**Effect Size and Significance**

The Effect Size (ES) in a study is a relative number expressing the strength of the relationship between statistical populations (sample and control) and the interventions to which they were exposed. This measure of association is complex. The researchers and the reviewers must ensure that the study design has internal validity, free of bias and accounts for confounding variables and random error. ES is expressed as small, moderate or large using numbers between -1 and +1. Because the ES is a relative number, it complements other statistical measures. There are also several measures of ES dependent upon the type of study. There are three common approaches to determining the effect size; 1) statistical significance, 2) practical significance using the raw mean differences of experimental groups, and 3) relative size of the effects based on standardized estimates.

Reference: [Effect Size Guidelines - Effect Size Substantive Interpretation](#)

Significance in statistics represents a causal relationship, rather than chance occurrence (McGraw-Hill, 2002). A “statistically significant” result is one that would occur by chance less than a certain percent of the time. Usually significance level is set at .05 (95 percent likelihood not due to chance) but other levels such as .01 are commonly used (99 percent likelihood not due to chance). It has been argued that significance level should always be accompanied by effect-size statistics to understand the size and importance of the difference (Wikipedia, 2011). Historically, Lehrer (2010) explained that .05, as a cutoff, was a somewhat arbitrary decision made by English mathematician Fisher, in 1922, as it made pencil and slide rule calculations easier. Often the .05 level is chosen because it is conventional (Wikipedia 2011).

**References**

Lehrer, J (2010). The Truth Wears Off: Is there something wrong with the scientific method? Retrieved:
