

Manual NormScore

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Objective of the Application

The application scores tests that are made up of several subtests. The scores on the subtests are ability estimates issued from the program Lexter. The ability estimates are combined into an overall ability estimate by applying a linear function with weights. The application categorizes the ability estimates using cut-off points (the norms) and produces percentages of frequency distributions of the category entries. Further, the program produces output that can be used in secondary applications, such as Excel, for further scoring.

Two set of norms can be applied. For the first one, the norms are derived directly from an IRT equating procedure that places several tests on a common IRT scale. The outcome for an individual student will be called the test-advice.

The second procedure equates the category-bounds to an external criterion, references here as the school-advice. Besides the test-advice and the school-advice of the target test, also the test-advice and the school-advice of a reference test must be available. The procedure is simulation based and proceeds as follows.

Step 1. A random response pattern is drawn from the school-advice data of the target test.

Step 2. A student with the same school-advice is sampled from the reference test. For this student we register the test-advice on the reference test.

Step 3. A random response pattern is drawn from the test-advice data of the target test.

Step 4. A student with the same test-advice is sampled from the reference test. For this student we register the school-advice on the reference test.

This results in two frequency distributions of advice categories, one if the reference test was made by the target population given their school-advice, and one if the reference test was made by the target population given their test-advice. The latter is very close to the IRT-based result, the former can be seen as an alternative that is closer to the school-advice.

Input and Output

After installing the application an icon is created on the desktop. When clicking on the icon, a shell appears which consists of several input boxes. The boxes on the left-hand side are displayed in the figure below and will be explained first. The fields have the following function.

Run Name. A run is defined in a file named RUNNAME.TSS, RUNNAME is variable, TSS is a fixed extension. The field contains the RUNNAME.

Work Directory. This field contains the folder where all input files must be present, and where all output is written.

Run Name

Work Directory

D:/AAA1-TEST-ANKER2020/

Run Type

Test Specification

tests

	Test	Label	Model	DataFile
1	1	TEST_1PLM	1	TOPIC1.DAT

Norm DataFile Specification

Categories Test Advice

	ID	Label	Model_1PLM	Model_2PLM
1	1	(pro/vmbo bb) vs (vmbo bb/kb)	-2.2186	-2.1086
2	2	(vmbo bb/kb) vs (vmbo kb/gt)	-0.5525	-0.5762
3	3	(vmbo kb/gt) vs (vmbo gt/havo)	-0.0383	-0.0556
4	4	(vmbo gt/havo) vs (havo/vwo)	0.5672	0.5742
5	5	(havo/vwo) vs (vwo)	1.0908	1.1546

Load from TSS produces a menu with which a file RUNNAME.TSS or RUNNAME.TSS0 (issued by the application) can be loaded.

Run Type is a pull-down menu for selecting subgroups of students. Their ability scores on subtests and their overall scores are either written to a file RUNNAME.BO, or to separate files RUNNAME.BO and RUNNAME.SBO, depending on the choice made using the pull-down menu.

Save TSS is meant for software developers for debugging purposes.

Run ALTNORM runs the scoring and norming application. The main output is sent to RUNNAME.OUT (ASCII file)

Test Specification can be used to define several runs. Every run pertains to a separate target test.

Norm DataFile Specification gives the name of the file with the test-advice and school-advice of the reference-test.

Categories Test Advice gives the number of advice categories and the cut-off points computed using the first procedure described above, that is, the IRT norming.

The right-hand side of the shell is displayed in the picture below.

Topic Specification starts with a pull-down menu **Label** where a target test can be selected.

Topic Specification

Label

TEST_1PLM▼

Topics

4

	Topic	Label	Weight	WRMFile
1	1	Topic1	0.3000	TEST_Topic1.WRM1
2	2	Topic2	0.4000	TEST_Topic2.WRM1
3	3	Topic3	0.2500	TEST_Topic3.WRM1
4	4	Topic4	0.1500	TEST_Topic4.WRM1

The following matrix contains the names of the subscales under the heading **Label**, the weights of the subscales under the heading **Weights** and the files with ability estimates issued from Lexter under the heading **WRMFile**.

Format of the file RUNNAME.TSS

Besides via the shell described above, scoring and norming can also be done by running the application directly from the command line by entering **Scoring RUNNAME**. A file RUNNAME.TSS must be present in the same folder where Scoring.exe is located.

The files RUNNAME.TSS and RUNNAME.TSS0 (the latter issued by the shell when the program is run from the shell) have the following fixed format.

Since the format is fixed, the positions of the entries are exactly determined, so creating these files outside the shell is not encouraged.

```
SIMPLE_EXAMPLE
D:\AlternativeScoring
0 4 5
CutOff1          -2.2186 -2.1086
```

```

CutOff2          -0.5525 -0.5762
CutOff3          -0.0383 -0.0556
CutOff4          0.5672 0.5742
CutOff5          1.0908 1.1546
REFERENCE.DAT
4 2 TEST1_LABEL
TEST1_TOPIC1.DAT
0.3000 Topic1    TEST1_TOPIC1.WRM2
0.4000 Topic2    TEST1_TOPIC2.WRM2
0.2000 Topic3    TEST1_TOPIC3.WRM2
0.1000 Topic4    TEST1_TOPIC4.WRM2
4 1 TEST2_LABEL
TEST2_TOPIC1.DAT
0.3000 Topic1    TEST2_TOPIC1.WRM1
0.4000 Topic2    TEST2_TOPIC2.WRM1
0.2000 Topic3    TEST2_TOPIC3.WRM1
0.1000 Topic5    TEST2_TOPIC5.WRM1
3 1 TEST3_LABEL
TEST3_TOPIC1.TXT
0.3000 Topic1    TEST3_TOPIC1.WRM1
0.4000 Topic2    TEST3_TOPIC2.WRM1
0.3000 Topic3    TEST3_TOPIC3.WRM1
3 1 TEST4_LABEL
TEST4_TOPIC1.TXT
0.3000 Topic1    TEST4_TOPIC1.WRM1
0.4000 Topic2    TEST4_TOPIC2.WRM1
0.3000 Topic3    TEST4_TOPIC3.WRM1

```

Record 1: Run name (200 positions)

This record contains the run name, it can take up to (200) positions and states the name as under Run Name field.

Record 2: Work Directory (200)

This record contains the Work Directory (200): NOTE: forward or backward slashes

Record 3: Sample type, number of tests and categories (2, 2, 2)

This record will contain three numbers, each on 2 positions:

- a 0/1 indicator (2) saying whether it is BO = 0 or BO&SBO =1
- the # number of tests as selected by user (2)
- then the number of advice categories as selected by user minus 1, to state the amount of cutoff values. For instance, if # advice categories is 6, the value 5 will be printed in the .TSS file (2)

Record 4: Cutoff values

The name of the cutoff as specified under column "Label" (32), Value under column "1PLM" (8.4), Value under column "2PLM" (8.4)

Record 5: Name of the Norm data file

Name of the Norm datafile as filled in under "Norm DataFile Specification" (20)

Record 6 and further: number of topics, model and name coming from Label

As of Line 6, the contents of the table on Test Specification and on Topic Specification are shown. The first row contains information from the first test of Test specification; the label and the model, and combine this with the Number of topics specified under # topics in Topics specification:

- Line 1: #number of topics (2), type of model = 1 or 2 (2), and Name of Test coming from the label (20)
- Line 2: Name of datafile (20)
- Further lines: After this, for each test, all the rows from "Topic Specification" are shown, with one line per topic: Weight(8 positions, rounded off at 4 decimals), Label of Topic (20, but first position is a space), Filename as specified (20, but first position is a space)

The sequence of lines above is done for each test, so that each of them has 2 fixed lines and the further lines have a varying amount of lines depending on the number of topics in the test.