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Acute physiological, affective and enjoyment responses to apparatus-free protocols of high-intensity intermittent exercise in inactive females

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INTRODUCTION

- Perceived lack of time most commonly reported barrier to regular physical activity (Salmon et al., 2003; Cerin et al., 2010)
- High-intensity intermittent exercise (HIIE) is posed as a time-efficient physical activity strategy (Gillen & Gibala, 2014)
- Many HIIE protocols are high-intensity intermittent cycling-based and so require specialised apparatus (braked cycle ergometer)
- Access to facilities and enjoyment are positive correlates whilst perceived effort is a barrier to regular physical activity (Troost et al., 2002)
- Biddle & Batterham (2015) propose likely aversive psychological responses which may limit sustainable adoption of HIIE

AIM



To determine if apparatus-free HIIE elicits similar acute physiological responses and more positive affective and enjoyment responses compared with traditional, apparatus-based HIIE in inactive females.

METHODS



- 18 inactive females (35 ± 11 years, $25.5 \pm 4.1 \text{ kg} \cdot \text{m}^2$, $1244 \pm 694 \text{ MET minutes} \cdot \text{week}^{-1}$)
- Within-subject, counterbalanced, crossover design of 4x30 seconds high-intensity intermittent cycling/squats/star jumps



Standardised breakfast

2 hour rest period

Exercise condition

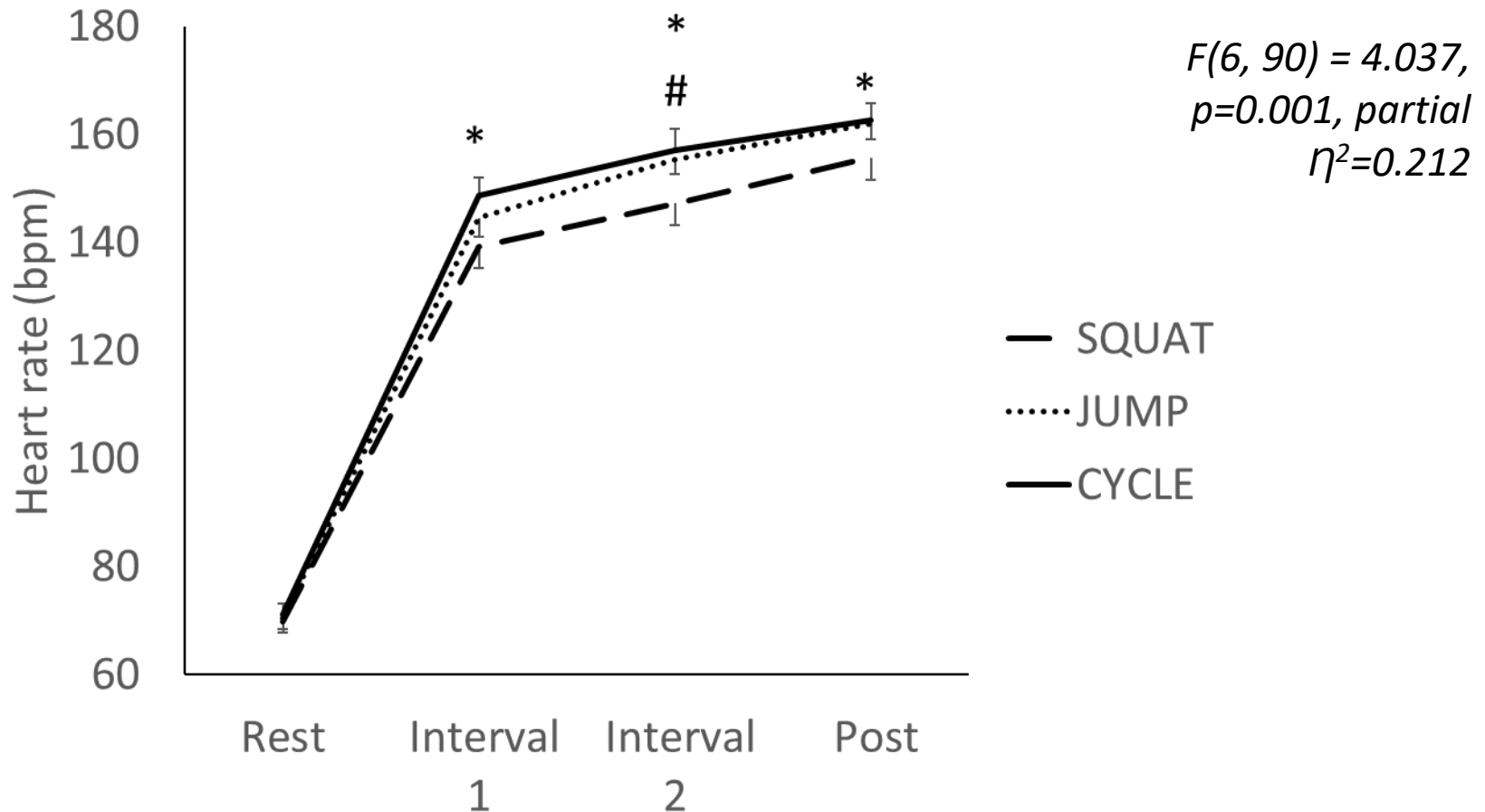
30 minutes rest period



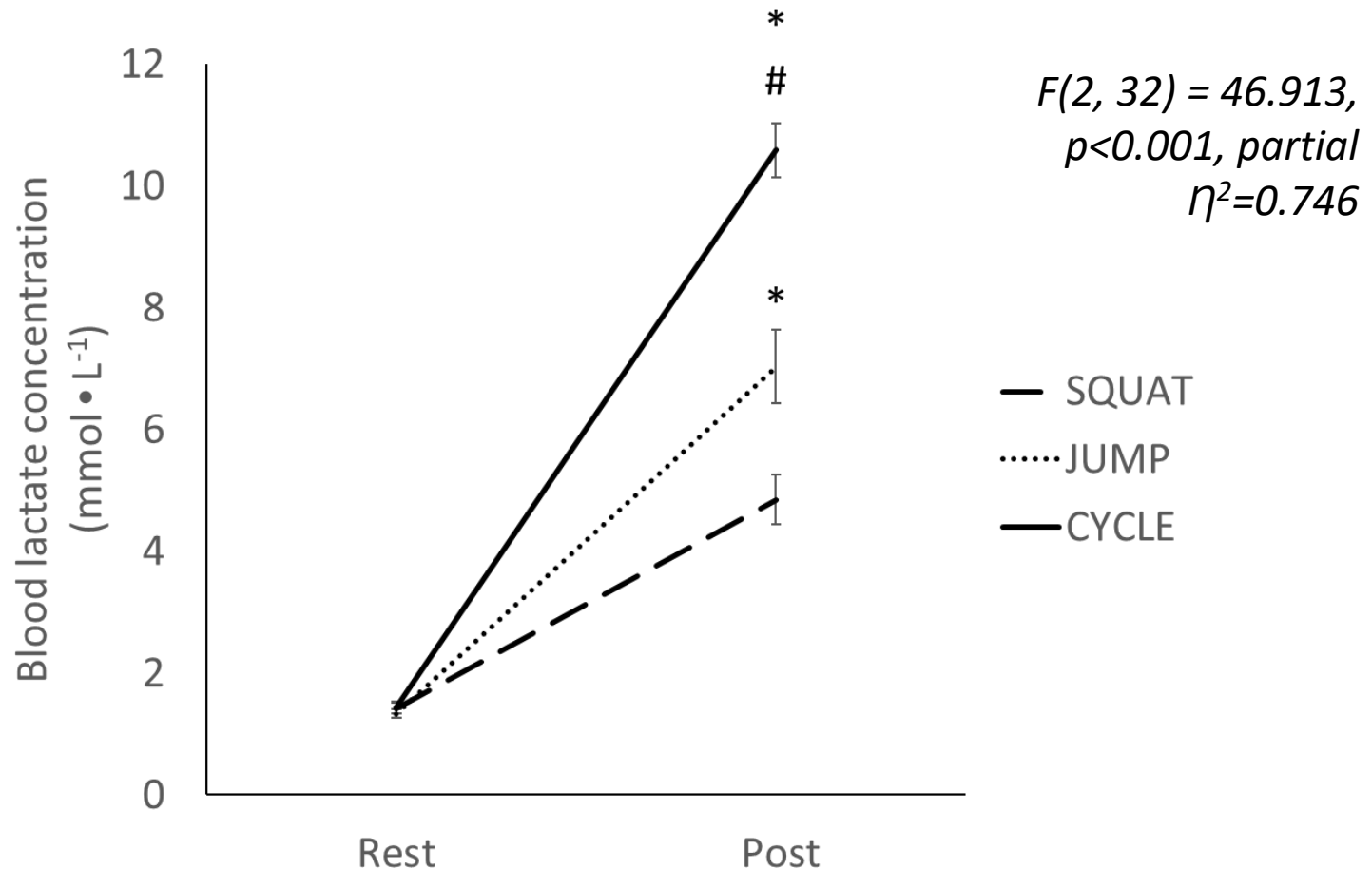
Heart rate (HR)
Blood lactate concentration
Rate of perceived exertion (Borg, 1982)
Feeling Scale (Hardy & Rejeski, 1989)

Physical Activity Enjoyment Scale (Kendzierski & DeCarlo, 1991)

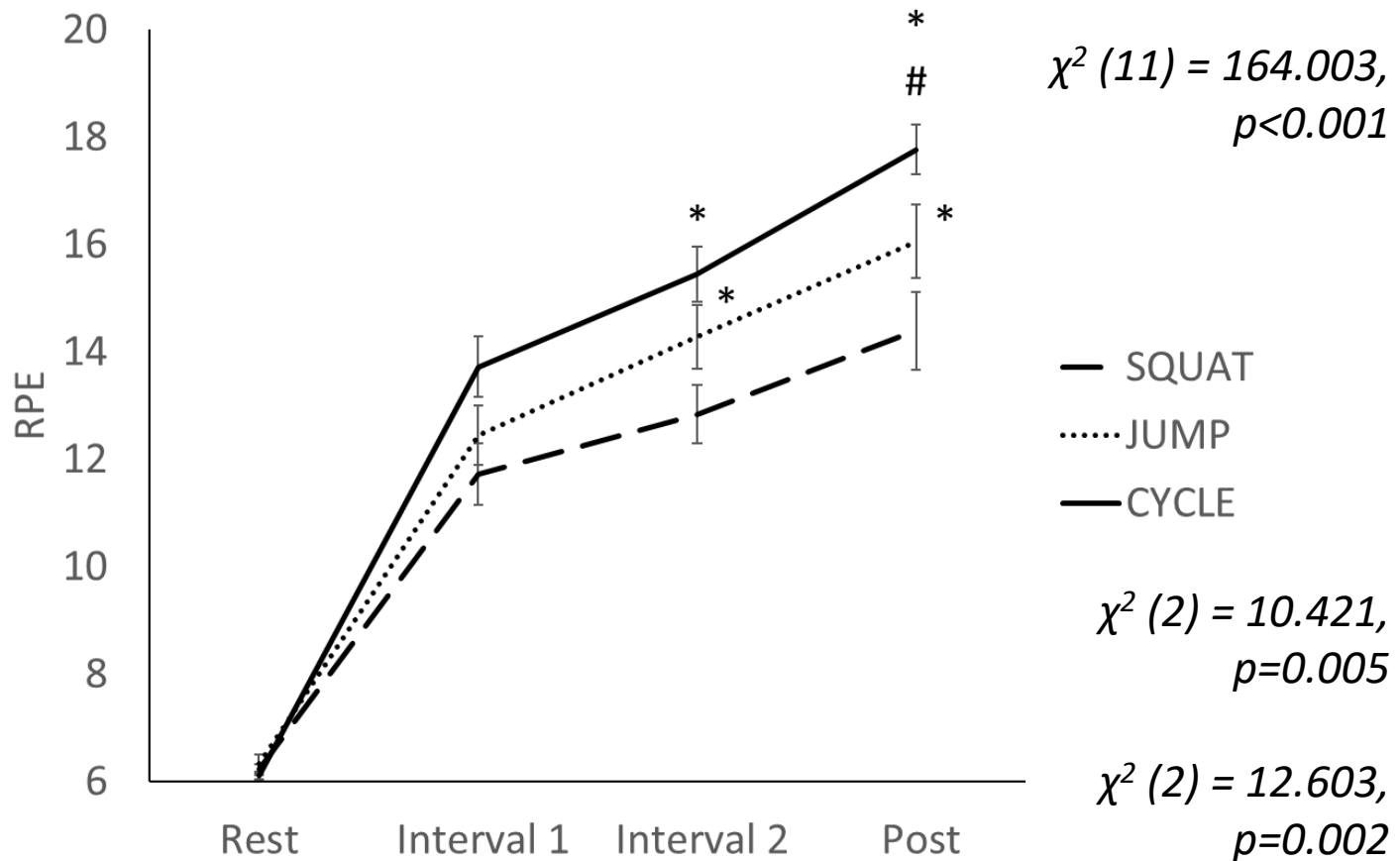
RESULTS: HEART RATE



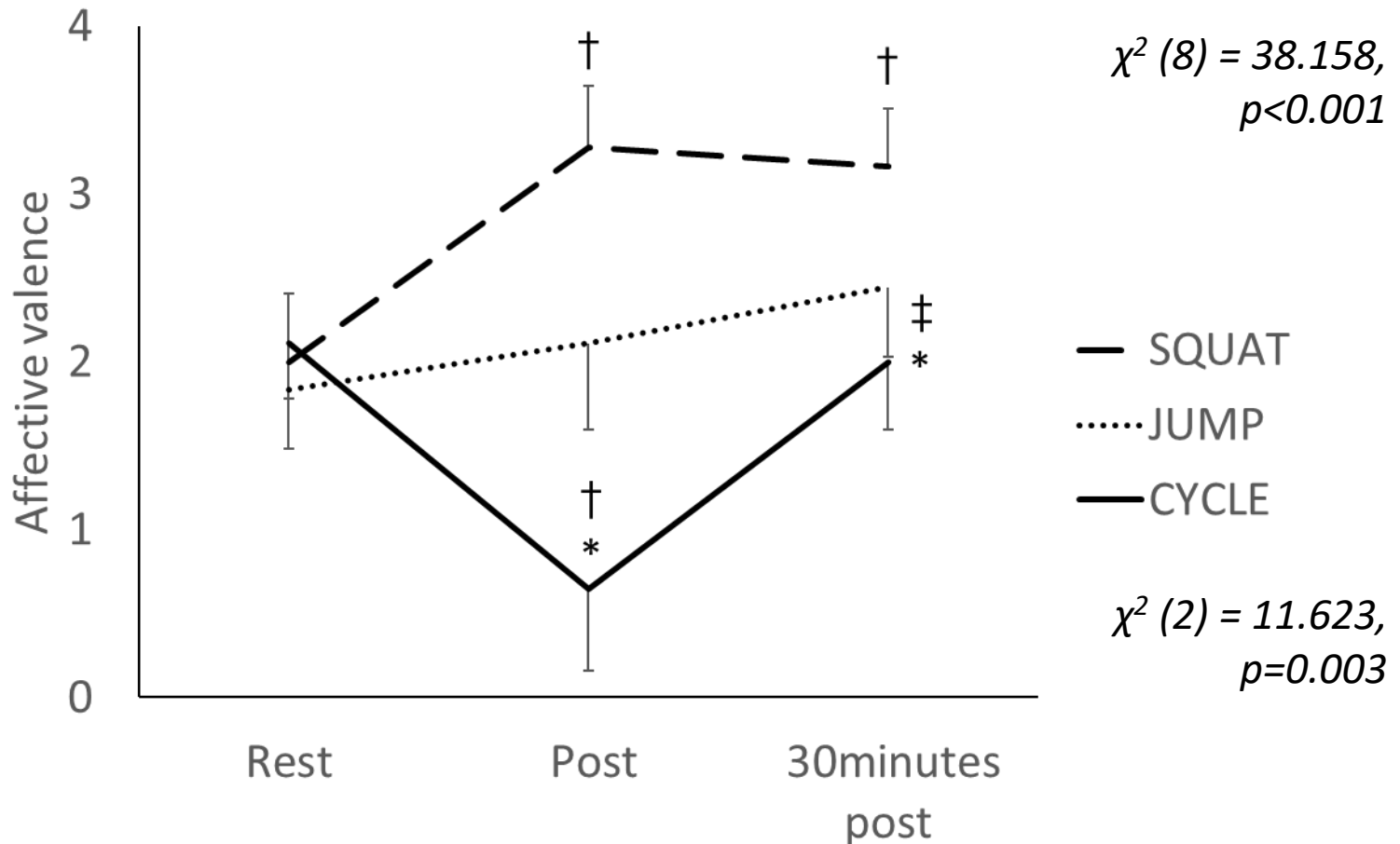
RESULTS: BLOOD LACTATE



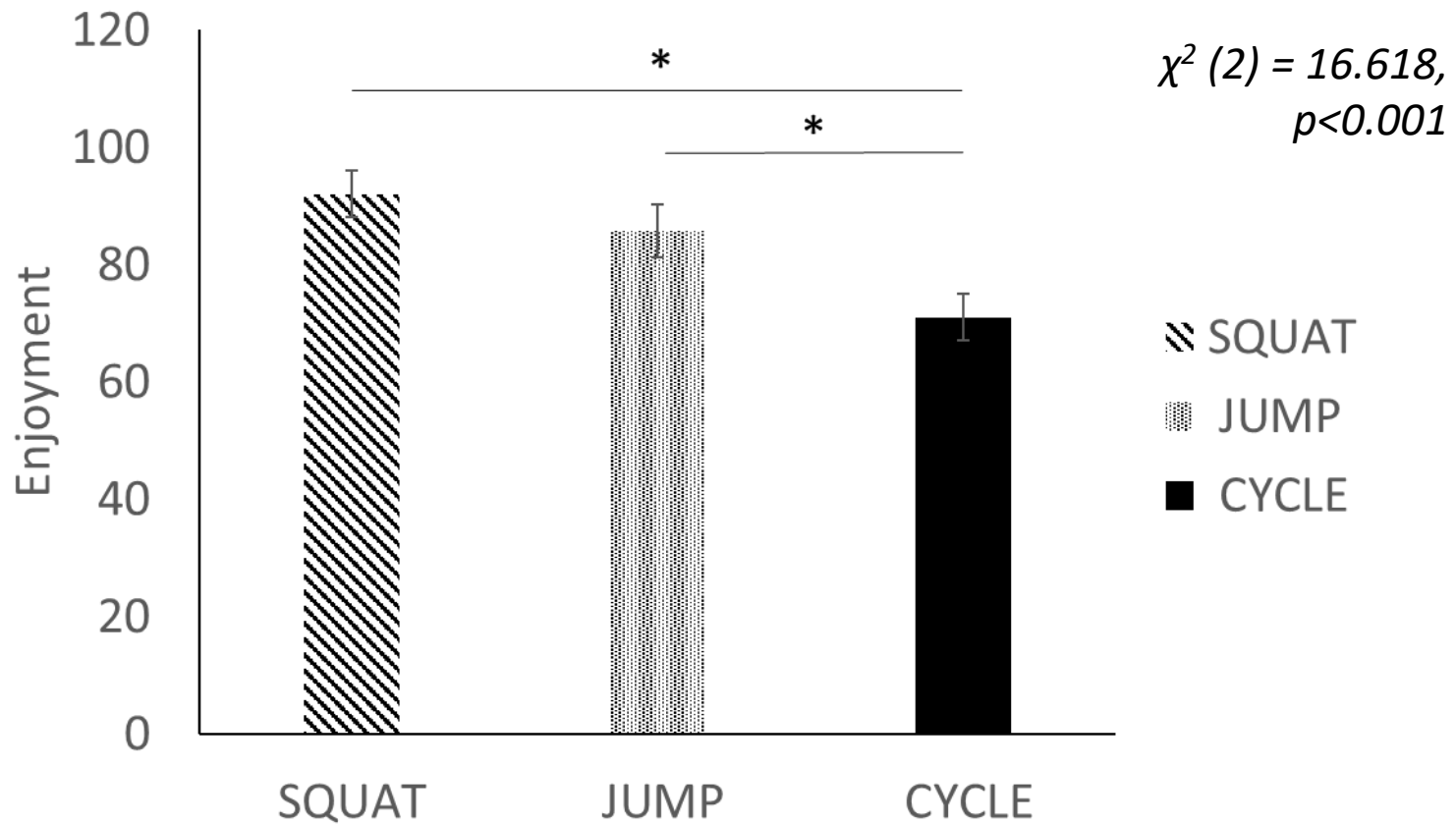
RESULTS: RATE OF PERCEIVED EXERTION



RESULTS: AFFECTIVE VALENCE



RESULTS: ENJOYMENT



CONCLUSIONS

- High-intensity intermittent star jumping saw no differences in heart rate compared with 4x30 seconds of high-intensity intermittent cycling at any time point
- High-intensity intermittent star jumping reached blood lactate concentrations similar to previous literature for typical HIIE protocols
- Immediately post-exercise, affect was lower in high-intensity intermittent cycling compared with the high-intensity intermittent squat protocol as well as a trend for being lower than the star jump protocol
- High-intensity intermittent cycling perceived to be less enjoyable than both the star jumps and squat protocols

IMPLICATIONS

- High-intensity intermittent star jumping can achieve a high-intensity physiological stimulus
- No requirement of particular physical activity apparatus or facilities
- Preferable levels of enjoyment and significantly lower perceived difficulty compared with traditional cycling-based HIIE, despite similar heart rate reached
- Future work to explore effects on long-term health adaptations and markers, including peak oxygen uptake, insulin sensitivity and body composition



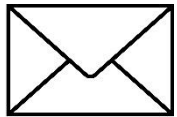
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Questions?



REFERENCES

- Biddle, S. J. H. and Batterham, A. M. (2015) 'High-intensity interval exercise training for public health: a big HIT or shall we HIT it on the head?', *International Journal of Behavioral Nutrition and Physical Activity*, 12(95), pp. 1–8.
- Borg, G. A. (1982) 'Psychophysical bases of perceived exertion', *Medicine & Science in Sports & Exercise*, 14(5), pp. 377–381.
- Cerin, E., Leslie, E., Sugiyama, T. and Owen, N. (2010) 'Perceived barriers to leisure-time physical activity in adults: an ecological perspective', *Journal of Physical Activity & Health*, 7(4), pp. 451–459.
- Gillen, J. B. and Gibala, M. J. (2014) 'Is high-intensity interval training a time-efficient exercise strategy to improve health and fitness?', *Applied Physiology, Nutrition and Metabolism*, 39(April), pp. 409–412.
- Hardy, C. J. and Rejeski, W. J. (1989) 'Not what, but how one feels: The measurement of affect during exercise', *Journal of Sport & Exercise Psychology*, 11(3), pp. 304–317.
- Kendzierski, D. and De Carlo, K. J. (1991) 'Physical Activity Enjoyment Scale: two validation studies', *Journal of Sport & Exercise Psychology*, 13, pp. 50–64.
- Salmon, J., Owen, N., Crawford, D., Bauman, A. and Sallis, J. F. (2003) 'Physical activity and sedentary behavior: A population-based study of barriers, enjoyment, and preference', *Health Psychology*, 22(2), pp. 178–188.
- Trost, S., Brown, W. J., Trost, S. G., Owen, N., Bauman, A. E., Sallis, J. F. and Brown, W. (2002) "'Correlates of Adults' Participation in Physical Activity: Review and Update', *Medicine & Science in Sports & Exercise*, 34(12), pp. 1996–2001.