

## **A comparison of the reverse and power punches in oriental martial arts.**

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In this study, we compared mechanical factors in the reverse and three-inch power punches. Twelve expert male martial artists stood on a force plate, and executed reverse and power punches against a padded target fixed to a wall-mounted force plate. The force plates measured horizontal forces, and subsequently impulses and body centre of mass velocity changes. The motions of four markers attached to the arm were also collected, and were used to compute the horizontal velocities of the knuckle and of the arm centre of mass. The power punch produced smaller velocities immediately before impact than the reverse punch for the whole-body centre of mass (0.14 vs. 0.31 m . s(-1)), for the arm centre of mass (2.86 vs. 4.68 m . s(-1)), and for the knuckle (4.09 vs. 6.43 m . s(-1)). The peak force exerted by the fist was much smaller in the power punch than in the reverse punch (790 vs. 1450 N). However, the linear impulse exerted by the fist during the first 0.20 s of contact was slightly larger in the power punch than in the reverse punch (43.2 vs. 37.7 N . s). The results indicate that the power punch is less potent than the reverse punch, but slightly more effective for throwing the opponent off balance.