

Cognitive Task Overview: TestMyBrain Adaptive Delay Discounting

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TMB Test Name: TestMyBrain Adaptive Delay Discounting

Test Demos: [standard version](#) | [ultra-brief 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:

TestMyBrain Adaptive Delay Discounting (Germine et al., 2022; Stern et al., 2024), is an adaptive measure of decision making and temporal discounting (Levitt, 1971; Mazur, 1987; Myerson & Green, 1995; Yoon & Higgins, 2008) designed for remote, unsupervised administration.

Task Parameters:

On each trial, the participant chooses between 2 monetary rewards, one delivered immediately, the other delivered in the future. The immediate reward varies, while the future reward is always \$1000, with varying delays. The immediate reward is adjusted after every choice by a staircase procedure designed to home-in on the indifference point (i.e. the immediate value that is equivalent to the future value for the user) at each delay time. It is assumed that value is discounted in time according to a hyperbolic model. Using the model, the discounting factor K is computed separately for each delay time and then averaged. The score is reported to participants as the delay (months) at which the present value is halved, computed as $1/k$.

Primary Outcome:

The suggested primary outcome is the natural log of the average of the discounting factors computed for each delay time.

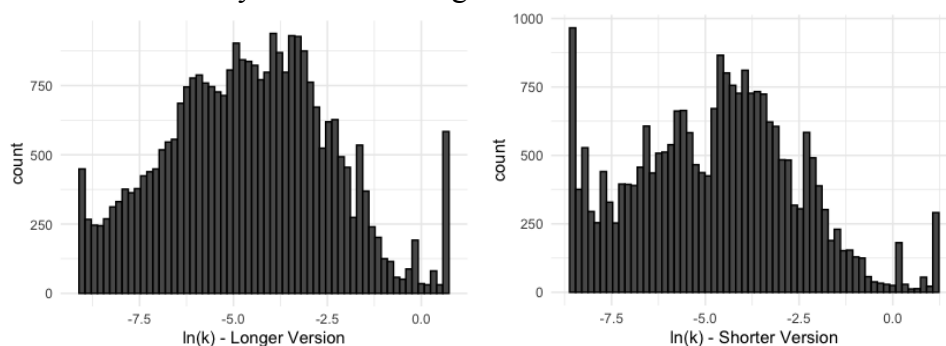
User Input:

Participants can respond by clicking their response, or using the a/b keys on the keyboard.

Alternate Task Versions: There are two forms of the test available. The shorter (ultra-brief) version has four delay periods (two weeks, one month, one year, ten years), while the longer (standard) version has three additional delay periods (six months, three years, five years).

Psychometrics:

- **Reliability:** In single-session testing, variation in performance between participants has a Cronbach's alpha of .94 for the longer version and .87 for the shorter version.
- **Score distribution:**
 - note that participants who always prefer more money in the future are to the far left of the distribution, whereas participants who always prefer less money immediately are to the far right.



References:

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- Mazur, J. E. (1987). An adjusting procedure for studying delayed reinforcement. In: Quantitative Analysis of Behavior: Vol. 5 the Effect of Delay and Intervening Events on Reinforcement Value. Commons, M. L., Mazur, J., Nevin, J. A., Rachlin, H. Erlbaum. Hillsdale, NJ. 55-73.
- Myerson, J., Green, L. (1995). Discounting of delayed rewards: Models of individual choice. *J Exp Anal Behav*. 64, (3), 263-276.
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- Yoon, J. H., & Higgins, S. T. (2008). Turning k on its head: comments on use of an ED50 in delay discounting research. *Drug and Alcohol Dependence*, 95(1-2), 169-72.