March 25, 2020

TestMyBrain Digital Neuropsychological Toolkit:
Requesting Access and How to Use

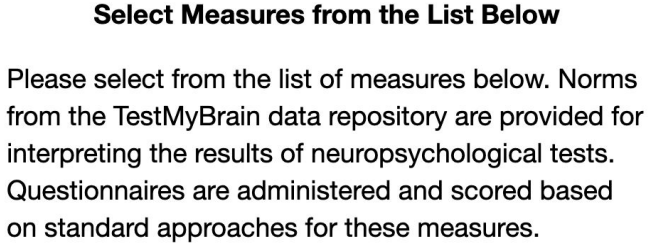
To request access to the toolkit, please email testmybrain@gmail.com or fill out this form: https://forms.gle/unKrUWACzMAMUvzY7

I. About the TMB Digital Neuropsychology Toolkit

The TestMyBrain Digital Neuropsychology toolkit is a not-for-profit program developed out of Harvard Medical School and McLean Hospital (co-supported by the 501c3 Many Brains Project). Over the last 12 years, the TestMyBrain platform has tested over 2.5 million people and is currently being used for research and education at 250 sites internationally. Given the current pandemic, our team realizes the immediate need for digitized assessments that are freely available and readily accessible for clinical neuropsychologists. We are consolidating tests that will be most useful for clinicians, so they can be used as a resource to perform urgent evaluations remotely. Our test list will be updated based on clinicians' requests so that we are adequately meeting demands. The tests on our platform have been empirically evaluated and are comparable to traditional neuropsychological instruments, but are not the same, which should resolve many issues related to test security. Clinicians may use these tools at their own discretion, understanding they were developed for research rather than diagnostic purposes. For example, clinicians may choose to send a link for patients to complete a selected set of tests, and if desired, clinicians may use the screenshare function on a HIPAA-compliant platform to observe patients complete the tasks.

II. Building a Battery

1. Users will first be prompted to build a battery or participant session. Tests available through the toolkit are described at the end of this document.

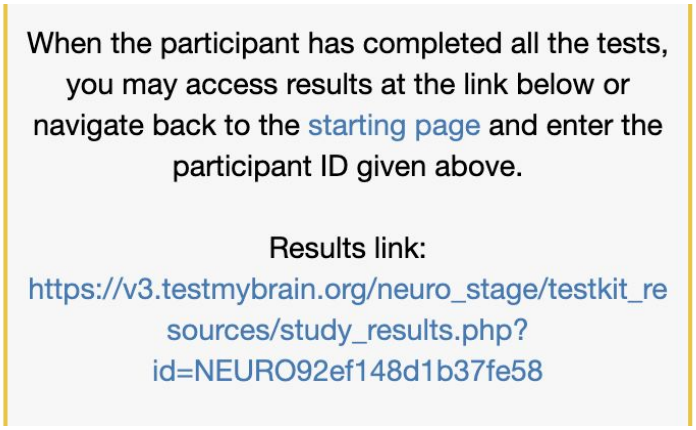


- [ ] TMB Simple and Choice Reaction Time
- [ ] TMB Gradual Onset Continuous Performance Test
- [ ] TMB Matrix Reasoning
- [ ] TMB Trail Making Test (Parts A + B)
- [ ] TMB Forward Digit Span
- [ ] TMB Backward Digit Span
- [ ] TMB Verbal Paired Associates - Learn & Test (TMB Choice Reaction Time)
- [ ] TMB Visual Paired Associates - Learn & Test (TMB Choice Reaction Time)
- [ ] TMB Digit Symbol Matching

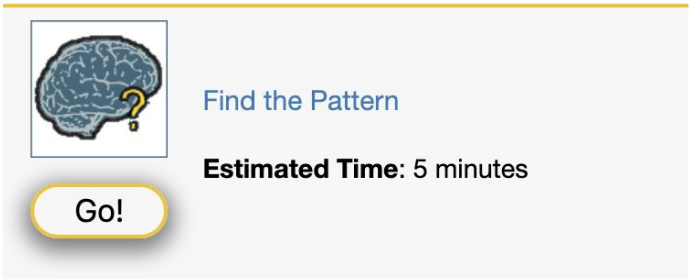
2. This will create a battery link that can be sent to a participant. Each link is good for one testing session.

> Congratulations. Your battery has been successfully created. This battery can be used for one testing session only.To run multiple sessions (multiple participants or multiple time points), please navigate back to the starting page and create a new test battery for each testing session.
>
> The participant ID for this battery is:
> **NEURO92ef148d1b37fe58**
>
> Please store this ID in a secure location as you will need it to access results once testing is complete. To maintain the confidentiality of test scores, we are unable to retrieve results without a participant ID.
>
> The link to your battery is given below. Participants should use this link to access their testing session.
>
> Battery Link:
> https://v3.testmybrain.org/neuro_stage/get_id.php?id=NEURO92ef148d1b37fe58

3. You will also receive a results link. This can be used to access the results for that participant.



4. Links can be sent to participants via email or SMS. When the participant clicks on the link they will be directed to the tests selected.



III. Retrieving Results

Users can use the participant ID or link at set up to retrieve results. Results look like this. You can also download the raw trial-by-trial data for more granular information. Codebooks are included for all available tests.

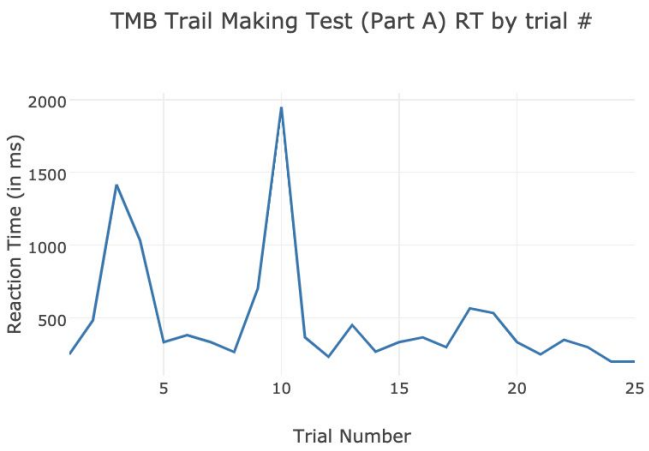
Summary scores for this test are given below.

TA.mRT: 334

TA.total: 12204

TA.errors: 1

The graph below shows how participant response times varied across each item of this test. The x-axis indicates trial or question number. The y-axis indicates time in milliseconds. Response times can be a good indicator of areas where the participant had trouble, took a break, and began responding extremely quickly.



Click here to download raw data for this questionnaire or test

Finally, users can look up associated Z scores in our normative tables.

Gender: F

Age: 21-30

Years of Education: 7-11

Normative data are provided in z-score units, presenting the number of stanc
Where possible, all norms are coded such that higher (or more positive) z sc
See below table for description of test-specific column headings.

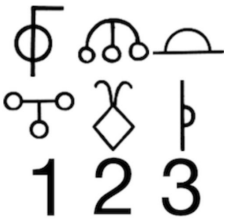
gender	age	education	Z	SRT	CRT.RT	CRT.ACC	BDS	FDS	DSM
F	21-30	7-11	-4	581	1208	0.6			
F	21-30	7-11	-3.75	564	1182	0.62			3
F	21-30	7-11	-3.5	548	1157	0.64			6
F	21-30	7-11	-3.25	532	1131	0.67			10
F	21-30	7-11	-3	515	1105	0.69			13
F	21-30	7-11	-2.75	499	1079	0.71			16
F	21-30	7-11	-2.5	482	1054	0.73		2	19

IV. Available Tests

For each test below, completion time reflects the average duration from start to finish (including instructions and practice) for each test, based on the normative sample. Normative samples vary across tests from 4,000 to 60,000 participants. All tests are compatible with laptop/desktop devices and touchscreen devices, although the Trail Making test can only be completed on a tablet (or laptop/desktop) due to screen size limitations. Note that data can vary across devices due to hardware characteristics, particularly for tests with large complex stimuli or that depend on speeded reaction times. Tests require up-to-date browser software (i.e. any browser updated in the past 5-7 years).

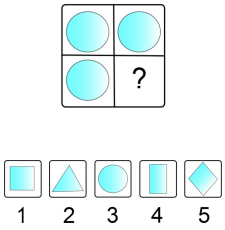
These tests were developed based on partnerships with academic and industry partners (see Acknowledgments below), and are distributed under a CC-BY-SA license by The Many Brains Project and McLean Hospital. These tests are developed using a combination of HTML5 and JavaScript, and use the TestMyBrain.js library (developed by the Many Brains Project), which is distributed under a CC-BY-ND license. Development of tests is funded by federal grants, contracts, and/or public / private partnerships.

To receive more information about a specific test (e.g. references, validation information, or size of normative sample), please contact us.



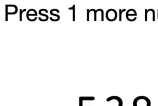
TMB Digit Symbol Matching
Using a symbol-number key shown on screen, match as many symbols and numbers as possible in 90 seconds.
This test measures processing speed.

Average Completion Time: 2 minutes
Mobile Device Compatible: YES



TMB Matrix Reasoning
Identify the image that best completes the pattern in a series, based on a logical rule. This test measures fluid cognitive ability and perceptual reasoning.

Average Completion Time: 8 minutes
Mobile Device Compatible: YES



TMB Digit Span
Recall sequences of digits of increasing length, either in the same order as presented (forward digit span) or in the opposite order (backward digit span). This test measures auditory span, short term memory, attention, and working memory (backward version). The

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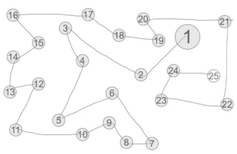
two subtests can be administered alone/individually or together for any given project.

Average Completion Time: 3.5 minutes (each)
Mobile Device Compatible: YES

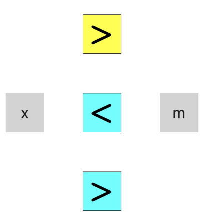


TMB Trail-Making Test
Connect a series of numbers in ascending order (Part A) or numbers and letters in alternate ascending order (Part B). This test measures processing speed, task switching (Part B), and cognitive flexibility (Part B). The two subtests can be administered alone/individually or together for any given project.

Average Completion Time: 2 minutes (each)
Mobile Device Compatible: TABLET ONLY (larger screen size needed)

TMB Simple Reaction Time
Press a key whenever a green square appears. This test measures basic psychomotor response speed.

Average Completion Time: 1 minute
Mobile Device Compatible: YES



TMB Choice Reaction Time
Indicate the direction of the arrow that is a different color from the rest. This test measures processing speed, response selection/inhibition, and attention.

Average Completion Time: 2.5 minutes
Mobile Device Compatible: YES

SKY – ?

1. POT
2. PAN
3. BLUE
4. DISH

TMB Verbal Paired Associates Memory
Learn and then recognize a set of word pairs. Word pairs are selected to be either abstract (hard versions) or concrete (easy versions). This test measures verbal memory and episodic memory.

Average Completion Time: 5 min total (not including delay between memorization and test, when other tasks can be completed)
Mobile Device Compatible: YES

Acknowledgments: Christopher Chabris, Geisinger Health

TMB Visual Paired Associates Memory
Learn and then recognize a set of picture pairs (scene images). This test measures visual memory and episodic memory.

Average Completion Time: 5 min total (not including delay between memorization and test, when other tasks can be completed)
Mobile Device Compatible: YES

Acknowledgments: Images from MIT SUN Database (Xiao et al., 2010)

TMB Gradual Onset Continuous Performance Test (gradCPT)
Press a key when a city image appears and *do not press* when a mountain image appears. Images rapidly transition from one to the next, with mountains appearing only 10 - 20% of the time. This test measures sustained attention, response inhibition, and cognitive control.

Average Completion Time: 6 min
Mobile Device Compatible: YES

Acknowledgments: Mike Esterman and Joe DeGutis, Boston Attention Lab, BVARI