

**Commentary on: “Viewpoint: Distinct modalities of eccentric exercise: different recipes, not the same dish”**

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We read with interest the recent viewpoint on the different eccentric exercise modalities (4) and we commend the Authors for having raised this interesting topic. Since the eccentric-exercise family is variegated, characterizing each modality helps identifying their specific intrinsic stimuli. However, a between-modality comparison is not an easy matter.

Exercise volume is a key-factor in resistance training. A recent meta-analysis showed comparable exercise volumes led to similar strength gains (5). When performing an isoweight eccentric exercise, the volume can be manipulated *a priori*, given the total number of repetitions and for each repetition the range of motion, time under tension and intensity (i.e., the external load) (2). When performing an isokinetic eccentric exercise, the intensity depends on the subject's ability to gradually or maximally perform each repetition. To possibly match the eccentric isoweight vs isokinetic exercise intensity, we previously calculated the maximal eccentric:concentric isokinetic ratio and then transferred such a ratio as percentage of the maximal concentric isoweight load (i.e., %1-RM) (2). It resulted comparable isoweight vs isokinetic training intensity and volume led to overall similar muscle strength and architecture changes (2, 3).

To further entangle this picture, the eccentric phase of isoinertial exercise is preceded by a maximal explosive-concentric phase (1). Thus, isoinertial cannot be considered as a purely eccentric exercise because of the effects of the eccentric or concentric phase, or the combination of both.

Therefore, encouraging new studies to compare isoweight vs isokinetic vs isoinertial eccentric training, we recommend a thorough exercise volume calculation for appropriate matching.

## REFERENCES

1. **Berg HE, Tesch A.** A gravity-independent ergometer to be used for resistance training in space. [Online]. *Aviat Space Environ Med* 65: 752–6, 1994.
2. **Coratella G, Milanese C, Schena F.** Unilateral eccentric resistance training: a direct comparison between isokinetic and dynamic constant external resistance modalities. *Eur J Sport Sci* 15: 720–6, 2015.

3. **Coratella G, Milanese C, Schena F.** Cross-education effect after unilateral eccentric-only isokinetic vs dynamic constant external resistance training. *Sport Sci Health* 11: 329–335, 2015.
4. **Franchi M V, Maffiuletti NA.** Distinct modalities of eccentric exercise : different recipes , not the same dish. *J. Appl. Physiol.* .
5. **Grgic J, Schoenfeld BJ, Davies TB, Lazinec B, Krieger JW, Pedisic Z.** Effect of Resistance Training Frequency on Gains in Muscular Strength: A Systematic Review and Meta-Analysis. *Sport Med* 48: 1207–1220, 2018.