

Editorial

What is adaptation energy?

Jeremy P. Loenneke

The General Adaptation Syndrome was introduced and popularized by Hans Selye in the early 1900s.¹ This syndrome starts with the alarm phase, progresses to the resistance phase, and ends with the exhaustion phase. Adaptation energy is a key concept of the General Adaptation Syndrome and it is hypothesized that the depletion of this energy explains the reappearance of symptoms of the alarm reaction within the exhaustion phase (ultimately leading to death of the organism). Selye suggested that this “energy” could be depleted but not regained and that any stress leads to an irreversible loss of the ability to adapt to future stressors.

In the previous issue of the Journal of Trainology, Vasenina et al.² examined the experimental evidence behind adaptation energy and the importance of understanding this concept when discussing the General Adaptation Syndrome. It is common in the Exercise Science literature to try and apply the General Adaptation Syndrome as a framework for understanding the adaptations to exercise.^{3,4} However, Vasenina et al.² note that the key concept of adaptation energy or how this energy might contribute during and following exercise is rarely discussed in the strength and conditioning literature. In Table 1 of their article², readers will find a breakdown of how each phase is described in the strength and conditioning literature and how that corresponds to the same phase according to Hans Selye’s experimental data. Given the discrepancy between how the General Adaptation Syndrome has been applied and what the experimental evidence actually suggests, it would appear that the field of Exercise Science copied the General Adaptation Syndrome in name only. The authors note that although Hans Selye was not always consistent in defining what adaptation energy specifically was, he was clear that the General Adaptation Syndrome is distinct from what is observed following exercise training. For example, he noted that the General Adaptation Syndrome “is distinct from the specific adaptive reactions, such as the development of the musculature following prolonged physical exercise...”⁵

The authors close by reviewing other possibilities for the application of adaptation energy.² They indicate that there could be some relevance with certain theories of aging. In other words, perhaps part of aging is explained due to the depletion of a finite amount of adaptation energy. The authors suggest that this may have some parallels to the wear and tear theory of aging. Vasenina et al.² also report that the concept of adaptation energy has shown up previously in other areas such as occupational therapy and certain schools of medicine. Although the authors note the appearance of adaptation energy in the literature, the case made for its relevance is far from compelling. Ultimately, it is not known whether or not adaptation energy exists and what if anything this energy could explain if it was to ever be quantified. The authors of “Adaptation energy: Experimental evidence and applications in exercise science” should be commended on an excellent and thoughtful addition to the literature.

REFERENCES

1. Selye H. Experimental evidence supporting the conception of “adaptation energy”. *Am J Physiol* 1938;123:758-765.
2. Vasenina E, Kataoka R, Buckner SL. Adaptation energy: Experimental evidence and applications in exercise science. *J Trainol* 2021;9:66-70.
3. Stone MH, O’Bryant H, Garhammer J. A hypothetical model for strength training. *J Sports Med Phys Fitness*. 1981;21:342-351.
4. Cunanán AJ, DeWeese BH, Wagle JP et al. The General Adaptation Syndrome: A Foundation for the Concept of Periodization. *Sports Med* 2018;48:787-797.
5. Selye H. The general adaptation syndrome and the diseases of adaptation. *J Clin Endocrinol Metab* 1946;6:117-230.

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