# Effect sizes for paired data should use the change score variability rather than the pre-test variability.

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# Abstract

### Full Citation

Dankel, SJ and Loenneke, JP. Effect sizes for paired data should use the change score variability rather than the pre-test variability. J Strength Cond Res 35(6): 1773–1778, 2021—

### What is effect size

- ▶ Variable that provides an overall measure for magnitude of change (Cite)
- ▶ Differs from a T-statistic because sample size is not included
- ▶ Used in various baseline-post-treatment comparison
    - ▶ Specifically, they are looking at this comparison from the lens of meta-analyses for exercise science and sports medicine

# Main Issue

In effect size calculations for paired data, the authors argue that people tend to use the wrong kind of variability. What are the two kinds of variability that they are referring to?

# Variability of the Study Sample

- Any measure of difference between subjects in a given treatment group
- Represented by the Baseline and Post-treatment Standard Deviation.
- Dankel(Cite) and his team claim that the use of this type of variability in paired-sample studies is useless as it has nothing to do with the treatment itself

# Variability of the Intervention

- ▶ Any measure of difference between baseline and post-treatment measure
- ▶ Represented in ths case by the Standard Deviation of Change Scores (I will elaborate on this later)
- ▶ Dankel and his team prefer this method of assessing variability

# Authors

## Dr. Scott Dankel

- ▶ Professor at Rowan University, a public research university in New Jersey
- ▶ Attended the University of Mississippi to pursue a Masters and PhD in Exercise Science
- ▶ Research Interests include acute and chronic adaptations to blood flow restricted exercise (Cite)

# Authors (continued...)

### Jeremy Paul Loenneke

- ▶ Professor at The University of Mississippi
- ▶ Attended Southeast Missouri State for his Bachelors and Masters in Nutrition and Exercise Science
- ▶ Eventually got his PhD in Exercise Physiology at the University of Oklahoma
- ▶ Research Discipline is in Skeletal Muscle Plasticity (Cite)

### General Comments

- ▶ Regarding the disciplines of the authors, this paper was published in The Journal of Strength and Conditioning Research
- ▶ Good example of the use of statistics as an interdisciplinary tool

# Introduction

## Specific Effect Size Measures

- ▶ Cohen's d (Cite)
- ▶ Hedge's g (Cite)
- ▶ Glass delta (Cite)
- ▶ Each use some combination of baseline standard deviation and post-treatment standard deviation.
- ▶ Measures of variability of the study sample ### Paired Data vs. Independent Data
- ▶ Brief overview of each

# Methods

Figure 1

Figure 2

# Results

# Discussion

# References