

Cognitive Task Overview: TestMyBrain Choice Reaction Time

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TMB Test Name: TestMyBrain Choice Reaction Time

Test Demo: [standard version](#)

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The Many Brains Project

[The Many Brains Project](#), is a 501(c)(3) non-profit that supports TestMyBrain (TMB) in collaboration with the [Laboratory for Brain and Cognitive Health Technology at McLean Hospital](#) and Harvard Medical School. We currently support many different types of research studies through our infrastructure for cognitive assessment - these range in size from small lab-based pilot studies to large longitudinal, multisite clinical research studies with tens of thousands of participants. As TestMyBrain has been continuously in operation since 2008, we provide a stable and secure platform for hosting and delivering mobile and web-based cognitive assessment protocols. Through TestMyBrain.org, data have been collected from over 3.7 million participants in a *citizen science* framework that includes structured return of research results toward the development, validation, and normative characterization of cognitive measures. We currently support research and education at over 2,000 sites worldwide engaged in digital neuropsychological assessment.

CITATION

Please credit The Many Brains Project and TestMyBrain in any papers, posters, or publications related to the TMB tests or data collected by TMB tests.

- Example:
 - All tasks were selected from and hosted on The Many Brains Project's web-based cognitive testing platform, TestMyBrain (Germine et al., 2012; The Many Brains Project).
 - Germine, L., Nakayama, K., Duchaine, B. C., Chabris, C. F., Chatterjee, G., & Wilmer, J. B. (2012). Is the Web as good as the lab? Comparable performance from Web and lab in cognitive/perceptual experiments. *Psychonomic Bulletin & Review*, 19(5), 847-857.
 - The Many Brains Project. *TestMyBrain Cognitive Tests*. URL: www.manybrains.net

Test Overview

Background:

TMB Choice Reaction Time (Germine et al., 2022; Hawks et al., 2023; Rutter et al., 2020; Singh et al., 2021) is a choice reaction time test (Donders, 1969) designed for remote, web-based administration.

Task Parameters:

On each trial, participants view three vertically aligned squares, each filled with a color (blue or yellow) and an arrow pointing either left or right, with one of the three squares always a different color than the other two. Participants must indicate the direction of the arrow in this differently-colored target square as quickly as possible, using a keyboard press (the “x” key for left, and the “m” key for right) or button press. The target square’s color (blue or yellow), position (top, middle, or bottom), and arrow direction (left or right) are chosen randomly on each trial. To avoid response preparation effects, the test uses an exponentially distributed intertrial interval ranging from 700 ms to 1500 ms. Participants complete four practice trials and 30 test trials.

Primary Outcome:

The suggested primary outcome of the test is median reaction time for correctly answered trials (medianRTc), a measure of processing speed. Researchers may also consider incorporating response accuracy (proportion of trials answered correctly).

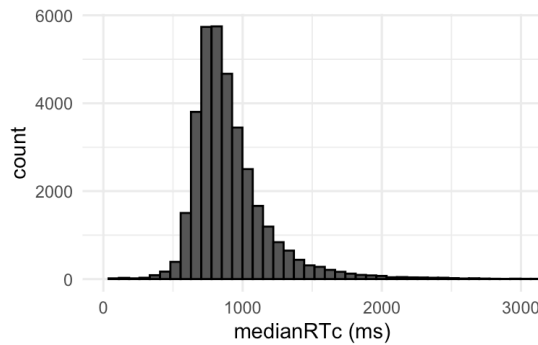
User Input:

Participants using a keyboard are instructed to use the “x” and “m” keys to make responses. If the participant’s device has touch capability, at the beginning of the test the participant will be given the option to respond using touch input or keyboard input. Otherwise, the participant must use keyboard input.

Alternate Task Versions: Alternate forms of the test are available for repeated administration. Additionally, an ultra-brief, EMA-compatible version is available (Hawks et al., 2023; Singh et al., 2023).

Psychometrics:

- **Reliability:** In single-session testing, variation in performance between participants has a split-half reliability of .95. See Hawks et al., 2023 and Singh et al., 2023 for psychometric details of multiple-session EMA administration.
- **Score distribution:**



References:

- Donders, F. C. (1969). On the speed of mental processes. *Acta Psychologica*, 30, 412-431.
- Germine, L. T., Joormann, J., Passell, E., Rutter, L. A., Scheuer, L., Martini, P., ... & Kessler, R. C. (2022). Neurocognition after motor vehicle collision and adverse post-traumatic neuropsychiatric sequelae within 8 weeks: Initial findings from the AURORA study. *Journal of Affective Disorders*, 298, 57-67.
- Hawks, Z. W., Strong, R., Jung, L., Beck, E. D., Passell, E. J., Grinspoon, E., ... & Germine, L. T. (2023). Accurate prediction of momentary cognition from intensive longitudinal data. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 8(8), 841-851.
- Rutter, L. A., Vahia, I. V., Forester, B. P., Ressler, K. J., & Germine, L. (2020). Heterogeneous Indicators of Cognitive Performance and Performance Variability Across the Lifespan. *Frontiers in Aging Neuroscience*, 12, 62.
- Singh, S., Strong, R., Xu, I., Fonseca, L. M., Hawks, Z., Grinspoon, E., Jung, L., Li, F., Weinstock, R. S., Sliwinski, M., Chaytor, N., & Germine, L. T. (2023). Ecological Momentary Assessment of Cognition in Clinical and Community Samples: Reliability and Validity Study. *Journal of Medical Internet Research*, 25, e45028.