

NIH Toolbox Accessibility and Accommodations - Quick Reference

The NIH Toolbox Assessment of Neurological and Behavioral Function is designed to assess discrete aspects of neurological function across 4 broad domains, namely cognition, motor, emotion and sensation. The NIH Toolbox is designed to capitalize on state-of-the-science measurement technologies and uses a variety of computer administered, computer adapted and non-computer based assessments. Instrument developers (both content experts and information technology experts) have operationalized these discrete neurological functions to make them measureable.

Each individual measure can be thought of as having 4 components:

- 1) instructions – the participant is provided with instruction on the task demands
- 2) stimulus presentation – the participant is presented with a stimulus that they must process and respond to
- 3) functional performance of the core task demand
- 4) response entry – the participant must provide a respond to demonstrate task performance.

Issues in the human-computer interaction can pose accessibility barriers for some participants, especially those with physical, cognitive, and sensory impairments and disabilities. These disabilities may be congenital, or acquired (either traumatically, through the onset of disease processes or due to age related declines). United States Census data indicates that 57 million people in the United States live with a disability, representing 19% of the civilian noninstitutionalized population. Figure 1 provides a schematic representation of the assessment process and the purple arrows highlight aspects of the human-computer interaction where accessibility issues may occur.



Figure 1

End users make certain assumptions of the NIH Toolbox results, based on its rigorous development process that included psychometric evaluation of reliability, validity and norm referencing. Because they are tests of functioning, making them accessible to those with disabilities without compromising the integrity of the test can involve a delicate balance. In certain cases making an accommodation can result in a fundamental alteration of the task or assessment. Please refer to the document *NIH Toolbox Reasonable Accommodations* for complete discussion and detailed guidance. The following alternatives are available for those participants who wish to use them.

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For those with auditory impairment:

- Directions which are typically read by the examiner can be presented in written form. Many are presented on the examiner screen and can be shown to participant. Instructions can also be printed on paper from the training and administration manuals.
- Audio stimuli: many instruments have an audio component. If a participant has difficulty hearing the stimuli, the examiner should increase the sound volume on the computer (use headphones if they help). For the Picture Vocabulary test the examiner can repeat the word for the participant.

For those with visual impairment:

- Participants can use the Internet Explore (IE) zoom feature to increase the font size of self-report measures. Pressing CTRL + (Ctrl and plus sign key simultaneously) increases zoom level; CTRL- (minus sign) decreases zoom level. Screens may scroll when using this option.
- A larger monitor can help those with visual impairment. Care should be taken not to compromise validity of vision or cognition instruments, such as:
 - ✓ A 19" monitor with a screen resolution of 1440 x 900 is required for the static or dynamic visual acuity measures. A larger monitor or wrong resolution will alter the size of the optotypes.
 - ✓ Increasing stimulus size on a larger monitor will affect the administration of several cognition measures (Flanker, DCCS, PSM), potentially making them easier and invalidating the norms.
- Those with visual impairment can use standards-based screen reader software to read the content of self-report measures such as those in the Emotion domain. (IN PROGRESS)
- If using a mouse is difficult, participants can select answer options using the keyboard: ALT- 1, ALT-2, ALT-3, ALT-4, etc. selects that response option. On multiple choice items, the numbering starts at the top and ends at the bottom. For likert scale items, the numbering starts at the left and proceeds to the right. For graphic response options with 4 pictures, such as in Picture Vocabulary or Odor Identification, the response option numbering begins at the upper left picture and ends at the lower right as shown below:

1	2
3	4

- The self-report instruments are configured to so that the screen automatically moves to the next item once a response option is chosen. Because of this, the navigation buttons are: Go back and Skip. To invoke Go back, the participant should press ALT-b; for Skip the participant should press ALT-k. There will be a prompt, Do you want to skip this item? ENTER confirms and Esc cancels. This is true for English and Spanish participants, even though the buttons are translated into Spanish. On instruction screens participants should use ENTER to continue.