only reach ~85 to ~94% of their maximal sprinting speed during matches, respectively.[4] The current understanding is that elite football players do not necessarily require to be the fittest athletes but at least, fit enough to cope with the demands of the match and execute their tactical role efficiently.

As such, during recent years, soccer training concepts and methodologies have evolved towards more integrated types of physical training, i.e., training with the ball under match-derived situations, which prioritises both the quality and the density of players' specific actions and inter-communication over pure physical development. This systematic training approach is often referred to as 'the tactical periodization model';[5] its key principle is the overload, relative to match demands, of each of the three main fitness components (strength, endurance, speed) within a football-specific manner during the week, rather than throughout a single session. Besides the specific tactical principles that every coach aims to implement during sessions, it has been shown that match-overload could be reached, and in turn, football-fitness developed using (at least partially) small sided games (SSGs).[6] In fact, with appropriate formats (e.g., number of players, area, rules), SSGs can be associated with high occurrences of player interactions (as a function of the decreased number of players and reduced space) and intense physical demands.[7] Training programs over several weeks including SSGs have reported improvements in various match winning-related factors including technical proficiency, tactical awareness, speed, strength and endurance performance.[6,8-10]

Nevertheless, the typical SSG formats that are most likely to target specific physiological attributes, as required within the tactical periodization model, are still unknown. Surprisingly also, is how the locomotor intensity of commonly-used SSGs compare to that of matches is unknown. This is somewhat surprising since within the tactical periodization model, most exercises are organized in comparison to match demands to ensure an optimal work/recovery balance from one day to the following.[5] One of the challenges to assess match demands is that the intensity and density of actions is likely time-independent, i.e., the longer the period, the lower the average intensity. For that reason, it is difficult to compare the locomotor intensity of different SSG formats of various durations with the

demands of a 90-min game. To shade light upon this important question for practitioners, the match-related locomotor intensity vs. time relationship during matches can now be modelled using a power relationship.[11] This latter study in professional soccer established the duration-specific profile of peak running periods from 1 to 90 min. As time approached zero, relative distance peaked between 170 and 200 $m.min^{-1}$, depending on positions. While these results can provide coaching staff with clear information on peak match intensity over various time periods, comparing training drills such as SSGs has never been examined, so that it remains difficult to translate these match-related information into actual training content.

To examine at which extent different SSG formats could be used to either under- or overload the running- and/or mechanical- demands of competitive matches, we first compared using power law modelling the peak locomotor intensity of different typical SSGs with those of official matches in terms of running demands and mechanical work over different rolling average durations. A second objective of the present study was to examine the effect of playing positions on the magnitude of the differences in locomotor intensity responses between SSG and matches, which should help coaching staff to better individualise their training plans.

## 3. Methods

*Participants:*

Data were collected in 21 players (25±5 y, 181±7 cm, 77±7 kg) belonging to an elite French football team (qualified for the last stage of the Champion's league competition) during two consecutive seasons (2014-2015 and 2015-2016). Players were grouped according to their playing position, as central defender (CD: n=4), wide defender (WD: n=6), central midfielder (CM: n=6) and forwards (AM: n=5). These data arose from the daily player monitoring in which player activities are routinely measured over the course of the season. Therefore, ethics committee clearance was not required.[12] The study conformed nevertheless to the recommendations of the Declaration of Helsinki.

*Study Overview*

All match data were collected during both pre-season friendly (n=7) and competitive (French League 1, n=5) matches, with the team systematically playing in a 4-3-3 formation for a total of 64 player-

match observations. Only data from players who completed the 1st half of the match were analysed in order to limit the effect of pacing strategies or possible performance decrement toward the end of the match.[2] All SSG data were collected in-season on a hybrid turf (DESSO GrassMaster, Tarkett, Nanterre, France) during typical training sessions. Players' activity was recorded using 15-Hz GPS (SPI-Pro, Team AMS R1 2016.8, GPSports, Canberra, Australia) and analysed using Athletic Data Innovations analyser (v5.4.1.514, Sydney, Australia)[13] to derive total distance (TD, m), high-speed distance (HS, distance above 14.4 km.h-1, (m)) and mechanical load (MechW, a.u) during different rolling average periods (1, 2, 3, 4, 5, 6, 8, 10, 12 and 15 min). To limit inter-unit error, each player wore the same unit throughout the course of the two seasons.[14] MechW is an overall measure of velocity changes and is calculated using >2m.s-2 accelerations, decelerations and changes of direction events.[15] It reliability and validity is in the same range of acceleration and deceleration variables using the same technology. To smooth the data and make sure the greatest high-intensity periods would be captured,[16] an overlapping between the successive windows (1 to 15-min duration) was applied. The duration of the overlapping was set either as 20% of the period length (for 1 to 5-min rolling average periods, i.e., 12 s to 1 min overlapping) or as 1 min (remaining longer durations windows). The peak value obtained for each SSG and match for each variable was recorded. Figure 1 shows, in a representative player, peak activities during the different SSGs compared with match demands (gray zone, as mean + standard deviations to mean - standard deviations) as a function of each rolling average period.

*Small-Sided Games*

Only the most standardised SSGs (3 touches max) over the two seasons were used for analysis: (1) 4v4+goal keepers (GKs), n=27 game observations, dimensions: 25x30m, surface area per player: 71±6 $m^2$, 6 repetitions, time on: 3 min, time off: 90 s, (2) 6v6+GKs, n=46, 30x40m, 87±8 $m^2$, 4 repetitions, 4 min; 2 min, (3) 8v8+GKs, n=50, 40x40m, 106±6 $m^2$, 2 repetitions, 10-min, 3-min and (4) 10v10+GKs, n=62, 102x67m, 311$m^2$, 1 repetition, 30-min, 0-min. During SSGs, the ball was always available by prompt replacement when out.[6] SSGs were analysed from the start of the first to the end of the last repetition, including resting periods.[17] Since recovery periods are generally considered as a part of the overall exercise load,[18] we chose to analyse the complete exercise block as a whole (i.e., 18 to 30-min sequences, including 1 to 6 repeated SSG drills.

*Run-based high-intensity training*

To further contextualise the demands of the different SSGs and match play, we also provided, as a unique example, the locomotor demands a typical run-based high-intensity training (HIT) drill (6-min set with 15-s runs at 100% of maximal aerobic velocity interspersed with 15 s of passive recovery.)

*Locomotor Intensity Modelling*

To model the relationship between locomotor intensity and moving average durations for each of the three variables, a power law relationship[19] was used using the formula: $i = cx^n$, where $i$ is the running/mechanical load intensity, $c$ the intercept and $n$ the slope of the relationship.[11]

*Statistical analyses:*

Data in text and figures are presented as means with standard deviations (SD) and 90% confidence limits/intervals (CL/CI). All data were first log-transformed to reduce bias arising from non-uniformity error. Differences in locomotor intensity between each SSG and match activity in the different variables, as-well-as between-SSG/position differences relative to match, were examined using standardised differences (ES), based on Cohen's effect size principle. Probabilities were used to make a qualitative probabilistic mechanistic inference about the true changes/differences in the changes, which were assessed in comparison to the smallest worthwhile change (0.2 x pooled SDs). The scale was as follows: 25−75%, possible; 75−95%, likely; 95−99%, very likely; >99%, almost certain. Threshold values for standardized differences were >0.2 (small), >0.6 (moderate), >1.2 (large) and very large (>2). For simplicity and greater impact of the present results in the field only effect sizes > 0.6 with likely chances (>75%) that the differences were true were reported in tables 2 and 3.

## 4. Results

Table 1 presents slopes, intercepts and regression coefficients of the models (r = 0.94-1.00) that describe the associations between TD, HS and MechW intensity vs. rolling-average durations, for each SSG and position. Figure 3 presents the standardised differences in TD, HI and MechW intensity between each SSG and match demands for all rolling average durations and positions.

Overall, TD and HS were likely-to-most likely lower during 4v4, 6v6 and 8v8 than during matches for all positions and rolling average durations. For CD and CM, TD was likely-to-most likely higher during 10v10 than during matches for almost all rolling average durations. Unclear or trivial differences were observed in HS between 10v10 and matches for all positions. MechW was likely-to-most likely higher during 4v4 than during matches for all positions and short-duration rolling averages

(1-4-min). MechW was likely-to-most likely higher during 6v6 than during matches for CD (2-15-min) while only unclear-to-small differences were observed for all other positions. Unclear-to-small differences in MechW were observed between 8v8 and matches for WD and AM.

Table 2 presents the between-SSGs standardised differences in HS and MechW intensity as a function of rolling average durations. Overall, HS increased with increases in player numbers. HS was most likely superior for 10v10 compared with 4v4, 6v6 and 8v8 for all rolling average durations (ES: 2.79,±0.54 to 3.97,±0.53). Overall, MechW intensity decreased with increasing player numbers. MechW was very-to-most likely higher for 4v4 compared with 6v6 (1-3-min rolling average duration, ES: -1.14,±0.52 to –1.25,±0.38), 8v8 (1-4-min, -0.69,±0.39 to -1.61,±0.32) and 10v10 (1-4-min, -1.26,±0.40 to -1.96,±0.37). MechW was very-to-most likely higher for 6v6 compared with 8v8 (10-15-min, -0.64,±0.40 to -0.70,±0.29) and 10v10 (2-15-min, 0.65,±0.32 to 1.02,±0.26). MechW was very likely higher for 8v8 compared with 10v10 over 8 min (0.69,±0.35).

Table 3 presents the between-position standardised differences as a function of rolling average durations for HS and MechW intensity, for each SSG. Overall, CD covered likely-to-most likely more HS, relative to their match demands, compared with CM and AM during 6v6 for all rolling average durations (0.63,±0.81 to 1.59,±0.96) as well as likely more than WD (1-min; -0.89,±0.97) and AM (1-2 and 8-min, -0.58,±0.36 to -1.54,±1.84) during 8v8. CM covered likely more HS relative to the match than WD (3-4-min; 0.89,±1.05 to 0.95,±1.10) and likely-to-most likely more than AM (4-6-min; 0.87,±0.80 to 1.32,±1.13) during 8v8. Regarding MechW, CM worked less compared with their own matches than the other positions during 6v6. Similarly, CM performed likely-to-most likely less MechW than CD (5-15-min; 0.68,±0.72 to 1.34,±0.99) and AM (4 and 6-15-min; 0.82,±0.43 to 1.06,±0.60). CM performed likely-to-most likely less MechW than CD (1-15-min, 0.69,±0.81 to 1.11,±1.09), WD (12-15-min, 0.79,±0.77 and 0.92,±0.77 respectively) and AM (3-15-min, 0.60,±0.60 to 1.39,±0.32) during 8V8. All other between-group or between-SSGs differences in peak TD, HS or MechW were small and/or unclear.

TD and HS intensity during a typical run-based high-intensity training (HIT) session was likely slightly higher (1-min TD: 180±16 vs 186±3m; ES: 0.38,±0.37) to almost certainly very largely higher compare with the match (6-min TD: 128±12 vs 168±4m; 2.72,±0.35; HS: 36±8m vs 118±3m; 5.13,±0.37). MechW was almost certainly very largely lower (ES: -10.5,±0.37 to -7.58,±0.37) during HIT than the match.

## 5. Discussion

To our knowledge, this study is the first to compare the locomotor intensity (i.e., running activity and mechanical work) of typical SSGs with that of competitive matches in professional soccer players. The main findings of this study were: (1) Compared with matches, only 10v10 SSGs (102x67m) allowed players to reach similar running intensities (TD and HS), whereas 4v4 (25x30m; over 1-4 min) allowed the attainment of a moderately-to-largely greater mechanical work intensity, (2) The magnitude of the differences in locomotor intensity between SSGs and matches was highly position- and SSG-dependant, irrespective of the rolling average durations.

In the present study, we used a power law model to examine the relationship between running- and mechanical work intensity and time during official first league matches and a selection of typical SSGs. Interestingly, the peak running intensity reported in our study (intercept; 146.8 to 176 $m.min^{-1}$ for CD and CM, respectively) was 10- 15% lower than that reported in professional Australian A-League players,[11] despite the fact that the two teams played in a similar 4-3-3 formation. However, the actual playing style (possession vs direct- or fast-progression playing style,[20]) and playing standard (one team playing the European Champions' League vs one playing in the Australian domestic championship) may influence match running demands at a greater extend than team formations. The high technical standard of the French team players and the high possession scores during matches (>65%) is, therefore, likely to explain the differences observed between the studies.

*Differences between SSGs and match demands & Implication for Tactical Periodisation*

In the present study, we found that the overall running intensity (TD and HS) during 4v4, 6v6 and 8v8 were likely-to-most likely and slightly-to-very largely lower than during matches for all positions (Figure 2). In contrast during 10v10, TD and HS were similar or even slightly-to-moderately higher than during matches (Figure 2). This latter result confirms previous work[7,21,22] showing that increasing the number of players (and concomitantly pitch size) increases TD and HS during SSGs. In fact, an increase in relative playing area (from ~90 (4v4) to ~310$m^2$/player (10v10)) allows for more space to be covered (high TD,[23]) and in turn, higher speeds to be reached (HS,[24]). In this study, the space available for players to run increased directly with player number, so that the greater number of players, the greater the distance per minute ran. Over the past years, soccer training concepts and methodologies have evolved and one of the most contemporary training approaches in soccer is now called the "Tactical periodization".[5] With this approach, horizontal alternation of the training goals is achieved by prioritising either strength, endurance or speed focus between days rather than between exercises or microcycles. The aim of each 'conditioned' session is then to overload the desired fitness component

relative to the match demands. During an "endurance-targeted session", in parallel to a high metabolic load, coaches generally aim for a relatively high average running pace (m/min) and large activity volumes.[18] Therefore, from a pure locomotor standpoint, while the 4v4, 6v6 and to a lesser extent the 8v8 might not allow overloading the running loads of endurance-oriented sessions, the 10v10 is likely the optimal format to program during submaximal endurance-oriented sessions. Notwithstanding, the magnitude of the difference between 10v10 and matches locomotor intensity was only trivial-to-small (182 vs 180 m/min for 1-min to 121 vs 117 m/min for 15-min for SSG and matches, respectively). As such, to substantially overload TD and HS intensity over longer periods of time, specific run-based high-intensity training (HIT) drills without the ball may sometimes still need to be incorporated into training sessions (i.e., intermittent runs such as 15-s on – 15-s off; Fig 1, 118 vs 36 m/min at HS for 6 min for example, very large effect). In practice, however, coaches may also use 6v6 or 8v8 SSGs within their endurance-oriented sessions; not for their locomotor demands but because of the associated high but not maximal metabolic responses (high heart rate responses (see Hill-Haas et al.[24], Figure 3)), which were not examined in the present study), which when programmed over prolonged durations (e.g., >8 min for 6v6 and >15 min for 8v8) may help to improve the ability to maintain high work rates over time (i.e., endurance).

On the other hand, MechW intensity was likely-to-most likely higher during 4v4 than during matches for short-duration rolling averages (Figure 2). This result confirms previous work where a decrease in player numbers tended to increase player actions and changes in velocity (accelerations and decelerations),[21,22] which could, in turn, overload mechanical work intensity compared with match demands.[25] Interestingly, MechW was also higher than match demands during 6v6 for CD (but not the other positions, small and/or unclear differences, Table 3), suggesting that this format could also be used to overload MechW for this position. Since during a "strength-targeted session", coaches generally tend to overload players' neuromuscular system through increased occurrences of accelerations, decelerations and changes of directions at high intensity, present results confirm the interest of using 4v4 (and 6v6 for CD) over 3-5 min to overload this specific soccer-specific physical capacity. However, it is noteworthy that the overload in MechW intensity is likely substantial for short SSG bouts only (<5 min); as currently implemented in practice, it is therefore preferable to use short repetitions interspersed with long recovery durations (90-120 s) to promote peak MechW intensities. Finally, it is also worth noting that the metabolic responses to such SSGs are almost near-to-maximal (not measured here,[18]), which shows again that during such football-specific drills it is impossible to train physical capacities in complete isolation. These formats may however be better suited to develop

maximal aerobic 'power' than endurance per se, which explains why this SGG format fits better into locomotor 'strength-' than 'endurance-oriented' conditioned sessions.

*The magnitudes of difference between SSGs and matches are position-dependant*

Another area of concern when planning training in overall, and especially SSGs, is the possible heterogeneity of physical responses between individuals, which can cause disparities in player's weekly loading.[17] In this study, there were some substantial differences in relative locomotor intensity responses between positions (Table3). For example, relative to their respective match demands, CD performed likely moderately greater HS than CM during 6v6, while these latter players performed moderately-to-largely more HS than WD and AM during 8v8 (Table3). On the other hand, CM were moderately under-loaded for MechW during 6v6 and 8v8 compared with other positions. With these results in mind, coaches may propose regulation rules or specific exercises to unload/overload individual player groups and in turn individualise the overall training intensity and load.[13] On one hand, when the aim is to decrease running load, players can be used as floaters or positioned off the pitch as wide players.[24] On the other hand, to specifically overload a group of players, player-to-player marking could be requested.[26] Reported elsewhere, it is also worth noting that game modulation can be achieved through creating 'artificial' rule changes with players required to complete series of accelerations and decelerations before returning into the area of play,[24,27] increasing MechW intensity of the drill. However, while rule modifications in SSGs are widely used in professional football to unload or top-up specific players, their specific impact on locomotor and/or mechanical work intensity have not been clearly investigated and require further investigation. Finally, since these rule modifications may in fact lack specificity, it may be more appropriate to, at least, modify the exercise volumes for these latter specific player groups, e.g., CD performing ¾ of the game-specific part of the session and CM, additional run-based drills at the end of the session. It is however worth mentioning that the present results may be exclusively representative of the team examined here; team adopting different systems and types of play may show different match play demands,[28] which may affect, in turn, the comparisons with the SSGs examined here. It is also noteworthy that the relatively small sample size used in this study could potentially limit the confidence in the positional group comparison.

## 6. Practical applications

- 10v10 (5-15-min) SSGs can be used to slightly-to-moderately overload the intensity of match locomotor demands (TD and HS) and may be well suited for endurance-oriented sessions within a tactical periodization training paradigm.
- 4v4 (<5-min) and to a lesser extent 6v6 SSGs (2-15-min, CD) can be used to overload MechW intensity.
- SSGs are not a one size fits all training weapon when it comes to players loading. Planning position-specific unloading strategies or top-up exercises are likely required to equilibrate players loading relative to game demands when using SSGs.
- A D+1 session for substitutes that aim to compensate for a ~60-min match (TD: ~6000m; HS: ~1200m, MechW: ~50) could include the following: i) 8v8, 2sets of 10-min (1920m with 260m at HS, MechW: 11) ii) 4v4, 4 sets of 4-min (1660m, 290m at HS, MechW: 28) iii) run-based HIT (15-s on; 15-s off), 1 set of 6-min (1020m, 850m at HS, MechW: 2) resulting in a total of ~60-min training duration, ~4600m covered with ~1400 at HS and a MechW of 41

## 7. Conclusion

The locomotor intensity (i.e., running activity and mechanical load) of typical SSGs was compared for the first time with that of competitive matches in professional soccer players. We found that SSGs are not a one size fits all training weapon when it comes to players loading: peak locomotor intensity can be modulated during SSGs of various formats and durations to either over- or underload match demands. In comparison with matches, only 10v10 SSG (102x67m) allowed players to reach similar running intensities (TD and HS). Whereas, 4v4 SSGs placed the greatest and the least emphasis on MechW and HS, respectively. The present study also shows that positional roles likely modulate these SSG vs. match demands relationships, with a tendency for CD and CM to be the most and least overloaded during SSGs, respectively. This novel information can be used for training programming to individualise player loading during SSGs and improve overall training load management in elite soccer players.

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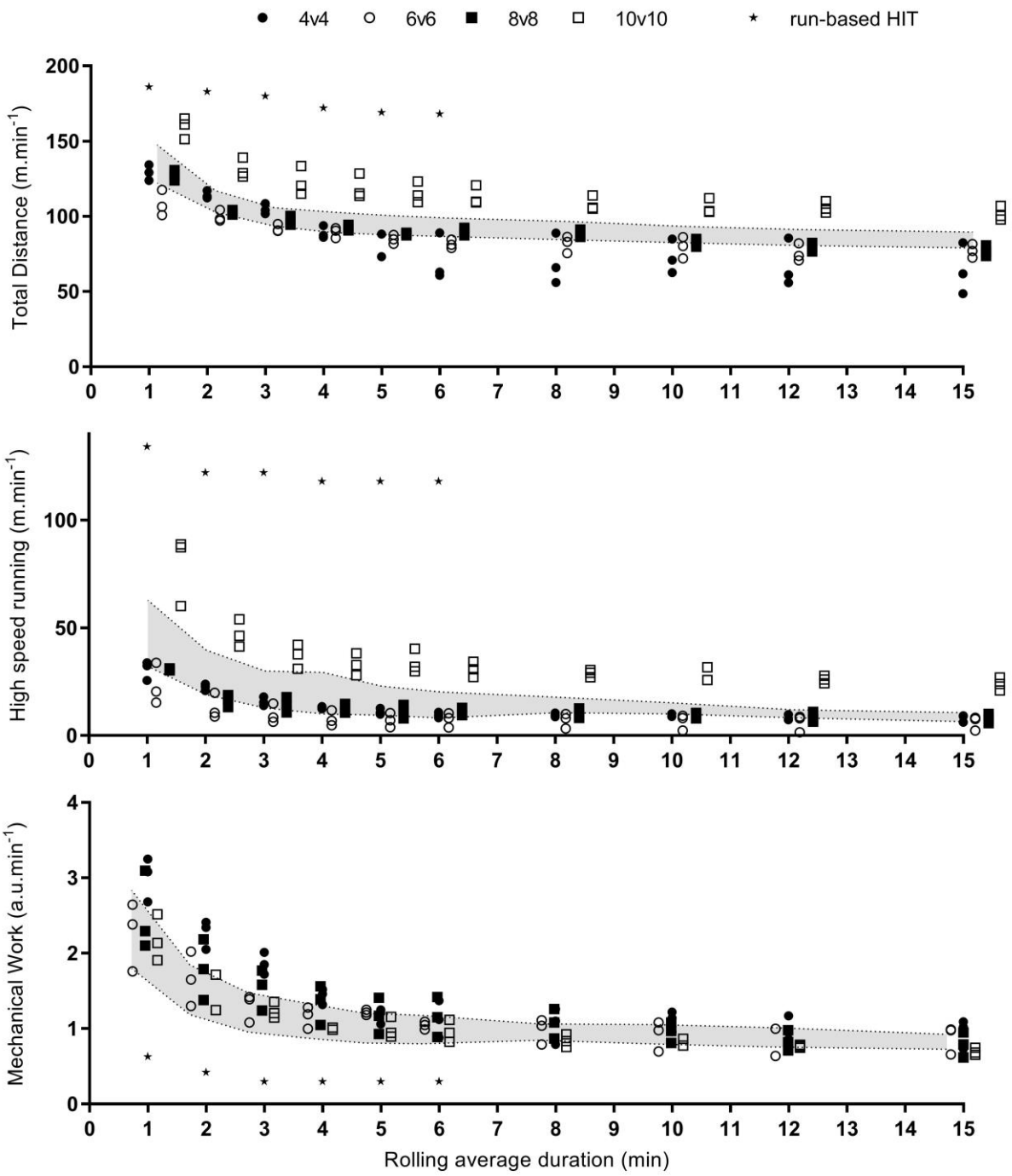
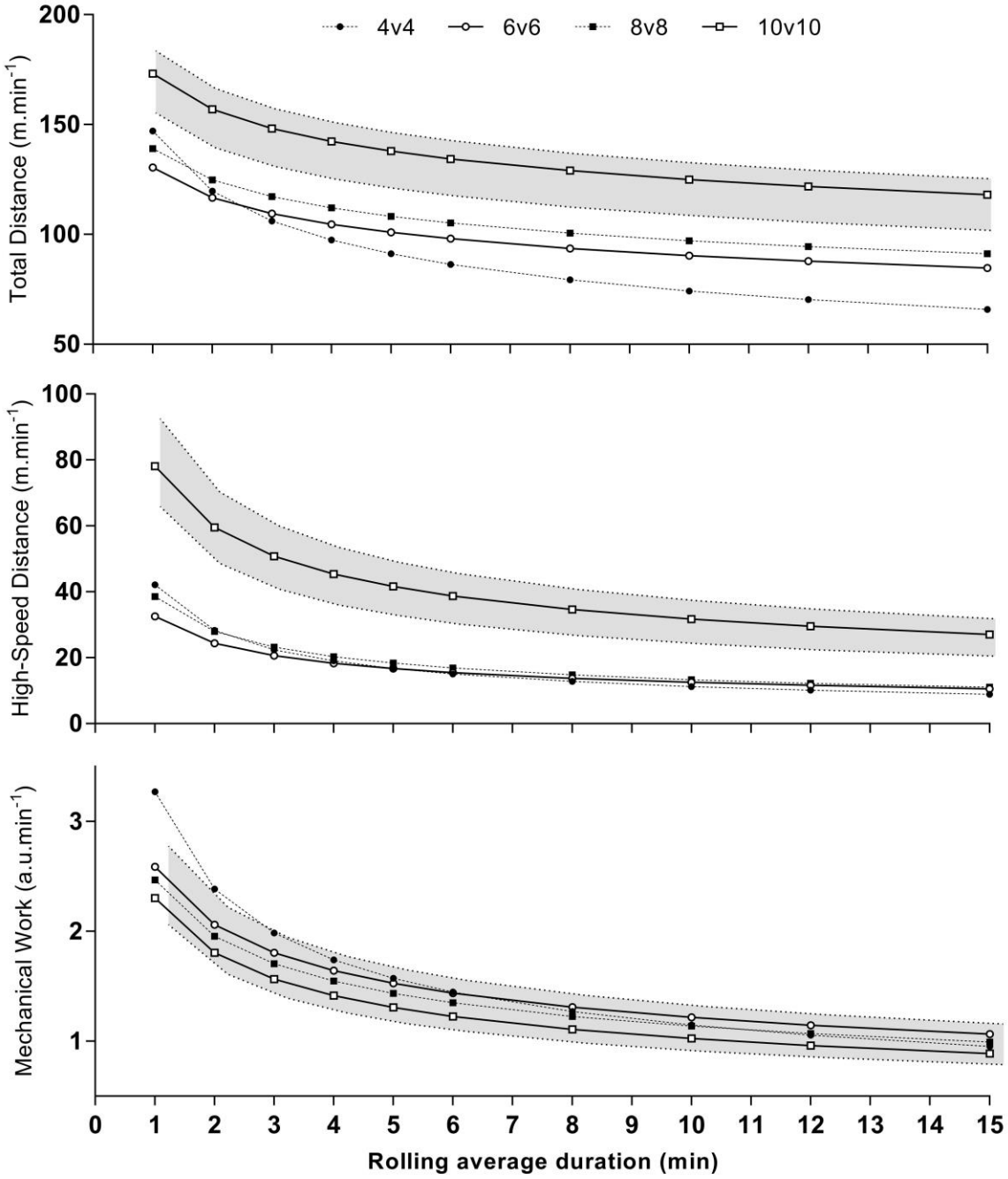
**Figure 1:**




Peak locomotor intensity during the different small-sided games compared with match demands as a function of each rolling average period, in a representative professional soccer player (grey zones stand for match average ± standard deviations).



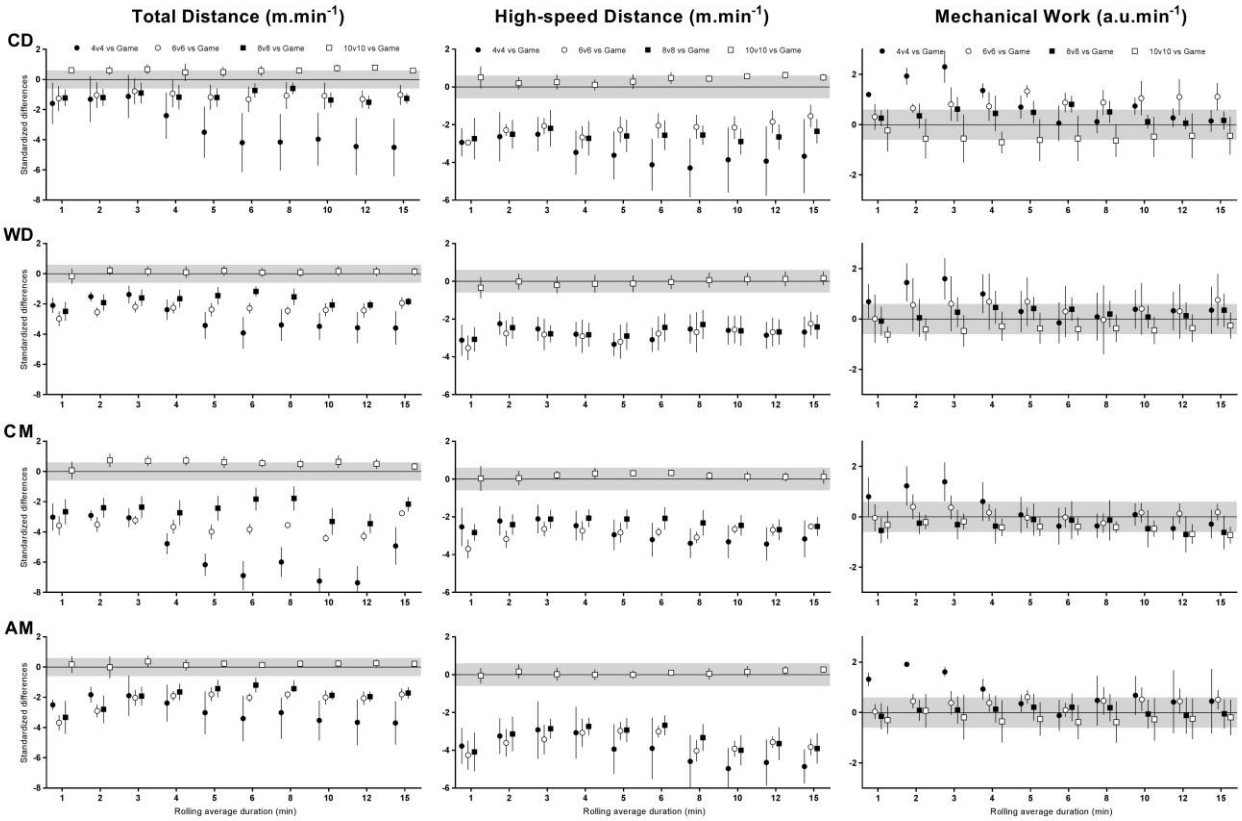

409

410 **Figure 2:**

411 Peak locomotor intensity during the different small-sided games compared with match demands as a
412 function of each rolling average period for all players pooled together (grey zones stand for match
413 average ± standard deviations). Confidence intervals for mean values are not provided for clarity.

414

415




416

417 **Figure 3:**

418 Standardised differences in total distance, high-speed running and mechanical work intensity between
419 each small-sided game (SSG) and match demands for all rolling average durations and position. Data
420 are mean ± 90% confidence intervals.

Table 1: Intercepts, slopes and regression coefficients of the models for estimating total distance (TD), high-speed running (HS) and Mechanical work (MechW) intensity by rolling-average durations, for each small sided game and position.

| | | Total Distance (m.min-1) | | | High Speed running (m.min-1) | | | Mechanical Load (a.u.min-1) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Intercept | Slope | r | Intercept | Slope | r | Intercept | Slope | r |
| CD | Match [20] | 146.8 | -0.16 | 0.98 | 59.3 | -0.46 | 0.97 | 2.1 | -0.37 | 0.99 |
| | 4v4 [5] | 133.1 | -0.34 | 0.96 | 29.0 | -0.62 | 0.98 | 3.2 | -0.49 | 0.97 |
| | 6v6 [10] | 129.6 | -0.16 | 0.98 | 28.5 | -0.38 | 0.98 | 2.3 | -0.31 | 0.98 |
| | 8v8 [12] | 129.5 | -0.16 | 0.98 | 30.9 | -0.49 | 0.99 | 2.4 | -0.38 | 0.99 |
| | 10v10 [12] | 156.9 | -0.15 | 0.98 | 63.0 | -0.43 | 0.98 | 2.0 | -0.38 | 0.98 |
| WD | Match [15] | 174.4 | -0.16 | 0.97 | 89.6 | -0.43 | 0.99 | 2.5 | -0.34 | 0.97 |
| | 4v4 [10] | 152.1 | -0.28 | 0.96 | 43.9 | -0.52 | 0.98 | 3.2 | -0.42 | 0.96 |
| | 6v6 [13] | 130.1 | -0.15 | 0.98 | 36.9 | -0.45 | 0.98 | 2.7 | -0.33 | 0.98 |
| | 8v8 [17] | 143.1 | -0.16 | 0.99 | 43.0 | -0.48 | 0.99 | 2.6 | -0.32 | 0.99 |
| | 10v10 [20] | 174.0 | -0.15 | 0.98 | 82.2 | -0.39 | 0.98 | 2.3 | -0.32 | 0.98 |
| CM | Match [16] | 176.0 | -0.13 | 0.97 | 76.6 | -0.39 | 0.97 | 2.3 | -0.33 | 0.97 |
| | 4v4 [8] | 152.3 | -0.31 | 0.94 | 45.7 | -0.61 | 0.98 | 3.2 | -0.47 | 0.94 |
| | 6v6 [12] | 137.7 | -0.17 | 0.97 | 30.3 | -0.38 | 0.97 | 2.5 | -0.35 | 0.97 |
| | 8v8 [11] | 149.4 | -0.15 | 0.99 | 40.9 | -0.44 | 1.00 | 2.3 | -0.33 | 0.99 |
| | 10v10 [17] | 181.8 | -0.12 | 0.99 | 79.8 | -0.38 | 0.98 | 2.3 | -0.37 | 0.99 |
| AM | Match [13] | 171.1 | -0.15 | 0.97 | 81.1 | -0.41 | 0.98 | 2.7 | -0.33 | 0.99 |
| | 4v4 [4] | 147.1 | -0.33 | 0.98 | 40.4 | -0.59 | 0.99 | 3.8 | -0.49 | 0.96 |
| | 6v6 [11] | 128.2 | -0.16 | 0.98 | 33.2 | -0.42 | 0.97 | 2.8 | -0.31 | 0.98 |
| | 8v8 [10] | 133.2 | -0.15 | 0.99 | 37.6 | -0.45 | 0.99 | 2.7 | -0.34 | 0.99 |
| | 10v10 [13] | 173.4 | -0.15 | 0.96 | 80.6 | -0.39 | 0.97 | 2.6 | -0.35 | 0.99 |

CD: Central defenders; WD: Wide defenders; CM: Central midfields; AM: Forwards. [n]: number of match or small-sided games observations.

Table 2: Between-small-sided games (SSGs) standardised differences in high-speed running and mechanical work intensity as a function of rolling average durations.

| Distance > 14.4 km.h$^{-1}$ (m.min-1) | SSGs | 4v4 | 6v6 | 8v8 | 10v10 | Mechanical Work (a.u.min-1) |
|---|---|---|---|---|---|---|
| | **4v4** | | 4v4 > 6v6 - [1-3] | 4v4 > 8v8 - [1-4] | 4v4 > 10v10 - [1-4, 10] | |
| | **6v6** | 4v4 > 6v6 - [1] | | 6v6 > 8v8 - [10-15] | 6v6 > 10v10 - [2-15] | |
| | **8v8** | | | | 8v8 > 10v10 - [6] | |
| | **10v10** | 10v10 > 4v4 - [1-15] | 10v10 > 6v6 - [1-15] | 10v10 > 8v8 - [1-15] | | |

Only effect sizes > 0.6 with likely chances (>75%) that the differences are true are reported. [x] : Rolling average duration.

Table 3: Between-position standardised differences as a function of rolling average durations for high-speed running (HS) and mechanical work (MechW) intensity, for each small-sided game (SSG).

| Distance > 14.4 km.h$^{-1}$ (m.min-1) | **Positions** | **CD** | **WD** | **CM** | **AM** | Mechanical Work (a.u.min-1) |
|---|---|---|---|---|---|---|
| | **CD** | | CD > WD for 4v4 [1-2]<br>CD > WD for 10v10 [1-3] | CD > CM for 4v4 - [3, 8-12]<br>CD > CM for 6v6 - [5-15]<br>CD > CM for 8v8 - [1-15] | AM > CD for 8v8 - [12]<br>AM > CD for 10v10 - [2] | |
| | **WD** | WD > CD for 4v4 - [8]<br>CD > WD for 6v6 - [1]<br>CD > WD for 8b8 - [1]<br>CD > WD for 10v10 [1] | | WD > CM for 8v8 - [12-15] | AM > WD for 4v4 - [1-2] | |
| | **CM** | CD > CM for 6v6 - [1-15] | CM > WD for 8v8 [3-4]<br>CM > WD for 10v10 [3-6] | | AM > CM for 4v4 - [1-2, 10-15]<br>AM > CM for 6v6 - [5-15]<br>AM > CM for 8v8 - [3-15] | |
| | **AM** | CD > AM for 6v6 - [1-15]<br>CD > AM for 8v8 - [1-2, 8] | WD > AM for 4v4 - [2, 5-15] | CM > AM for 4v4 - [1]<br>CM > AM for 8v8 - [4-6]<br>CM > AM for 10v10 - [4-6] | | |

Only effect sizes > 0.6 with likely chances (>75%) that the differences are true are reported. [x] : Rolling average duration. CD: Central defender; WD: Wide defender; CM: Central midfield; AM: Forwards.