Brain Health Registry Layout: Cognitive Tests and Their Descriptions

Table of Contents

Cogstate

Card Test Description

The Card Test is provided by Cogstate to gauge cognitive performance. Four cognitive domains are measured through four subtests in the form of card games:

1. Detection Test: Measures processing speed.
    a. Asks the question, “Has the card turned over?”
2. Identification Test: Measures attention.
    a. Asks the question, “Is the card red?”
3. One Card Learning Test: Measures visual learning.
    a. Asks the question, “Have you seen this card before?”
4. One Back Test: Measures working memory.
    a. Asks the question, “Is this card the same as the pervious card?”

Participants are to complete all subtests on either a desktop computer, laptop, or tablet device. At the beginning of each task, written instructions are presented on the screen and describe the task rules. Participants are then given an interactive demonstration, and once they have successfully demonstrated they understand the rules, the task will begin. For each task, participants respond with either “yes” or “no” using the “d” and “k” keys on the keyboard.

Cogstate’s supervised version has clinical validity, reliability, and sensitivity to age effects and is used with MCI subjects.[1] Previous reports have validated Cogstate’s use by unsupervised participants at home, including from Mayo Clinic and ADNI.

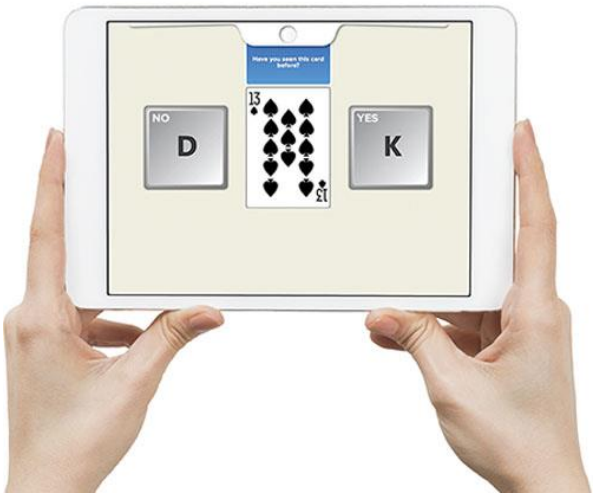

Figure 1: Example of The Card Test. Retrieved from Cogstate.com (November 2018).

[1] Racine, A. , et al. (2016). Associations between Performance on an Abbreviated CogState Battery, Other Measures of Cognitive Function, and Biomarkers in People at Risk for Alzheimer's Disease. *Journal of Alzheimer's disease : JAD*, *54*(4), 1395-1408.

Lumosity

NeuroCognitive Performance Test Description

Lumosity's NeuroCognitive Performance Test presents four short, game-like tasks that measure performance across cognitive domains:

1. Go/No-Go Test: Measures information processing speed.
    a. The participant clicks the keyboard's spacebar, as fast as possible, each time they see a specific picture that is presented to them in the instructions.
2. Reverse Memory Span Test: Measures memory and attention.
    a. Circles will light up on the screen in a particular pattern. The participant clicks the circles in the reverse order they light up. The sequence becomes longer as the participant progresses.
3. Trail Making B: Measures executive function.
    a. The participant clicks, as fast as possible, on the circles in order, alternating numbers and letters: 1, A, 2, B, 3, C, etc.
4. Memory Span Test: Measures memory and attention.
    a. Similar to the Reverse Memory Span, but not in reverse. The participant clicks the circles in the order they light up. [2]

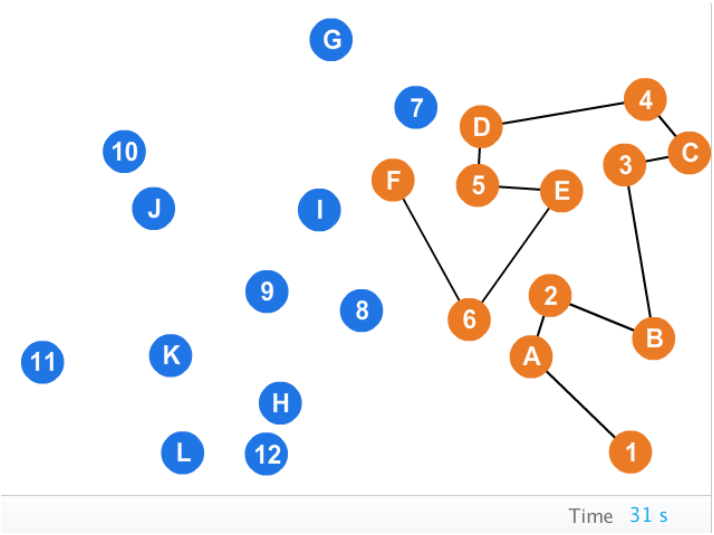

Figure 2: Example of Trail Making B test. Retrieved from Lumosity.com (November 2018).

[2] Hardy, J. L., et al. (2015). Enhancing Cognitive Abilities with Comprehensive Training: A Large, Online, Randomized, Active-Controlled Trial. *PloS one*, *10*(9).

MemTrax

Brief Memory Test Description

The Brief Memory Test measures information processing speed and memory. The participant is shown a series of images. Every time the participant sees an **exact repeat** of any image shown previously, the participant presses, as fast as possible, the spacebar on the keyboard. Reaction time, which is based on how quickly the spacebar is pressed, is recorded. [3]

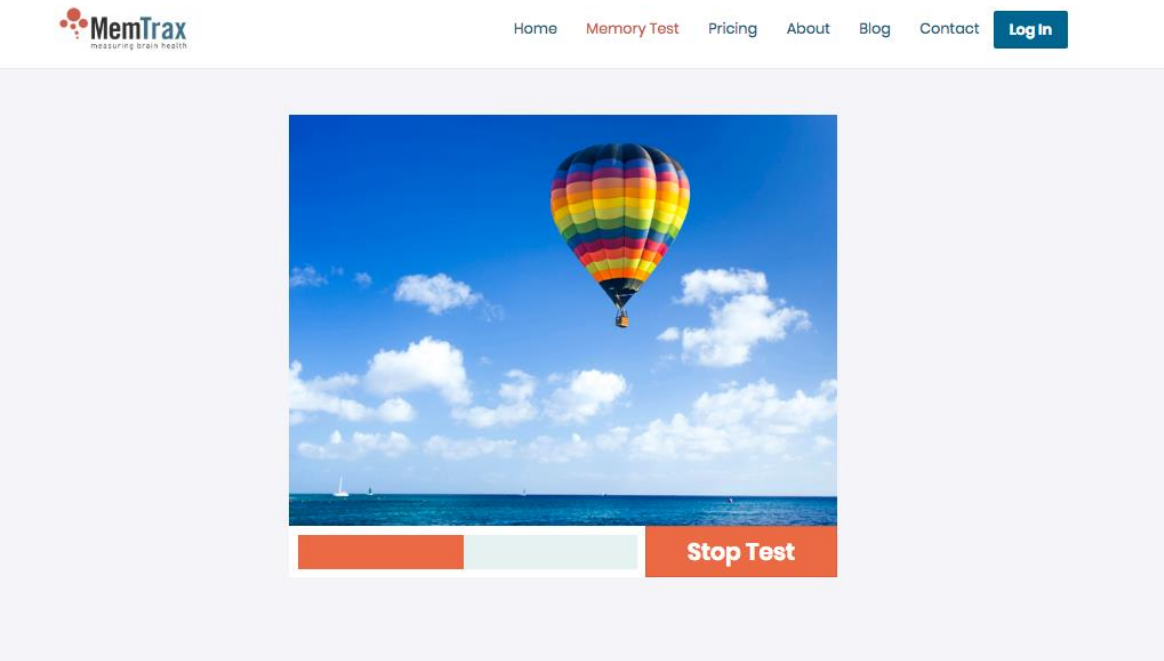

Figure 3: Example of the Brief Memory Test. Retrieved from MemTrax.com (November 2018).

[3] Ashford, J. W. (2005). Memtrax computerized memory test, a one-minute dementia screen. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, *1*(1), S23.