Cognitive Task Overview: TestMyBrain GradCPT

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TMB Test Name: TestMyBrain Gradual Onset Continuous Performance Test
Test Demo: standard version
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Acknowledgements:
- Original in-lab test created by: Mike Esterman, PhD and Joe DeGutis, PhD, at the Boston Attention and Learning Lab (https://www.bu.edu/ballab/index.html)

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:
The TestMyBrain Gradual Onset Continuous Performance Test (GradCPT; Fortenbaugh et al., 2015; Riley et al., 2016, 2017; Singh et al., 2021; Treviño et al., 2021; Vogel et al., 2020), adapted from Esterman et al. (2013) and Rosenberg et al. (2013), is a test of sustained attention and inhibitory control, a core aspect of executive functioning.

Task Parameters:
Participants view a sequence of 300 circular, grayscale images of cities and mountains constructed to have equal mean luminance and contrast, with the images gradually transitioning from one to the next every 800 ms. Participants are instructed to make a keyboard press (keyboard input) or tap the screen (touch input) when images of cities are presented (89.3% of trials), and withhold from responding when mountain images are presented (10.7% of trials). The total duration of the image sequence is 4 minutes. Participants complete 36 unscored practice trials before beginning the 300 test trials. All participants view the same images in the same order.

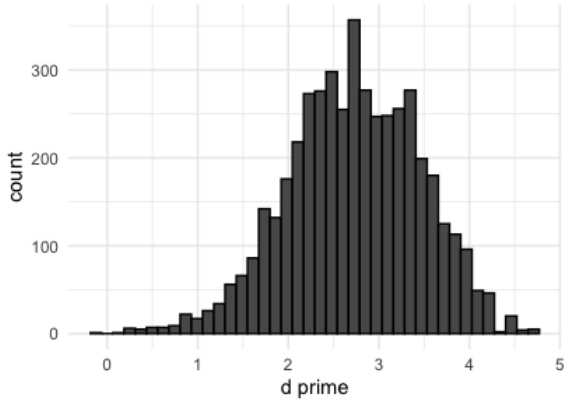
Primary Outcome:
The test's suggested primary outcome is discrimination ability (d prime), a measure of response accuracy unaffected by response bias, which represents the participant's ability to withhold responses to mountains while making responses to more prevalent city images. Secondary outcome measures of interest include response bias, commission error rate, reaction time, and reaction time variability. See Stanislaw & Todorov (1999) and the supplement of Fortenbaugh et al. (2015) for instructions on calculating d prime and other outcomes of interest.

User Input:
Participants using a keyboard are instructed to use the spacebar when making responses, but the test will accept responses from any key. 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, shorter versions are available, including an ultra-brief, EMA-compatible version (Hawks et al., 2023; Singh et al., 2023).

Psychometrics:

- **Reliability**: In single-session testing, variation in performance (dprime) between participants has a split-half reliability of .86. See Hawks et al., 2023 and Singh et al., 2023 for psychometric details of multiple-session EMA administration.
- **Score distribution**:



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