ANDI - Advanced Neuropsychological Diagnostics Infrastructure

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What is ANDI?

Advanced Neuropsychological Diagnostics Infrastructure (ANDI)

Web-based infrastructure that uses multivariate statistical techniques and a large normative database to solve diagnostic and outcome assessment problems in clinic and research.

- Users can upload test data to the ANDI website.
- Patient’s test scores are compared to the ANDI normative database.
- ANDI returns a detailed, multivariate analysis of the profile of test scores.

Traditional normative comparisons

Traditional normative comparisons in neuropsychological practice:

- Neuropsychological tests are stand-alone instruments.
- A neuropsychological examination requires many tests.
- Each test result is compared to its norm tables
- In statistical terms: multiple univariate comparisons.

Problems with traditional normative comparisons:

- Multiple comparisons increase type I error (false positives).
- Interpreting multiple test results is difficult. When is a patient abnormal?
- Correlations between tests are often unknown.

Patient A

Test 1

Norm table

Test 2

Norm table

Test 3

Norm table

Test 4

Norm table

Multivariate normative comparison

Advantages of multivariate normative comparison (MNC):

- Multivariate normative comparison (MNC) compares all test scores simultaneously.
- One comparison on multiple dimensions, thus small type I error.
- Yet, MNC is more sensitive because it takes correlations between tests into account.

Patient

Test

Test

Test

Test

Norm

Comparing a patient to the norm

- These figures show MNC of a patient on the Auditory Verbal Learning Test (total learning over 5 trials and delayed recall), animal fluency and letter fluency.
- These data come from the ANDI database and have been normalized, standardized and corrected for demographic variables.

ANDI database

Thirty research groups from The Netherlands and Belgium donated to ANDI

- 90 datasets containing data of
- 150 neuropsychological tests from
- +/- 25,500 healthy participants

See: www.andi.nl

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Traditional normative comparisons

• These figures show MNC of a patient on the Auditory Verbal Learning Test (total learning over 5 trials and delayed recall), animal fluency and letter fluency.

• These data come from the ANDI database and have been normalized, standardized and corrected for demographic variables.

MNC (4, 2139) = 4.36 p = 0.002

* Only two of six bivariate plots are depicted here.

These plots show that none of the scores is abnormal by univariate comparison. However, MNC shows that this patient has a deviating cognitive profile with a specific weakness in memory.