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## A comparative study of speed expressed by the number of throws between heavier and lighter categories in judo

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### Introduction

Analysis of several high-level judo competitions recognized that lightweight categories tend to begin attacks more frequently than heavier categories. Surprisingly, lighter athletes tended to use more arm techniques (*Seoi-nage*), which was in contrast to heavier athletes who employed more leg techniques (*Uchi-mata*, *O-soto-gari*) and performed pins more successfully <sup>1</sup>. In this study, we examined the relationship between weight categories and throwing speed.

### Methods and subjects

Sixteen male judoists participated in the study, eight judoists from under 73 kg categories, considered here as the lighter category and eight judoists from more than 73 kg categories, considered as the heavier category.

A force/velocity test was used to determine the anaerobic power, strength, and pedal speed for each subject. In addition three trials of Nage-komi exercise, each comprised of a sets of Osoto-gari (15s), Uchi-mata (15s) and Seoi-nage (15s) throws were performed by each subject to

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ascertain throwing speed. Throws within the sets were intersected by one period of 3 minute passive rest while the trials were separated by one period of 10 minute passive rest. Heart rate and the greatest number of throws within each set were measured for three trials.

We used a one-way analysis of variance (ANOVA) to compare the number of throws between the two weight categories and a "Student" test when the difference was significant. A correlation was used to examine the link between the different parameters.

**Results:** The force/velocity test did not show a significant difference in pedal speed between the two categories. However, there was a significant difference between the two categories when throwing speed was measured by the number of throws ( $p<0.05$ ) executed during the Seoi-nage ( $p<0.01$ ) and Uchi-mata ( $p<0.05$ ) techniques. But there was no significant difference between the two categories in Osoto-gari technique.

**Conclusion:** The throwing speed of judoists represented by number of throws appears to be significantly different between the two categories. The lighter category has more speed than the heavier category using arm technique (Seoi-nage), while the heavier category has more speed using leg technique with half turn of the attacker's body (Uchi-mata). As a result, throwing speed is related to the type of technique used and not weight category.

**Keywords:** light and heavy categories, arm techniques, leg techniques

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