

Equivalence testing

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Aims and Scope

Equivalence (also called similarity or parity) tests are becoming increasingly popular in many application areas, among which sensory sciences. They can and should be applied whenever the aim of the study is not to show differences, but to conclude similarity.

There has been quite some debate about pros and cons of different approaches, and this debate has reached the sensory and sensometrics community in recent years (e.g. a mini-symposium at the 2008 Sensometrics meeting and the respective special issue of FQAP, and several letters to the editor in FQAP 19 (3)). Parts of the sometimes heated debate are, in my opinion, due to mutual misunderstandings, and to different objectives and hence selection criteria for an “optimal” test.

The workshop intends to give an introduction into equivalence tests, starting with some general considerations on the statistical testing of hypotheses. I will subsequently give an overview over the most common approaches, some of which are shown to be inappropriate (e.g. the power approach). Some valid and relatively simple methods will be introduced and their correspondence to confidence intervals clarified, while mathematical details of any advanced tests will be skipped. Instead, I will discuss some pros and cons of different approaches, including the recent proposal of Ennis & Ennis using symmetric open intervals.

A main objective of the workshop is to educate the participants to identify a problem which needs to be addressed by an equivalence approach rather than a difference test. Subsequently, instead of introducing one approach only and rejecting the others, I will discuss the pros and cons and the implications of the tests. The participants will therefore learn to make an appropriate choice for future problems; they should learn that none of the tests is generally superior to all others (and, more importantly that the differences are often enough negligible).

It is assumed that the participants are familiar with t-tests, binomial tests and alike; the ideas of this workshop will be presented without sophisticated methods and in an interactive manner; they will be illustrated by examples from sensory applications.

Duration: 0.5 day

Audience: Sensometricians / statisticians and sensory scientists who want to learn about equivalence tests, illustrated by applications from sensory sciences

Background: Basic understanding of statistics is advantageous.

Software: No software exercises planned.