

# DIFFERENCES IN STRENGTH BETWEEN MALES AND FEMALE COMPETITIVE ROCK CLIMBERS

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## Purpose

The difference in the level of performance between males and females in rock climbing competitions is striking. For example in the British indoor leading competition series male and female final routes are 8a+ and 7c respectively. There are several possible physical and anthropometric factors which could contribute to this: men are taller, have more muscle mass, have a greater ape index (arm span minus height) and less body fat. Studies by *Watts et al 1993 (J. Sports Sci, 11, 113-117)*, and *Binney et al. 1999 (J Sports Sci, 17(1), 11-12)* have identified % body fat as an important factor in performance for female competitive rock climbers. This study was conducted to investigate whether differences in strength are concomitant with the performance difference when lean body mass is taken into account.

## Methods

12 male and 10 female ( $24.0 \pm 6.0$ ;  $26.5 \pm 5.2$  years, mean age  $\pm$  S.D respectively), elite British competitive rock climbers took part in the study. The isometric strength test battery included, crimp grip strength (measured on climbing-specific apparatus), elbow flexion, elbow extension, pull-up, arm adduction and hip flexion. Anthropometric tests were body dimensions and body composition.

## Results

Percentage body fat between males and females showed significant difference ( $10.4 \pm 4.7$ ;  $22.3 \pm 3.3$  %, ( $p < 0.05$ ) males and females, respectively). Significant differences existed in absolute strength between males and females on all tests except hip flexion,  $p < 0.05$ . Relative to body mass only elbow flexion, pull-up and arm adduction showed significant differences, although crimp grip and elbow extension were greater in males. However, relative to lean body mass there was no significant differences on any of the tests.

## Conclusion

This research has shown that differences in strength relative to body mass between male and female competitive rock climbers are concomitant with gender performance differences in competition. However, no significant difference exists when percentage body fat is taken into account. Although this research has identified a gender link between strength and performance further research is necessary in order to identify whether this differences exists between elite athletes of the same gender. This research supports the relationship between % body fat and performance, which has potential health implication particularly for female climbers.