

NIH Toolbox Registration Data File Template Instructions

The NIH Toolbox Cognition Battery provides three types of normative scores, including Uncorrected Standard Scores, Age-Corrected Standard Scores, and Fully Corrected T-Scores. The web-based version of the Toolbox did not calculate these scores, but the NIH Toolbox iPad App automatically calculates them, provided that the relevant demographics are input into the Registration file for each participant:

- Uncorrected Standard Scores are always calculated
- Age-Corrected Standard Scores are calculated provided that date of birth is provided in the Registration file. Age is calculated at each time of assessment and exported from the app. Date of birth is not exported but stored internally to calculate age at time of future assessments.
- Fully Corrected T-Scores are calculated when date of birth, gender, race, ethnicity, and education (or maternal education for children aged 3 to 17 years) is provided.

Occasionally, a researcher or clinician may want to calculate normative scores that require demographic information not originally entered into the app, or he/she may discover that inaccurate information was entered for a participant. In these cases, it is desirable to correct the demographics information and recalculate scores. ***Currently, the app does not provide a means for correcting normative scores for existing assessments when demographic data were not entered or need to be modified after registration.*** Normative scores are calculated based on the demographics entered at the time of assessment; future assessments will use updated demographic data entered at those later times (if the demographic change precedes the subsequent assignment of the assessments), but existing assessments are not changed.

Recalculating normative scores is possible outside of the iPad app, using a SAS program. Many universities have SAS available in libraries or computer labs. Additionally, SAS offers a free program (“University Edition”) that runs virtually and that can also be used for calculating normative scores. The SAS code, originally designed for another purpose (re-scoring cognition data), can also be used to recalculate normative scores when demographic data have been modified. The SAS program is available here <https://nihtoolbox.desk.com/customer/en/portal/articles/2773497-sas-nih-toolbox-cognition-battery-rescoring-program-and-instructions>. For the SAS code to work accurately, it requires that all files be appropriately formatted. We have created a template for the Registration Data file, which will ensure correct formatting and coding. The Registration Data file contains all of the participant demographic information. It should be noted that the SAS program requires all three NIH Toolbox exports – Assessment Scores, Assessment Data, and Registration Data. However, only the Registration Data file needs to be changed to update the scores with the new/corrected demographics.

We recommend adjusting and updating the Registration Data file using our file template, which is designed exactly like the NIH Toolbox Registration Data file export. This template ensures that all values are appropriately coded and will be used instead of the exported Registration Data file when using the SAS program. The appendix to this document provides the data model for the registration template, including what columns are required for which scores. To add or correct demographics use these steps (for additional questions or assistance with this template, please contact help@nihtoolbox.org):

1. Open the Excel file named “TB Registration Template”, you may need to confirm that you want to “Enable Macros” or “Enable Content.”
 2. Enter the *PIN* and *Assessment Name* for the record that needs to be changed. These values are case-sensitive and **must** match the Assessment Scores and Assessment Data files **exactly**. Double check whatever is entered into these fields to ensure they exactly match the other files.
 3. Use the drop-down list for Age to select the age in years at time of assessment for Age-Corrected Standard Scores.
 4. Use the drop-down list for Age, Gender, Race, Ethnicity and either Education (for individuals aged 18+) or MothersEducation (for individuals aged 3-17) for Fully Corrected T-Scores.
 5. Choose “File” and “Save as” to save this template. Save it as a “CSV (Comma Delimited)” file with a name that will be clear it is the updated Registration Data file that should be used in the SAS program.
 6. Run the SAS program. For more information on using the SAS program, see the instructions accompanying it.
- All of the drop-down lists in the Registration Template convert text descriptions to appropriate numeric codes.

Appendix: Data Model for the Registration Data File Export

Field (Template columns)	Entry Method	How it is used in scoring:	In-Template Instructions	Additional Notes
PIN	varchar	Required for all scores		This is a case-sensitive field that must exactly match the PIN used in the scores and data files
DeviceID	varchar	Not used		
Name	varchar	Not used		
Age	list to numeric	Required for Age-Corrected Standard Scores and Fully-Corrected T-Scores	Please select the examinee's age in years at the time of the assessment.	
Education	list to numeric	Required for Fully-Corrected T-Scores for adults (age 18+ years)	Select the highest grade that the examinee has COMPLETED.	This field is a drop-down list with text that provides a numeric code as output. Please ensure that the highest grade COMPLETED is chosen. Thus if a person is currently in 10 th grade, then 9 th grade is the highest completed grade and thus should be selected.
MothersEducation	list to numeric	Required for Fully-Corrected T-Scores for children (age 3-17 years)	If the examinee is a child (age 3-17), please select the highest grade that his or her mother has COMPLETED.	This field is a drop-down list with text that provides a numeric code as output. Please ensure that the highest grade COMPLETED is chosen. Thus if a person is currently a 3 rd year student in college, then the most appropriate choice is "Two years of college at a 4-year program, no degree".
FathersEducation	varchar	Not used		
GuardiansEducation	varchar	Not used		
StartingLevelOverride	varchar	Not used		
Gender	list to numeric	Required for Fully-Corrected T-Scores	Select the examinee's gender.	This field is a drop-down list with text that provides a numeric code as output.
Handedness	varchar	Not used		
Race	list to numeric	Required for Fully-Corrected T-Scores	Select the racial group with which the examinee identifies.	This field is a drop-down list with text that provides a numeric code as output.
Ethnicity	list to numeric	Required for Fully-Corrected T-Scores	Select the ethnic group with which the examinee identifies.	This field is a drop-down list with text that provides a numeric code as output.
Assessment Name	varchar	Required for all scores		This is a case-sensitive field that must exactly match the Assessment Name used in the scores and data files