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

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INTRODUCTION

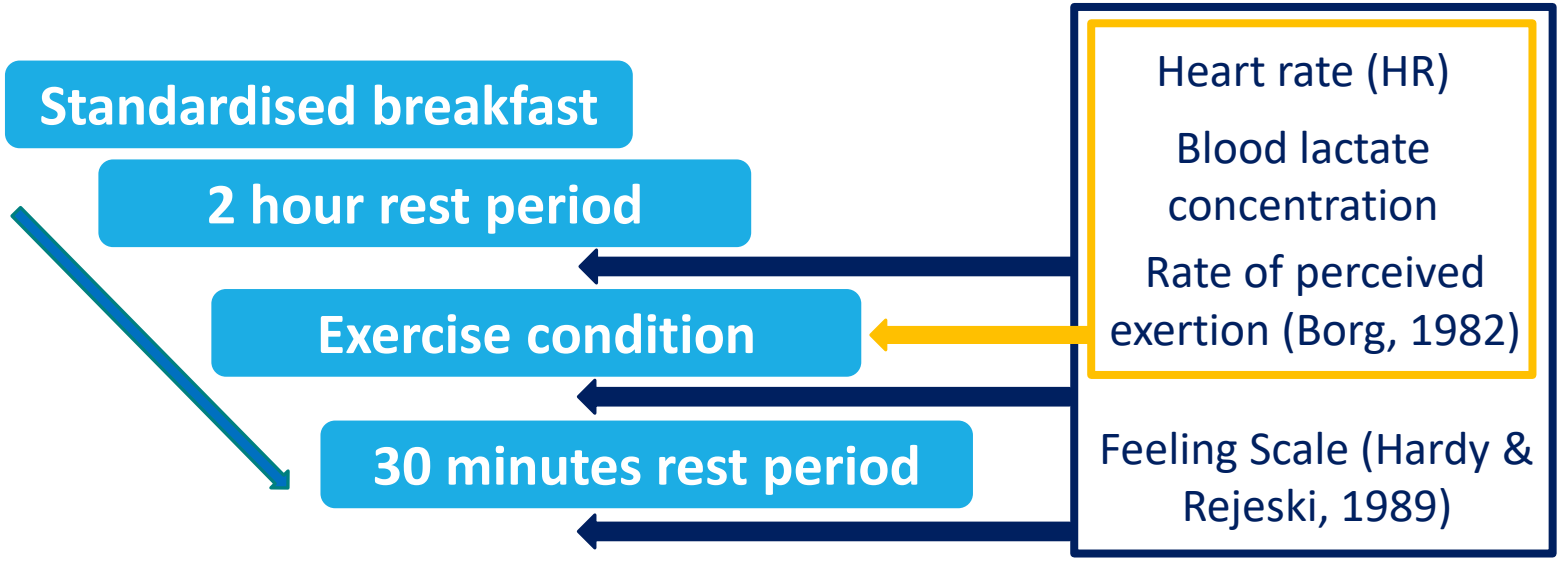
- Perceived lack of time most commonly reported barrier to regular physical activity (Salmon et al., 2003; Cerin et al., 2010)
- High-intensity intermittent exercise (HIIE) is posed as a time-efficient physical activity strategy (Gillen & Gibala, 2014)
- Many HIIE protocols are high-intensity intermittent 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 (Trost 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.

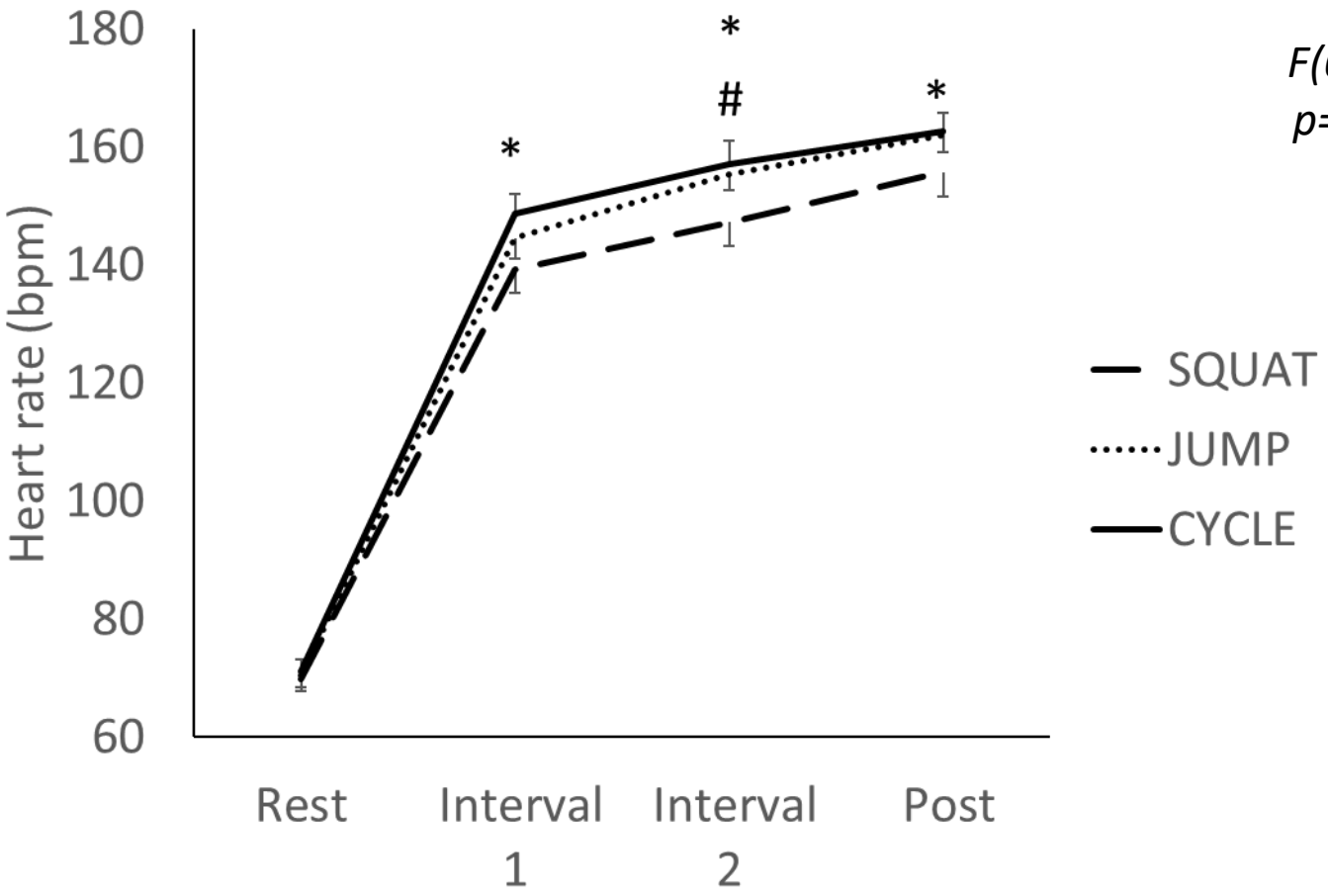
METHODS

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



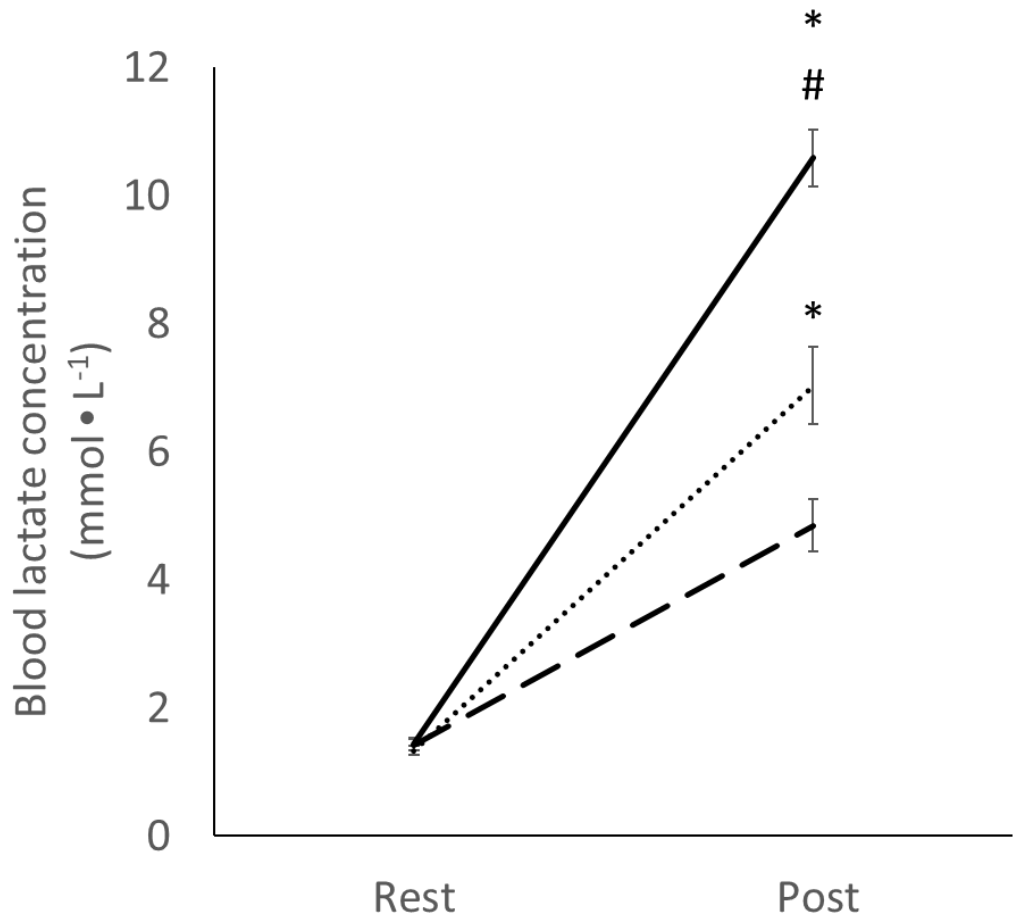
Physical Activity Enjoyment Scale (Kendzierski & DeCarlo, 1991)

RESULTS: HEART RATE



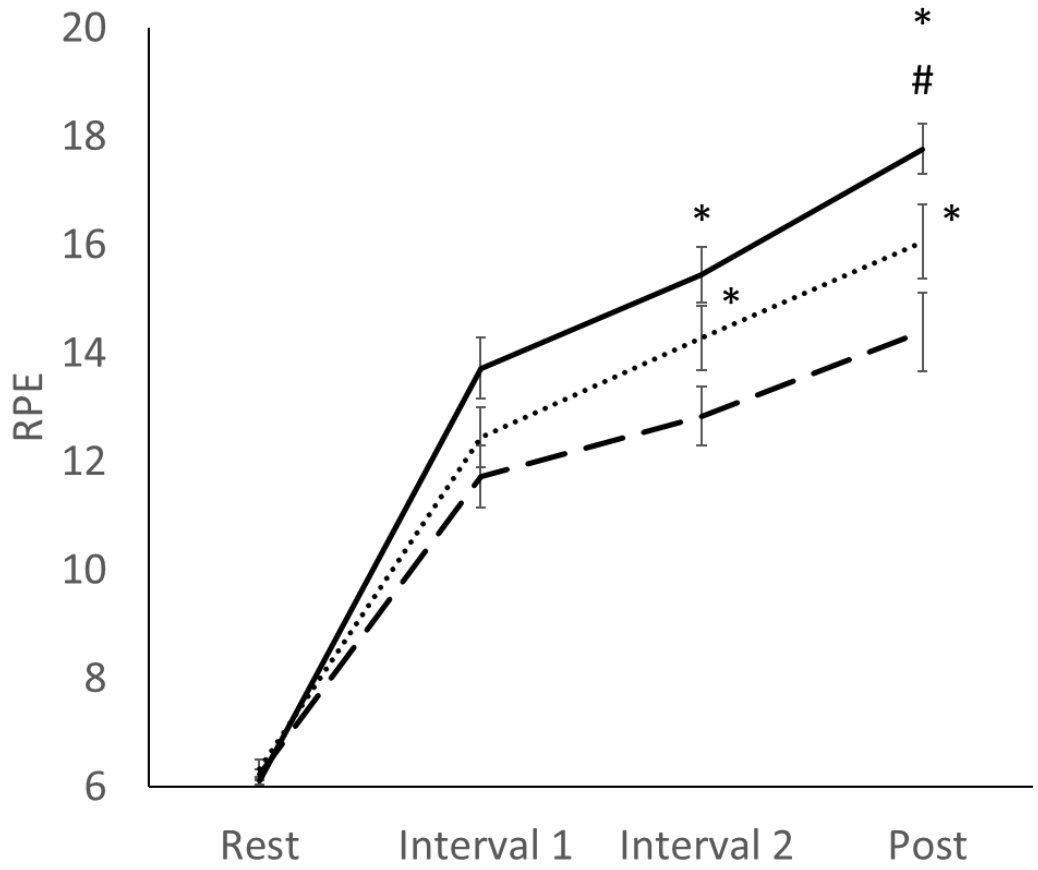
F(6, 90) = 4.037, p=0.001, partial η^2*=0.212*

RESULTS: BLOOD LACTATE



F(2, 32) = 46.913, p<0.001, partial η^2*=0.746*

RESULTS: RATE OF PERCEIVED EXERTION

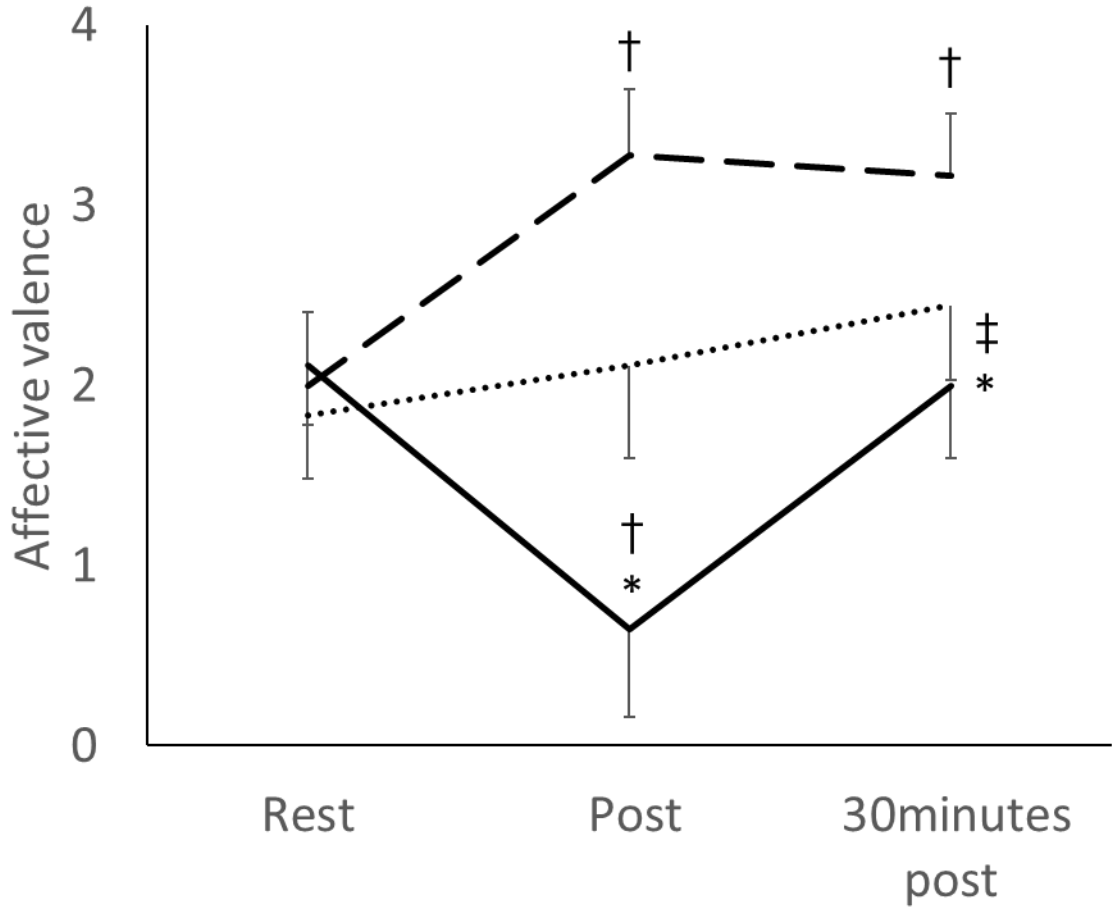


χ^2 (11) = 164.003, p<0.001

χ^2 (2) = 10.421, p=0.005

χ^2 (2) = 12.603, p=0.002

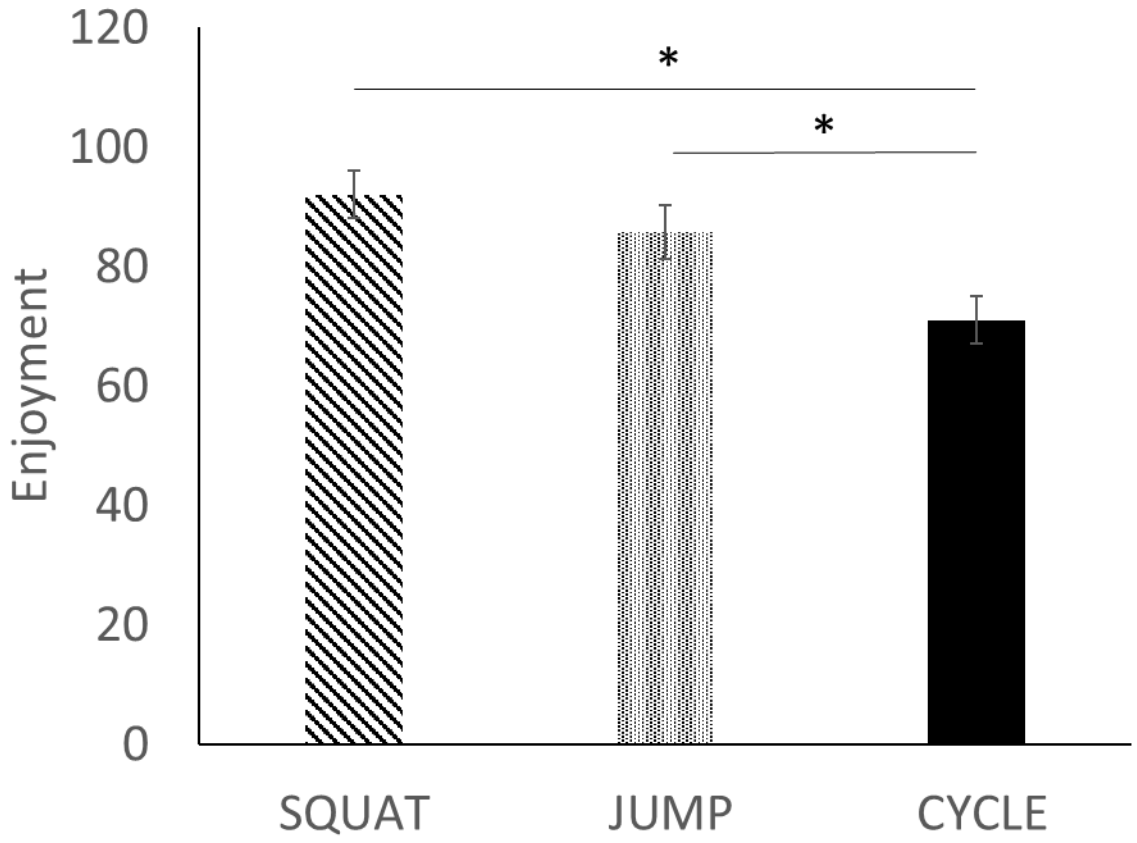
RESULTS: AFFECTIVE VALENCE



χ^2 (8) = 38.158, p<0.001

χ^2 (2) = 11.623, p=0.003

RESULTS: ENJOYMENT



χ^2 (2) = 16.618, $p<0.001$

SQUAT
JUMP
CYCLE

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

THANK YOU FOR LISTENING!

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Questions?

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