

HEART RATE SYNCHRONISATION OF DRESSAGE HORSE AND RIDER DURING WARM UP PERIOD FOR A COMPETITION DRESSAGE TEST

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Much of the performance outcome in equestrian sport relies on the harmony in effort between horse and rider. This study considers one aspect of this harmony in relation to the sport of dressage by investigating the physiological indicator of heart rate. Heart rate is a conventional measure of physical exertion of both equine and human athletes. However, previous research in the equestrian sport area has focused typically on either the human member or the equine member as individuals. For example, while Hama, Yogo & Matsuyama (1996) investigated the heart rate of horse and human, the relationship between their heart rates was not assessed. The synchronisation between horse and rider is assessed in this study by measuring their heart rates simultaneously, as they need to be working together to attain the best performance. Bridgeman and Pretty (2005) have shown interesting patterns of horse and rider heart rate synchronicity during a dressage test at the training and competition environments. This investigation reports a small portion of this larger research program examining heart rate in the equestrian team.

The heart rates of eleven equestrian teams were analysed during the 20-minute warm up period directly prior to the competition dressage test. Heart rate was monitored using a polar s610 coded receiver utilising a T52H coded transmitter for the horse and T61 coded transmitter for the rider. Both heart rate monitors are coded to stop the cross talk or interference with each other. The heart rate data was collected at each .05-second interval across the 20-minute warm-up period. The heart rate data was downloaded on to a computer using Polar Horse Trainer SW 3.0 then transferred to excel for preparation for analysis. The analysis of Pearson coefficients was conducted using SPSS V 11 computing program.

The results show significant ($p \leq .01$) correlation in the coefficients ($r = .36$ to $.87$) overall for the equestrian teams. However, there were different strengths of coefficients, indicating the individuality of the relationship within each equestrian team during warm-up. This individuality of equestrian teams concurs with the findings of Bridgeman and Pretty (2005) of heart rate synchronisation during a dressage test at training and competition. The synchronisation of heart rate for each team indicates the importance of investigations into both horse and rider in the same research during sporting activities. These results demonstrate that heart rate is a useful indicator of horse and rider physiological synchronisation during the warm-up period prior to a dressage test. However, this study did not have the scope to interpret the sources of heart rate variation or propose why some teams have a lower coefficient compared to others

This study shows that horses and riders display heart rate synchronisation during the warm-up period prior to a competition dressage test. Implications of these findings for pre-competition preparation and training are discussed, and further research to determine the possible behavioural, physiological, and psychological factors influencing heart rate synchronisation is considered.

BRIDGEMAN, D. J., & PRETTY, G. M. (2005). Exploring heart rate as an indicator of synchronisation between dressage horse and rider at training and competition. *ISSP 11th World Congress of Sport Psychology*, Sydney, Australia

HAMA, H., YOGO, M., & MATSUYAMA, Y. (1996). Effects of stroking horses on both humans' and horses' heart rate responses. *Psychological Research*, 38, 66 - 73.