

# Open hand vs. half-crimp: Do climbers assume differences in their own maximal finger strength that do not exist?

**Introduction** Many climbers believe that they are stronger in the crimp position than the open hand position, but the crimp is linked to higher pulley forces, increasing the risk of finger injuries. Hence, the aim of this study was to determine how accurate climbers from different skill levels can assess their finger flexor strength in the half-crimp and open hand position.

**Methods** Finger strength data from 38 intermediate and 36 advanced climbers, along with self-assessment questionnaires, were collected at the Climbing World Championships in Bern. Additional data from 11 elite athletes was gathered in the lab. An instrumented campus board with a rung depth of 23mm was used for the force measurements.

**Results** Within each group, slightly higher maximal finger forces were observed for the open hand position compared to the half-crimp (see Tab. 1). Advanced climbers overestimated their strength in half-crimp position for the non-dominant hand by a mean of 9% (see Fig. 1). No consistently significant differences in the self-assessment were observed between the groups.

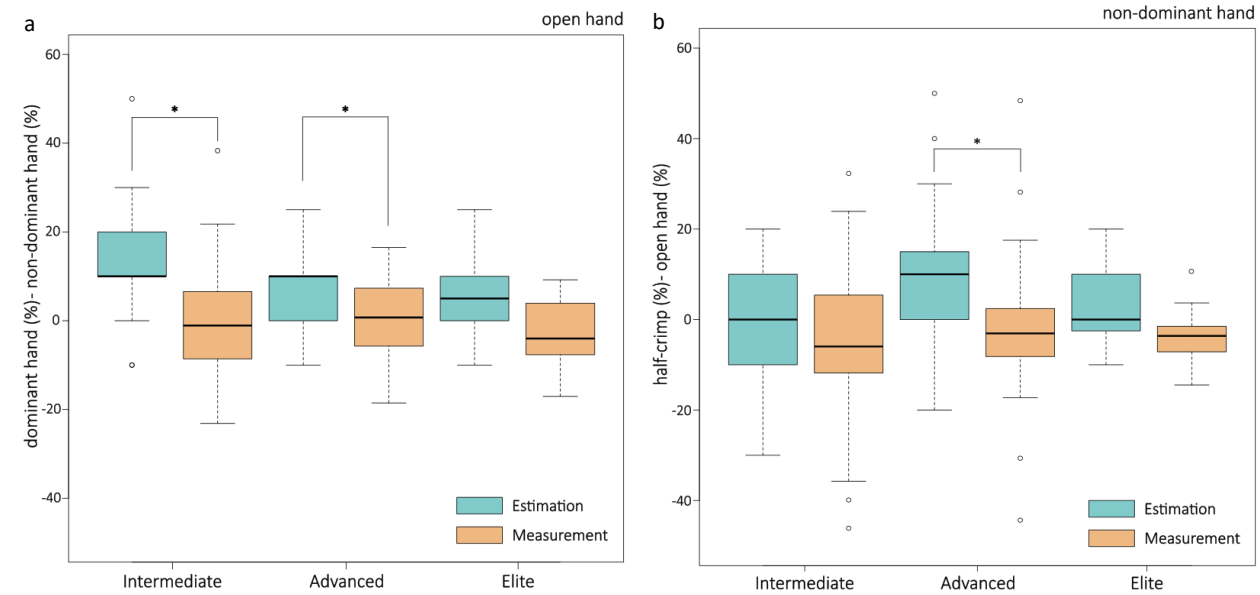


Fig. 1 Comparison of self-estimated and measured force values for (a) the difference between dominant and non-dominant hand in open finger position and (b) the difference between open and half-crimp for the non-dominant hand, climbing level according to IRCRA scale

\* indicates a significant difference between estimated and measured force values

Tab. 1 Mean measured force values (SD) for the four measured conditions in relation to bodyweight (%)

		Dominant hand, open	Non-dominant hand, open	Dominant hand, half-crimp	Non-dominant hand, half-crimp
Intermediate	Male (n=45)	64.9 (9.4)	64.6 (8.7)	63.2 (12.5)	61.4 (13.9)
	Female (n=13)	47.9 (8.6)	49.1 (9.2)	47.1 (9.2)	45.9 (10.5)
Advanced	Male (n=26)	75.4 (15.0)	73.3 (15.5)	74.9 (14.0)	72.2 (15.2)
	Female (n=23)	63.0 (8.0)	61.8 (6.0)	61.7 (8.8)	59.5 (9.0)
Elite	Male (n=14)	94.6 (13.1)	94.2 (16.4)	94.0 (13.6)	92.3 (17.1)
	Female (n=3)	55.8 (1.5)	61.5 (2.6)	60.8 (4.1)	57.2 (3.3)

**Discussion** For hold depths of 23mm and larger, we recommend adopting an open hand position to prevent finger injuries as the half-crimp offers no force advantage. Based on our findings, we cannot generally conclude that higher skilled climbers assess their strength capacities more accurately than less skilled climbers. Understanding how climbers perceive their finger strength could help in developing injury prevention strategies.