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A Temporal Analysis of the u48kg Women's Judo in the 2010 World Championships

Abstract
Developing an understanding of the work to rest ratios and the contribution of different technical components within a contest can assist coaches in developing training methodology that is time affective.This study aimed to develop an understanding of the under 48kg division.
Pre-recorded footage was coded into temporal sequences. The results showed that on average there were 12.3 temporal blocks (hajime-matte) per contest, this was divided into kumi kata (32%), attack/defend (26%), transition/ newaza (19%) and matte (23%) of the contest. Furthermore the average duration of the contest, including matte blocks was 5.53minutes. Some of the results of this study concur with previous research.

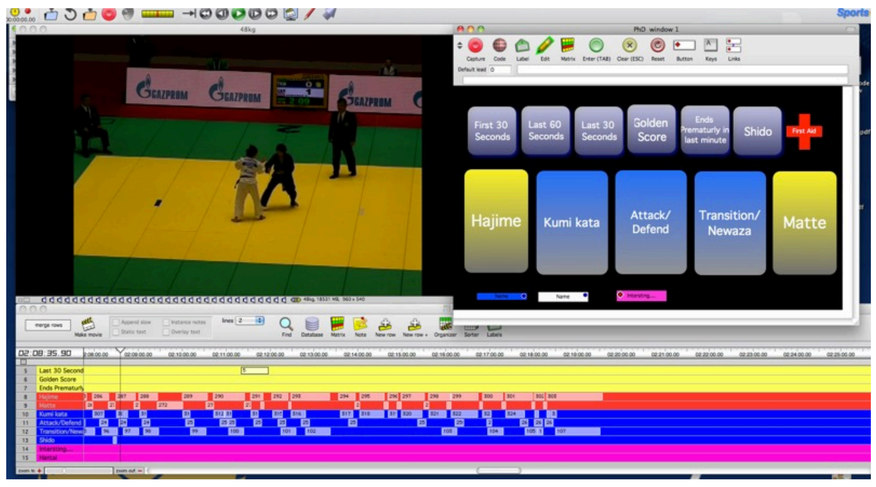
Introduction

In 1964 judo became and Olympic sport for men and although it was not included in the following Olympics it has been since 1972.
A major development in judo was the inclusion of women in the 1992 Barcelona Olympic games. Women had the same number of weight categories as men and therefore could yield the same number of medals.They had been included on the 1988 Seoul Olympic games as a demonstration event.
Contests for both men and women can be up to five minutes in duration and can include extra time (golden score) of an additional 3 minutes. Developing an understanding of the work to rest ratios and the contribution of different technical components within a contest can assist coaches in developing training methodology that is time affective. Whilst the components of a contest have been studied previously there is little research that focuses solely on women's judo and therefore this study aimed to develop an understanding of the under 48kg division.

Method

Pre-recorded footage of the 48 fights contested in the 2010 world judo championships under 48kg division was coded using sportscode elite performance analysis software (Sportstec, Australia) into temporal sequences of hajime-matte blocks. These blocks were then subdivided into kumi kata (Gripping), attacking/ defending and ne waza (groundwork).
A 'coding window' was developed by the researcher using sportscode Elite software (Sportstec, Austrailia) on an imac desktop computer (Apple, US). Figure 1 show an example of the coding window.

Figure 1: Screen shot of sportscode being used to analyse the u48kg weight group. On the right hand side is the coding window that was developed for this temporal analysis.



The kumi kata phase included lead grip and main grip and therefore started at hajime and ended on the first attack or matte.
Newaza included the transitional phase from nage waza.

Selected References

Marcon, G., Franchini, E., Jardim, J.R. and Barros Neto, T.L. (2010) Structural Analysis of Action and Time in Sports: Judo. *Journal of Quantitative Analysis in Sports.* 6: (4)

Sikorski, W. (2010). Identification of judo contest from physiological viewpoint. *Journal of Combat Sports and Martial Arts*. 2(2):1 115-118

Sterkowicz, S. (1999). Differences in the Specific Movement Activity of Men and Women Practising Judo. *Journal of Human Kinetics.* 1, 99-113.

Results

The results showed that on average there were 12.3 temporal blocks (hajime-matte) per contest. The average duration of this block was 28.7 seconds. These were divided into kumi kata (32%), attack/defend (26%), transition/newaza (19%) and matte (23%) of the contest. Furthermore the average duration of the contest, including matte blocks was 5.53minutes.

Figure 2: Chart showing the breakdown of a hajime-matte block

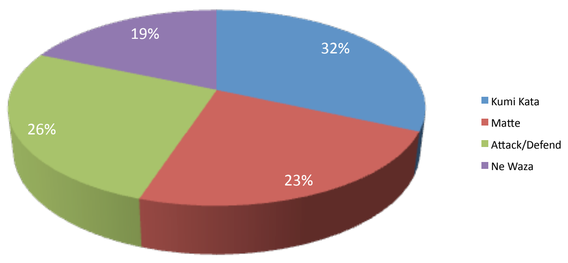
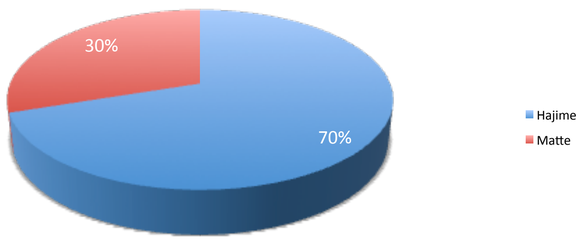


Figure 3: Percentage of time in Hajime (work) and Matte (recovery)



Discussion and Conclusion

The initial conclusion that there were 12.3 temporal segments per contest concurs with the conclusions of other authors such as Sterkowicz (1999) and Marcon et al (2010) who suggested 12 and 11 segments respectively.
The duration of the segments is similar to the finding of Sterkowicz (1999) who suggested they were between 15-30s. However, Sikorski (1987 & 2010) suggests mean segment time was no more than 25s.
Studies of what occurs within each segment is limited. Of particular interest is the study by Marcon *et al* (2010), the authors considered four sections of the work segment as preparation, grip, technique & groundwork they also considered the recovery period (matte). This is similar to how this author views the structure of the contest as lead grip, main grip, attack/defend/ counter, transition, ne waza; although for the purpose of this study lead grip and main grip were combined as were transition and ne waza. Marcon *et al* suggested that preparation was 12.6%, grip was 51.3%, technique was 4%, ne waza was 14.3% and matte was 18% of a segment. As this study combined preparation and grip into 'kumi kata' the studies show vastly different results with this study suggesting 32% and Marcon *et al* suggesting 63.9% of each segment. It is unknown why this discrepancy is so large but could possibly be to do with how the authors defined this section or possibly that the u48kg spend much less time in kumi kata.
The only other known study of time spent in kumi kata, attacking/defending and ne waza is that of Boguszewski & Boguszewska (2006) who did break down the structure of the contest from a time perspective but used 10s segments and therefore the data is not comparable. Of particular note Sterkowicz (1999) compared male and female competitors in the 1996 Olympic games. Whilst this data is useful it should be used with caution as since these games there has been a number of changes to the rules and contest duration, including females contest time increasing to 5mins from 4mins and the introduction of golden score.
Figure 3 shows the work:rest ratio for the average contest as 7:3, this information could be used for programming and future research could focus on whether these ratios differ by gender and by weight group.
In conclusion the duration and number of segments appears to agree with the published literature and is increasingly seems established. Whilst further research could be conducted comparing gender and weight category possibly a more pressing issue is the exact construct of these segments and how they differ between gender and weight group.