

Overcome strength-training plateau with accentuated eccentric loading

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Dr. Simon Walker does accentuated eccentric loading using a leg press. Credit: Dr. Simon Walker

Hitting a plateau in strength training? The answer to overcoming it might lie in accentuated eccentric loading (AEL).

Many experienced strength trainers try to overcome a plateau by trying to adapt their strength programme, however this is sometimes ineffective. In just five weeks accentuated eccentric loading training considerably improved results for experienced strength-trainers, a study recently published in *Frontiers in Physiology* found.

This method is based on the principle of repetitive muscle contractions applying a greater external load during the muscle's lengthening, the eccentric phase of the lift, than in the shortening, the concentric phase. The eccentric phase, for example, is the action of lowering the dumbbell

back down from the lift during a biceps curl, as long as the dumbbell is lowered slowly rather than letting it drop.

This is different to the very popular isoinertial training where the same weight is used in both stages of the movement.

"It is important to train using actions that are highly specific to normal actions. I have always been interested in trying to optimize training because lots of people train hard, but I want those people to train smart allowing them to get the most out of their efforts;" explained Dr. Simon Walker from the Department of Biology of Physical Activity at University of Jyväskylä, Finland.

He added: "It was clear that the force production capacity during eccentric actions was not being utilized during traditional isoinertial training."

To determine the effects of accentuated eccentric loading the scientists conducted a ten week experiment applied to 28 experienced male strength-trainers separated into three groups: two groups (one using AEL and the other isoinertial training) were exposed to supervision, motivation, greater loading intensities, immediate post-training protein consumption and assistance at concentric failure, meanwhile the third group continued their normal unsupervised training program.

The results for the group using the accentuated eccentric load training were remarkable after the fifth week observing an increase of force production, work capacity, muscle activation and resistance compared to the other groups. However, both AEL and isoinertial methods were equally effective to increase the cross-sectional area of the quadriceps muscle, in subjects accustomed to resistance training.

"This information can modify people's training methods and perhaps highlight contemporary

training methods that can be included and periodized into people's training regimes, this can range from patient groups to the elderly right through to athletes," said Dr. Walker.

Evidently, the benefits of accentuated eccentric loading in already-trained individuals may take some time to manifest and, therefore, even several sessions of training may be insufficient to produce meaningful improvements.

"This is no magic pill that will suddenly create huge differences over systematic hard work. smart periodization, and nutrition; but it can give a boost or kick start to overcoming a plateau in strength and muscle mass development;" he continued.

However, it would be interesting to examine if adapting to even longer training periods of accentuated eccentric loading in the future will produce continued improvements or if otherwise the continuous high intensity may lead to over-reaching.

"There are lots of unresolved issues still, such as how AEL may affect recovery, training frequency, and also whether [training](#) intensity and volume should be adjusted to better suit the individual. Nevertheless, this study alone gives good evidence that athletes can work on a problematic area, for example to develop strength and muscle mass, by using this method when stagnation has occurred;" added Dr. Walker.

More information: Simon Walker et al, Greater Strength Gains after Training with Accentuated Eccentric than Traditional Isoinertial Loads in Already Strength-Trained Men, *Frontiers in Physiology* (2016). DOI: [10.3389/fphys.2016.00149](https://doi.org/10.3389/fphys.2016.00149)

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