**Title:** A comparison of speed profiles during training and competition in elite wheelchair rugby players

**Submission Type:** Original investigation

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## Abstract

***Purpose:*** To investigate the speed profiles of individual training modes in comparison to wheelchair rugby (WCR) competition across player classifications. ***Methods:*** Speed profiles of fifteen international WCR players were determined using a radio-frequency based indoor tracking system. Mean and peak speed ($m \cdot s^{-1}$), work-rest ratios, the relative time spent (%) and the number of high speed activities performed were measured across training sessions ($n$ = 464) and international competition ($n$ = 34). Training was classified into one of four modes: conditioning ($n$ = 71), skill-based ($n$ = 133), game related ($n$ = 151) and game-simulation drills ($n$ = 109). Game-simulation drills were further categorised by the structured duration, which were 3-minute game-clock ($n$ = 44), 8-minute game-clock ($n$ = 39), and 10-minute running-clock ($n$ = 26). Players were grouped by their International Wheelchair Rugby Federation classification as either low-point ($\leq$ 1.5; $n$ = 8) or high-point players ($\geq$ 2.0; $n$ = 7). ***Results:*** Conditioning drills were shown to exceed the demands of competition, irrespective of classification ($P \leq 0.005$; effect size [ES] = 0.6-2.0). Skill-based and game related drills under-represented the speed profiles of competition ($P \leq 0.005$; ES = 0.5-1.1). Mean speed and work-rest ratios were significantly lower during 3- and 8-minute game simulation drills in relation to competition ($P \leq 0.039$; ES = 0.5-0.7). However, no significant differences were identified between the 10-minute running-clock and competition. ***Conclusions:*** Although game-simulation drills provided the closest representation of competition, the structured duration appeared important since the 10-minute running-clock increased training specificity. Coaches can therefore modify the desired training response by making subtle changes to the format of game-simulation drills.



***Keywords:*** Speed profiles, disability sport, exercise prescription,

## Introduction

Wheelchair rugby (WCR) is an intermittent, court-based team sport played by both male and female players. Players are classified into one of seven classification groups based on their function, ranging from 0.5 (least function) to 3.5 (most function). WCR teams are composed of up to 12 players, with 4 players and a maximum of 8.0 points allowed on-court at any one time.[1] Accordingly, player classification has a large impact on team composition and player preparation.[2-3]

Knowledge about the demands of competition is necessary to aid in the design and application of competition-specific training strategies. Yet only a few studies have examined the demands of WCR competition.[3-5] While the initial investigation conducted by Sarro et al.[5] provided an important starting point, the analyses of total distance and mean speed alone are unlikely to inform the prescription of training. More recently, activities at lower levels of intensity have been shown to dominate the typical speed profile of competition.[3] While high-intensity activities contribute to only a small part of competition (~5%), players perform between 36-52 high-intensity efforts per match, each lasting between 1.7-1.9 seconds.[3] However, classification-specific requirements varied considerably during competition, with these mainly attributed to the tactical demands specific to each positional role.[3] Low-point players ($\leq$ 1.5) typically occupy defensive roles during competition, whilst high-point players ($\geq$ 2.0) tend to occupy offensive roles.[1,3-4] Subsequent work was able to further distinguish between positional roles in WCR and highlight the increased importance of peak speed and high-intensity activities for successful performance, especially in offensive players.[4] The specific requirements across player classifications and positional roles have important implications for adopting a more individualised approach to the prescription of training.

Speed profiles drawn from competition have previously been employed to aid the development of sports-specific training in a variety of able-bodied team sports.[6-15] In the available literature, a considerable disparity between training and competition has been observed, whereby training failed to replicate the typical profiles associated with competition.[8,9,10] However, it is important to acknowledge that training is typically categorised into a variety of individual modes designed with a specific objective (i.e. conditioning, skill-based, or game simulation drills), which may attribute to the over- and under-estimation of competition profiles. As such, conditioning drills are prescribed as continuous or intermittent pushing drills designed to improve the physical capabilities of

players (e.g. acceleration, top speed).[11] Skill-based drills generally employ structured ball-handling tasks that are performed at a low-intensity aimed to improve technical aspects.[12] Alternatively, game-specific drills are based on the 'specificity of practice principle' where competition-specific scenarios are prescribed and the greatest training adaptations occur when the speed profile replicates the multi-faceted demands of competition.[12-15] Simply, coaches must balance the development of physical, technical, and tactical requirements to aid in the preparation of players.

Unfortunately, the research examining WCR training is limited to two separate studies.[16,17] Barfield et al.[16] monitored the internal responses of tetraplegic WCR players ($n$ = 9) during different training modes. Conditioning drills elicited a greater heart rate response (114 ± 13.2 b·min$^{-1}$) compared to skill-based (101 ± 13.7 b·min$^{-1}$) and game simulation drills (104 ± 17.8 b·min$^{-1}$). However, a limitation of this study was that speed profiles were not available during training. More recently, Paulson et al.[17] compared the relationship between speed profiles and various internal responses to WCR training. Whilst internal responses correlated well with low speed activities, they underestimated high speed activities, which suggest that high speeds may not always reflect high internal training loads.[17] Despite this, neither of these previous studies have compared the demands of training in relation to the demands of competition, to determine the effectiveness of current training regimes.

Speed profiles derived during competition performance can be used to enhance the specificity of training for team sport athletes. Therefore it is vital that this type of research is conducted within WCR to not only optimise the performance of individual athletes but to potentially minimise their risk of injury. Subsequently, the purpose of the current study was to investigate the speed profiles of individual training modes and compare these with competition across player classifications.

## Methods

### Participants

Fifteen international WCR players (age: 28.8 ± 6.5 years; mass: 60.7 ± 9.8 kg) provided written informed consent and volunteered to participate in the current study. Approval for the study was obtained by the University's local ethical advisory committee (SSEHS-G13-P5). Players were grouped based on their International Wheelchair Rugby Federation (IWRF) functional classification as either low-point (≤ 1.5; $n$ = 8) or high-point players (≥ 2.0; $n$ = 7).

## Equipment

Speed profiles were assessed during training and competition using a radio-frequency based indoor tracking system (Ubisense, Cambridge, UK) as previously described and validated.[18,19] Each player was equipped with a small, lightweight tag (size = 40 x 40 x 10 mm; mass = 25 g) sampling at 8 Hz, positioned on or near the foot-strap of each players rugby wheelchair (Fig 1). Each player wore the same tag during all testing sessions to exclude any potential tag variability.

***INSERT FIGURE ONE***

## Training Analyses

Training was monitored over a 3-month period during the competitive phase of the season. Data were collected from a total of 31 individual court-based training drills ($n$ = 464 observations) developed by the coaching staff and classified into one of four modes of training, based on the primary purpose of the drill:

- Conditioning drills ($n$ = 71 observations) – classification specific, continuous full court (28 x 15m) pushing drills used to improve the physical capabilities of players.
- Skill-based drills ($n$ = 133 observations) - structured ball-handling tasks on a reduced court size, involving interactions between classifications.
- Game related drills ($n$ = 151 observations) - game-specific tactical plays on half a court with coach interaction.
- Game simulation drills ($n$ = 109 observations) – full court drills intended to replicate competition conditions (i.e. 4 vs. 4 structure and typical game regulations).

A key manipulation to game simulation drills was the structured duration of the drills. Subsequently, these were further categorised into the different variations used, which were 3-minute game-clock ($n$ = 44 observations), 8-minute game-clock ($n$ = 39 observations), and 10-minute running-clock ($n$ = 26 observations). During game-clock variations, timing was stopped when a goal was scored, the ball was out of bounds, or a foul/violation was committed. Whereas during the running-clock variation, timing continued throughout the allotted time (10 minutes). Before each training session, players performed a 20-minute standardised warm-up involving moderate- to high-intensity continuous pushing, dynamic

stretching and maximal linear sprints. Warm-up activity was not included in any training analyses.

Training speed profiles were compared with the speed profiles collected during 5 competitive matches over an international tournament with the same group of players ($n$ = 34 match observations). Mean and peak speed ($m \cdot s^{-1}$) was determined for each player. Relative time spent in five arbitrary speed zones, which were based upon the percentage of each player's mean peak speed attained during game simulation drills played throughout the collection period, was calculated. The percentage thresholds as previously used in team sports[20] were, very low (< 20%), low (21-50%), moderate (51-80%), high (81-95%) and very high (> 95%). These thresholds were subsequently used to calculate the ratio of time spent performing work (moderate, high and very high speed zones) in relation to rest (very low and low speed zones) to determine the work-rest ratios (W:R). The relative time spent in high and very high speed zones and the relative number of these activities were also analysed. A match observation was characterised for each individual by the accumulation of activity collected during the respective four quarters of that match. Speed profiles were therefore presented as the mean of all match observations for each individual player.

**Statistical Analyses**

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS version 21, Chicago, IL). Descriptive statistics (mean ± SD) were calculated for each participant for all parameters. Normality and homogeneity of variance was confirmed by Shapiro-Wilk and Levene's tests respectively. Mixed linear modelling was applied to account for the unbalanced design.[21] Main effects and interactions were accepted as statistically significant whereby $P \leq 0.05$. Pairwise comparisons were utilised to explore any significant interactions between training mode and competition across player classifications (low-point vs. high-point players). Effect sizes (ES) were calculated as the ratio of the mean difference to the pooled standard deviation of the difference.[22] The magnitude of ES was classed as trivial (< 0.2), small (0.2-0.6), moderate (0.6-1.2), large (1.2-2.0), and very large (≥ 2.0) based on previous guidelines.[22]

## Results

Table 1 demonstrates the differences in speed profiles during the individual training modes in comparison to competition.

***Conditioning drills.*** The mean speed and work-rest ratios of conditioning drills significantly ($P \leq 0.0005$; ES = 1.2-1.5) exceeded competition (Table 1). The time spent performing high and very high speed activities and the relative number of high speed activities performed were all significantly greater during these drills than competition ($P \leq 0.0005$; ES = 0.6-2.0).

***Skill-based drills.*** Mean speed, peak speed and work-rest ratios were all lower during skill-based drills ($P \leq 0.0005$; ES = 0.6-2.0) compared to competition (Table 1). Time spent at high speeds and the relative number of high speed activities were both significantly lower than during competition ($P \leq 0.027$; ES = 0.6-1.2). A significant interaction was identified for mean speed, whereby high-point players averaged significantly lower speeds compared to competition ($P \leq 0.002$; ES = 1.3). The relative number of high-intensity activities were comparable to competition in low-point players, yet significantly lower in high-point players ($P \leq 0.0005$; ES = 1.4).

***Game related drills.*** Mean speed, peak speed and work-rest ratios were all significantly lower compared to competition ($P \leq 0.0005$; ES = 0.8-1.4). All high speed activities were significantly lower in relation to competition ($P \leq 0.0005$; ES = 1.0-1.4). A significant interaction between classification and competition was identified for high ($P = 0.002$; ES = 1.0) and very high speed activities ($P = 0.039$; ES = 0.9), whereby low-point players spent less time in these zones in relation to competition.

***Game simulation drills.*** Although no main effect was identified with respect to competition (Table 1), a significant interaction was observed for peak speed ($P = 0.023$; ES = 0.7) and work-rest ratio ($P = 0.002$; ES = 0.9). Compared to competition, low-point players spent significantly less time performing high ($P = 0.039$; ES = 0.7) and very high speed activities ($P = 0.039$; ES = 0.6). The relative number of high speed activities were comparable to competition for high-point players, but significantly lower in low-point players ($P = 0.032$; ES = 1.0).

***INSERT TABLE 1***

Table 2 demonstrates the differences in speed profiles observed during the different structured durations of game simulation drills compared to competition.

*3-minute variation.* Mean speed, peak speed and work-rest ratios were all significantly lower ($P \leq 0.039$; ES = 0.5-0.6) in relation to competition (Table 2). High speed activities were all significantly lower than competition ($P \leq 0.005$; ES = 0.7-0.8). High-point players averaged

significantly lower speeds compared to competition ($P \leq 0.0005$; ES = 0.9-1.0). Low-point players failed to replicate the peak speeds observed during competition ($P \leq 0.0005$; ES = 1.3). Further interactions were observed for the time spent in the high speed zone ($P \leq 0.003$; ES = 0.8-1.1).

*8-minute variation.* Mean speed, work-rest ratios and the relative number of high speed activities performed were significantly lower compared to competition ($P \leq 0.039$; ES = 0.6-0.7). Significant interactions were identified between classification and competition for the relative number of high speed activities performed, which were comparable to competition for high-point players, but significantly lower in low-point players ($P = 0.007$; ES = 1.1).

*10-minute variation.* No significant main effects were identified between the 10-minute game-simulation drills and competition (Table 2). Significant interactions revealed high-point players averaged significantly lower speeds compared to competition unlike low low-point players ($P = 0.008$; ES = 0.8).

***INSERT TABLE 2***

## Discussion

Conditioning drills were shown to exceed the demands of competition whereas neither skill-based nor game related drills replicated the speed profiles of competition. Game simulation drills offered the closest representation of competition, as determined by comparable profiles. However, this was dependant on the structured duration of the drill, as the 10-minute running clock manipulation led to an improvement in training specificity. Finally, classification-specific interactions were identified during individual training modes, specifically skill-based and game related drills were identified.

Court-based conditioning drills were found to replicate, if not on most occasions exceed competition for all speed-based parameters irrespective of player classification. Consistent with observations in able-bodied team sports,[7,10] the goal of conditioning drills was to place a large emphasis on the volume of activity and the time spent performing high speed activities in relation to competition. However, it must be reiterated that 'high speed' activities do not always equate to high internal training loads.[17] Performing static blocking manoeuvres or repeated accelerations without reaching high speeds may have a greater

physiological cost than maintaining continuous, high speed activity when the wheelchair already has momentum. This must be considered when monitoring the 'intensity' of any training drill and internal load monitoring should also be considered to support the speed profiles reported here.[17] The current data illustrate that conditioning drills provide an appropriate training stimulus to progressively overload athletes since speed profiles during these drills were higher than observed during competition. Whilst it was previously suggested that low ranked WCR teams lack the physical capacity to maintain performance during competition,[4] this finding should encourage WCR coaches and practitioners to prescribe conditioning-based strategies, at least amongst low ranked teams. However, coaches must be aware of the balance between physical improvement and overreaching when prescribing high-speed training.[8] Although increases in training have previously been associated with overreaching[23,24] and injury[25] in able-bodied sports, little is known surrounding the optimum exercise prescription for WCR training. Nevertheless, other demands of competition, specifically ball-handling and player interaction, are notably absent from conditioning drills. Therefore, additional means are required that prepares players for the technical and tactical elements of competition.

Although skill-based drills do place an emphasis on ball-handling and interaction with team-mates, the current study found a reduced work-rest ratio combined with lower peak speeds and high speed activities performed in relation to competition. The reduced work-rest ratio can be explained by the 'closed' nature of such drills,[12] which typically focus on one discreet skill at a time. As such, skill-based drills permit additional recovery time while players wait for their turn to perform a task, resulting in prolonged static periods. Furthermore, the comparably low peak speeds and high-intensity activities most likely reflect the size of the playing area of these drills, with players unlikely to sustain such activities within reduced court dimensions. Differences in skill-based drills may be better reflected by quantifying the technical requirements (e.g. ball-handling) rather than the speed profiles alone. Nevertheless, skill-based drills are recommended during the progression of pre-season training, as training becomes more specific and represents a transitional shift towards the competitive phase of the season. This enhances skill refinement of ball handling and also the development of teamwork amongst players.

The comparably low speed profiles observed during skill-based drills was not specific to all players. Despite the lower peak speed values, low-point players accumulated a comparable amount of high speed activity in relation to competition. Such results may be

attributed to the fact that players perform these drills collectively as a squad. Consequently, the demands of skill-based training may be greater for low-point players who must work harder to keep up with their functionally more able team-mates. Coaches should therefore be aware that when training as a collective squad, skill-based drills may increase the risk of overreaching in low-point players if the increased activity is not acknowledged for these individuals. However, alternative training modes are required to provide the additional stimulus necessary to prepare high-point players for the demands of competition.

Game related drills provide additional means to expose players to competition-specific scenarios that are not present in skill-based drills.[12] However, compared with competition, game related drills were characterised by considerably less high speed activities. This may partially be explained by the intermittent breaks during game related drills for coaching intervention. Such breaks were included in the current analyses to reflect the actual demands experienced by the players for that training mode. In addition, our findings were able to distinguish classification-specific interactions during game related training. Compared to competition, high-point players were observed to spend comparable time performing high and very high speed activities with lower values observed for low-point players. The positional-roles specific to WCR may be attributed to such results,[3,4] whereby these drills typically overemphasize positional-roles. As such, high-point players are continuously required to perform offensive actions (e.g. attacking the key) whilst low-point players typically maintain static blocking positions to simulate an important defensive duty. Whilst it was clear that these drills do not reproduce the speed profiles observed in competition, the refinement of tactical plays and game strategies are a crucial element of these drills for the competitive training phase in WCR.

Game simulation training offered the closest representation of competition speed profiles, as players performed similar volumes of activity in relation to competition, and completed a comparable number of high speed activities. Collectively, game simulation drills promote the physical adaptations that adequately meet the demands of WCR competition. Although specific training objectives alter throughout the season, the ultimate goal of the competitive phase should be to induce similar stressors to that encountered during competition.[6,8,12] Hence, the reason why the main focus of training within the current study was centred on game-simulation drills (43.3% of total training time). Again, classification-specific interactions were identified. Low-point players were observed to achieve significantly lower peak speeds and spend less time performing high and very high speed

activities in relation to competition. Given the importance of game simulation drills in developing all facets of competition, current drills may fail to adequately prepare all players for the highest level of competition.

The manipulation of duration introduced large differences between game simulation drills. Irrespective of player classification, reducing the duration to 3-minute quarters restricted the opportunity to replicate the work-rest ratio and high speed activities of competition. In addition, the mean and peak speed values were found to be lower compared to competition in high-point and low-point players respectively. Although the mean speed was similar between 8-minute simulations and competition, high speed activities were performed less frequently compared to competition. Nevertheless, the resultant variation of the 10-minute manipulation led to an observed improvement in training specificity. Such findings could be attributed to the addition of a running-clock as opposed to a game-clock used in the 3- and 8-minute variations. The stopped time during a game-clock typically represents approximately 50% of the total duration, which equates to ~120 interruptions in play.[5] Consequently, the period of recovery is likely to be longer during a game-clock format, as players are more likely to stop or 'coast' during these paused periods. From a practical perspective, coaches could therefore increase the specificity of game simulation drills by the inclusion of a running-clock format as this was shown to provide comparable speed profiles in relation to competition.

**Practical Applications**

The findings of this study highlight the potential to improve the training specificity of WCR players. Our results showed the progressive overload required to improve physical conditioning in WCR players is provided by conditioning drills. Coaches should be aware that the speed profiles of skill-based and game related drills are substantially lower than competition. Future work is required to alter the conditions, design, or complexity of game simulation drills to provide an appropriate training stimulus for WCR. The data presented here illustrate the addition of a running-clock time stipulation can assist in advancing training specificity by providing a comparable speed profile to competition.

The present data is only representative of the international squad that were investigated over a 3-month period. As these training patterns are a consequence of the coaching staff, it is likely that each individual squad will have a contrasting training strategy.

With this in mind, the current findings may not be representative of the WCR population across different phases of the season.

## Conclusion

Conditioning drills specific to WCR training exceeded the demands of competition irrespective of classification. Yet both skill-based and game related drills were classification-dependant, attributed to the varying positional-roles of defensive (low-point) and offensive (high-point) players. Although game simulation drills provided the closest representation of competition, the structured duration appeared important since the 10-minute running-clock increased training specificity through elevated speed profiles.

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**Figure 1 –** Positioning of the tags on the foot strap of the wheelchair used for data collection

**Table 1.** Speed profiles (mean ± SD) during individual training modes in relation to player classification

| | Conditioning | | | Skill-based | | | Game Related | | | Game Simulation | | | International Competition | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Low-point** (*n* = 24) | | **High-point** (*n* = 47) | **Low-point** (*n* = 60) | | **High-point** (*n* = 73) | **Low-point** (*n* = 49) | | **High-point** (*n* = 102) | **Low-point** (*n* = 51) | | **High-point** (*n* = 58) | **Low-point** (*n* = 16) | **High-point** (*n* = 18) |
| **Activities** | | | | | | | | | | | | | | |
| Mean Speed (m·s⁻¹) | 1.32 ± 0.46* | # | 1.98 ± 0.63* | 1.02 ± 0.36 | #† | 0.99 ± 0.36* | 0.72 ± 0.26* | # | 1.05 ± 0.28* | 0.98 ± 0.13 | | 1.22 ± 0.13 | 1.04 ± 0.14 | 1.32 ± 0.11 |
| Peak Speed (m·s⁻¹) | 3.22 ± 0.76 | | 3.90 ± 0.62 | 2.44 ± 0.58* | # | 2.60 ± 0.76* | 2.82 ± 0.46* | # | 3.51 ± 0.46* | 3.18 ± 0.34* | † | 3.89 ± 0.43 | 3.41 ± 0.33 | 3.82 ± 0.23 |
| Work-rest Ratio (W:R) | 1:2.4* | # | 1:1.5* | 1:7.5* | # | 1:11.2* | 1:17.2* | # | 1:7.1* | 1:4.5 | † | 1:4.2* | 1:3.8 | 1:3.4 |
| **High Speed Activities** | | | | | | | | | | | | | | |
| High (%) | 7.6 ± 3.6* | # | 18.0 ± 13.0* | 2.0 ± 3.9 | #† | 1.1 ± 2.5* | 0.9 ± 1.4* | #† | 1.7 ± 1.5 | 2.1 ± 1.4* | † | 2.2 ± 1.1 | 3.1 ± 1.6 | 2.3 ± 0.6 |
| Very High (%) | 1.9 ± 3.3* | # | 4.3 ± 4.1* | 0.5 ± 1.9 | | 0.4 ± 1.3 | 0.2 ± 0.6* | #† | 0.3 ± 0.7 | 0.4 ± 0.7* | † | 0.8 ± 0.7 | 0.9 ± 0.9 | 0.7 ± 0.5 |
| Relative Number (n·min⁻¹) | 2.2 ± 1.1* | # | 3.6 ± 2.4* | 0.6 ± 1.2 | #† | 0.2 ± 0.5* | 0.2 ± 0.4* | # | 0.4 ± 0.3* | 0.6 ± 0.4* | † | 0.6 ± 0.3 | 1.0 ± 0.4 | 0.7 ± 0.1 |

*Note:*
# = significant main effect between training mode and competition.
† = significant interaction between player classification and competition.
* = significant difference to competition.

**Table 2.** Speed profiles (mean ± SD) during game simulation manipulations in relation to player classification

| | 3-minute (game clock) | | | 8-minute (game clock) | | | 10-minute (running clock) | | | International Competition (game clock) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Low-point** (*n* = 48) | | **High-point** (*n* = 77) | **Low-point** (*n* = 43) | | **High-point** (*n* = 59) | **Low-point** (*n* = 21) | | **High-point** (*n* = 42) | **Low-point** (*n* = 16) | **High-point** (*n* = 18) |
| **Duration (min)** | 6.15 ± 0.15 | | | 15.05 ± 1.28 | | | 10.01 ± 0.11 | | | | |
| **Activities** | | | | | | | | | | | |
| Mean Speed ($m \cdot s^{-1}$) | 1.00 ± 0.11 | #† | 1.20 ± 0.15* | 0.96 ± 0.10* | # | 1.24 ± 0.11* | 1.01 ± 0.08 | † | 1.23 ± 0.11* | 1.04 ± 0.14 | 1.32 ± 0.11 |
| Peak Speed ($m \cdot s^{-1}$) | 3.04 ± 0.34* | #† | 3.74 ± 0.37 | 3.29 ± 0.29 | | 4.03 ± 0.27 | 3.35 ± 0.12 | | 3.97 ± 0.28 | 3.41 ± 0.33 | 3.82 ± 0.23 |
| Work-rest Ratio (W:R) | 1:4.5* | # | 1:4.4* | 1:4.7* | # | 1:4.1* | 1:4.4 | | 1:3.8 | 1:3.8 | 1:3.4 |
| **High Speed Activities** | | | | | | | | | | | |
| High (%) | 1.9 ± 1.3* | #† | 2.0 ± 0.8 | 2.3 ± 1.2* | † | 2.5 ± 0.7 | 2.9 ± 1.1 | | 2.5 ± 0.8 | 3.1 ± 1.6 | 2.3 ± 0.6 |
| Very High (%) | 0.3 ± 0.5* | † | 0.8 ± 0.7 | 0.4 ± 0.4* | † | 0.9 ± 0.6 | 0.8 ± 0.7 | | 1.0 ± 0.6 | 0.9 ± 0.9 | 0.7 ± 0.5 |
| Relative Number ($n \cdot min^{-1}$) | 0.4 ± 0.4* | # | 0.5 ± 0.3* | 0.6 ± 0.3* | #† | 0.7 ± 0.2 | 0.9 ± 0.3 | | 0.7 ± 0.3 | 1.0 ± 0.4 | 0.7 ± 0.1 |

*Note:*

# = significant main effect between duration manipulation and competition.

† = significant interaction between player classification and competition.

* = significant difference to competition.