

SAS NIH Toolbox Cognition Battery Rescoring Program - Instructions

Version 1.1

April 2017

NOTE: This rescoring program should be used only after careful review of the NIH Toolbox Analysis Guide. The program is intended for use by NIH Toolbox iPad users who exported data *prior* to the rescoring update (App v1.8 released on Dec 19, 2016) AND deleted that data from the iPad. Users with existing data still on the iPad have had their data automatically rescored by the updated NIH Toolbox app, and do not need to use this program.

There are two versions of the SAS NIH Toolbox Cognition Battery Rescoring Program, depending on the operating system under which SAS is running. There is a version for SAS running locally on a Windows machine. The second version is for iOS and Linux operating systems, including SAS University Edition.

The accompanying SAS macro will rescore the NIH Toolbox Dimensional Change Card Sort (DCCS), Flanker, Picture Sequence Memory, and Pattern Comparison Tests and calculate normative and composite scores (if all tests necessary for the composite were administered) using these rescored values. It also calculates the normative scores for tests which were equivalent across mode of administration: NIH Toolbox Picture Vocabulary, Oral Reading, and List Sorting Tests.

IMPORTANT: FOR USE IN SAS, WITH NIH TOOLBOX IPAD EXPORTS PRIOR TO THE RESCORING UPDATE

How to use this program:

INPUT: You will need to supply the file path and file names for three data export .csv files as inputs to the macro call. Exported files will have names similar to these listed below; however, you may have saved them under different names:

1. YYYY-MM-DD XX.XX.XX Registration Data.csv
2. YYYY-MM-DD XX.XX.XX Assessment Scores.csv
3. YYYY-MM-DD XX.XX.XX Assessment Data.csv

OUTPUT: a SAS dataset in the WORK directory, named 'final,' which you should save to a permanent location of your choosing, or export to your preferred file format.

EXAMPLE WINDOWS MACRO CALL: place your path and filenames in the macro call at the very bottom of the program; you do not need to change anything else

```
%TBrescore(path=C:\Toolbox\iPad\Study data,  
            reg=2017-01-17 11.00.15 Registration Data,  
            scores=2017-01-17 11.00.15 Assessment Scores,  
            assessment=2017-01-17 11.00.15 Assessment Data);
```

Here is an example where the export files have been renamed from the default naming structure:

```
%TBrescore(path=C:\Toolbox\iPad\Study data,  
            reg=Real Data Before Registration,  
            scores=Real Data Before Scores,  
            assessment=Real Data Before Assessment Data);
```

EXAMPLE MAC/LINUX MACRO CALL: The main difference between Windows and Mac/Linux macro calls is in the path. Windows uses backslashes ("\"), whereas Mac/Linux machines use forward slashes ("/").

```
%TBrescore(path=/Toolbox/iPad/Study data,  
            reg=2017-01-17 11.00.15 Registration Data,  
            scores=2017-01-17 11.00.15 Assessment Scores,  
            assessment=2017-01-17 11.00.15 Assessment Data);
```

EXPORT DATA (OPTIONAL): If, instead of saving the temporary SAS dataset as a permanent SAS dataset, you prefer to export your data, you may copy-paste the following code to the very end of the SAS file. For Mac/Linux users, make sure the path uses forward-slashes ("/") instead of backslashes ("").

```
proc export data=final DBMS=CSV  
            OUTFILE="C:\My Documents\NIHTB\out_rescoring.csv"; /*  
                change the path to where you want to save this */  
run;
```

Appendix:

Additional Concerns for SAS University Edition

If a user is rescoring using the SAS University Edition, the following additional instructions may be useful. SAS University Edition is a free version of SAS that runs “virtually.” That means, it is accessed through a web browser. Because of this, there are special requirements in order for SAS University Edition to be able to access the NIH Toolbox iPad export files and use the rescoring program.

First, users should be aware that SAS University Edition is run on a virtual Linux machine. As such, it is necessary to use the **Mac/Linux version** of the SAS NIH Toolbox Cognition Battery Rescoring Program.

Next, when SAS University Edition is installed, it adds a folder to the user’s computer called “SASUniversityEdition”. Within this folder is a subfolder called “myfolders.” The full path for this subfolder is C:\SASUniversityEdition\myfolders. The Mac/Linux version of the SAS NIH Toolbox Cognition Battery Rescoring Program and all exports from the NIH Toolbox iPad app need to be copied and pasted into this subfolder in order for SAS University Edition to be able to access them.

If the files are copied and pasted correctly, when the user opens SAS University Edition, the file names should appear on the left-hand side of the SAS Studio screen. Open the .sas script and modify the macro call at the bottom of the page. The Reg, Scores, and Assessment lines should be changed to match the file names (as is usual). However, the path for SAS University Edition is “/folders/myfolders” in order for it to access the correct files. (Note: other folders can be mapped to SAS University Edition, should a user so desire, but this is a much more complicated process than simply copying and pasting the export files into the “myfolders” subfolder.)

An example macro call for SAS University Edition would look like this:

```
%TBrescore(path=/folders/myfolders,  
            reg=2017-01-17 11.00.15 Registration Data,  
            scores=2017-01-17 11.00.15 Assessment Scores,  
            assessment=2017-01-17 11.00.15 Assessment Data);
```

Likewise, if a user wants to export the rescored values, he or she modify the proc export statement with the correct path. For example, the following lines would create a file called “out_rescoring.csv”. This file will be placed in the C:\SASUniversityEdition\myfolders subfolder (where the NIH Toolbox iPad app export files were copied and pasted).

```
proc export data=final DBMS=CSV  
            OUTFILE="/folders/myfolders/out_rescoring.csv";  
run;
```