

# PHYSICAL PREDICTORS OF SUCCESS IN BEGINNING ROCK CLIMBERS

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**INTRODUCTION:** Rock climbing is becoming an increasingly popular sport in many areas, especially since the arrival of indoor climbing surfaces. As in popularity increases there are more novice climbers and climbing students. While studies have been done to establish the relationship between selected physical characteristics and success in elite climbers (Watts, Martin and Durtschi, 1993; Cutts and Bollen, 1993; Grant, Hynes, Whittaker and Aitchison, 1996), no studies have looked at those physical characteristics that relate to success in the novice climber. The purpose of this study is to examine whether the variables of height/weight, grip strength, upper body strength and muscular endurance, leg strength, leg span, or maximum thigh abduction angle can predict success in novice rock climbing students.

**METHODS:** Subjects for this study were 66 (28 female, 38 male) university students enrolled in rock climbing classes. Prior to the first day of instruction subjects were tested on the physical factors. Age and gender were recorded, and weight and height measured. Grip strength in the dominant hand was measured as the average of three trials using a hand held dynamometer. Leg strength was measured using one maximum effort lift against a leg dynamometer. Upper body strength and muscular endurance were measured using pull ups from a stationary hang with the forearm in pronation. Leg span was measured with the subject in a supine lying position. The subject was asked to spread the legs as far apart as possible and measurement taken between the two points of heel contact. At the same time, thigh angle was measured with a goniometer placed on the trunk so that the extended arms of the goniometer bisected both the hip joint and the patella, producing a measure of relative thigh separation.

Climbing success was measured at the end of the eight-week climbing class. The climbing instructor established a series of climbing routes rated in difficulty from 1 to 7. Each subject started on the most difficult route they felt they could climb. If the subject failed to reach the top in a single climb, they took a rest period, then climbed the next easiest route. If they succeeded in the initial climb, the subject rested, then climbed the next most difficult route. The final success score was the rating of most difficult route the subject was able to climb in a single effort.

The physical test scores were used as independent variables in a regression analysis, which was used to determine the extent to which each of the physical variables predicted success in climbing. Gender differences were also examined.

**RESULTS AND DISCUSSION:** Climbing success was correlated with gender, with males being more successful. While no physical factors were found to predict climbing success in females, male success was predicted by measures of upper body strength and thigh angle.

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