

Note: this document may not describe the most recent version of this cognitive test available from TestMyBrain. TestMyBrain cognitive test documentation will be updated over the next several months to align with current test versions.

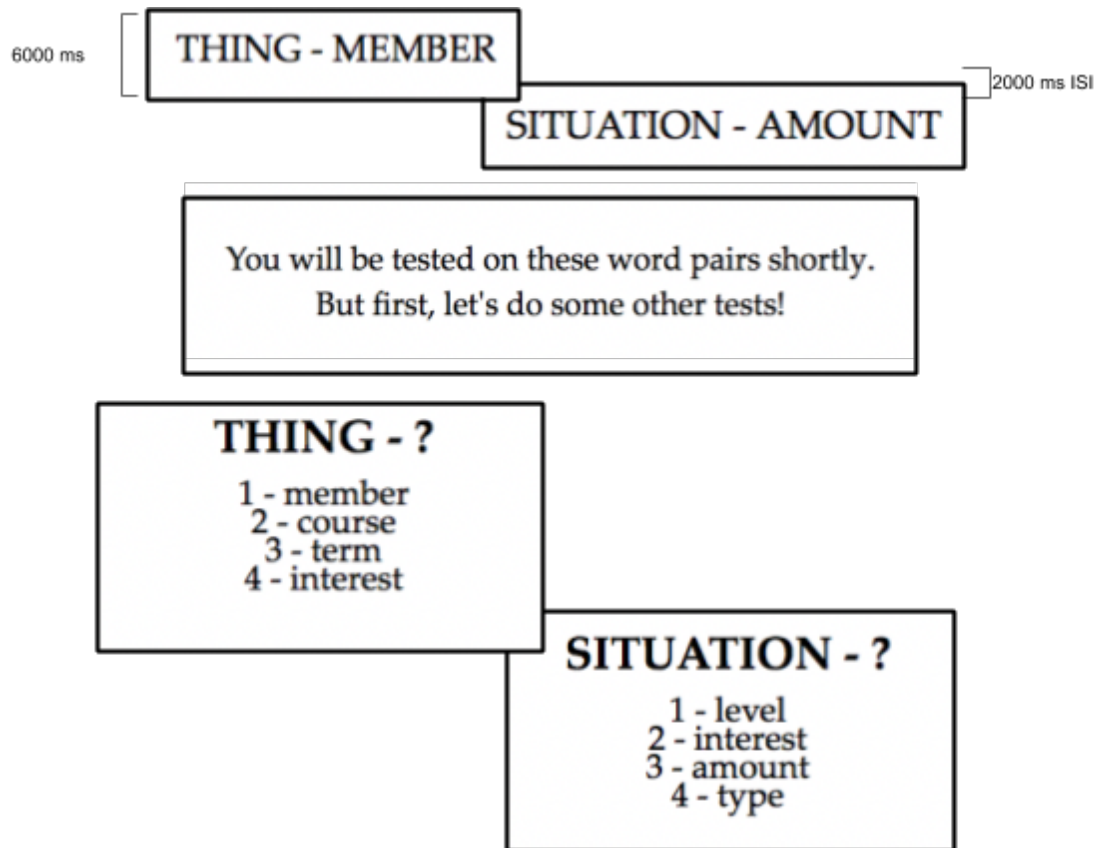
TMB Verbal Paired Associates Test

Constructs Measured: Cognition: Declarative Memory, Language

Duration: 2.4 minutes memorization, 2.4 minute test

Sample size for which normative data are available: 11,026

Description of procedure: Learn and memorize a set of 25 word pairs. A subset of distractors repeat to increase difficulty and requiring learning of word pairs.



This test assesses verbal memory and episodic memory and is adapted from standard paradigms for assessing context-specific encoding and verbal memory retrieval, as opposed to verbal recognition memory. Advantages of the task are that it is short and can be administered quickly and easily on a mobile device. The task is viewed as burdensome by participants.

Psychometric Characteristics

The Verbal Paired Associates test is scored based on the number of word pairs recalled correctly during the test phase out of 25. Scores on this test are highly reliable, with internal reliability of 0.87, based on a sample of N = 399. Alternate forms test-retest reliability is 0.6.

Sociodemographic effects were estimated from a sample of 1980 participants for whom demographic information was available. This participant group had a mean age of 27.7 and was 52.5% female. The distribution of scores is skewed toward lower scores, consistent with the difficulty of this version of the task (see Figure 1). Scores are relatively consistent across the lifespan, though there is a slight increase in performance throughout adolescence and a minor decline after age 60 (see Figure 2). On average, female participants scored higher than male participants (see Figure 3). Performance is correlated with education across all education levels (see Figure 4).

As expected, people who take this test on multiple occasions show practice effects; first-time participants had a mean score of 12.61, while repeat participants had a mean score of 14.82 (Cohen's $d = 0.42$). For this reason, any longitudinal study design should rely on alternate forms.

Validation

Performance on this test is modestly correlated with tests that rely on short-term memory such as forward digit span ($r = 0.23$, $n = 494$) and digit symbol matching ($r = 0.36$, $n = 517$). Performance on this test is also correlated with vocabulary performance ($r = 0.37$, $n = 521$). By contrast, the correlation is lower with tests of cognitive ability that do not involve significant challenges to memory or verbal ability, such as the GradCPT sustained attention test ($r = 0.066$, $n = 522$) and simple reaction time ($r = 0.17$, $n = 520$). It is also moderately correlated with Digit Symbol Coding ($r = 0.36$, $n = 517$), a test that measures cognitive processing speed, visual processing, and visual memory.

Appropriateness for Field Test Use

This task is easily adapted for field test use, but the length of the test may pose a barrier to completion. In order to control the time between learning and recall, this test should have another task interspersed between the learning phase and the test phase; this standardizes the conditions under which recall takes place, but may also increase participant burden.

Device Effects: The Verbal Paired Associates test can be administered across a wide variety of devices. Because this test is not scored based on reaction time or other time-dependent factors, differences between devices are unlikely to affect measured performance. Users of laptop or desktop computers score slightly higher than users of mobile devices (iPhone mean = 17.29, $SD = 5.90$, $N = 1702$; iPad mean = 17.63, $SD = 6.05$, $N = 575$; Macintosh laptop/desktop mean = 19.32, $SD = 5.42$, $N = 1526$). This is likely due to differences in demographic characteristics (such as age, sex, or education).

Participant Burden: The Verbal Paired Associates test is relatively well tolerated by participants, but the length of the test may be somewhat burdensome. Batteries hosted on TestMyBrain that contain a version of have an average rating of 3.8 out of 5, compared to a site-wide average of 3.7. Of the participants who reached the test portion of this task (after seeing all of the word pairs and completing an additional task between learning and recall), 97.1% completed it. However, only 43% of the participants who began the battery containing this test (which consisted of the learning phase, a distractor task to separate the two phases, and the recall phase) completed the entire battery. This suggests that the length of the three phases combined may pose a burden to participants.

Figure 1. Distribution of scores

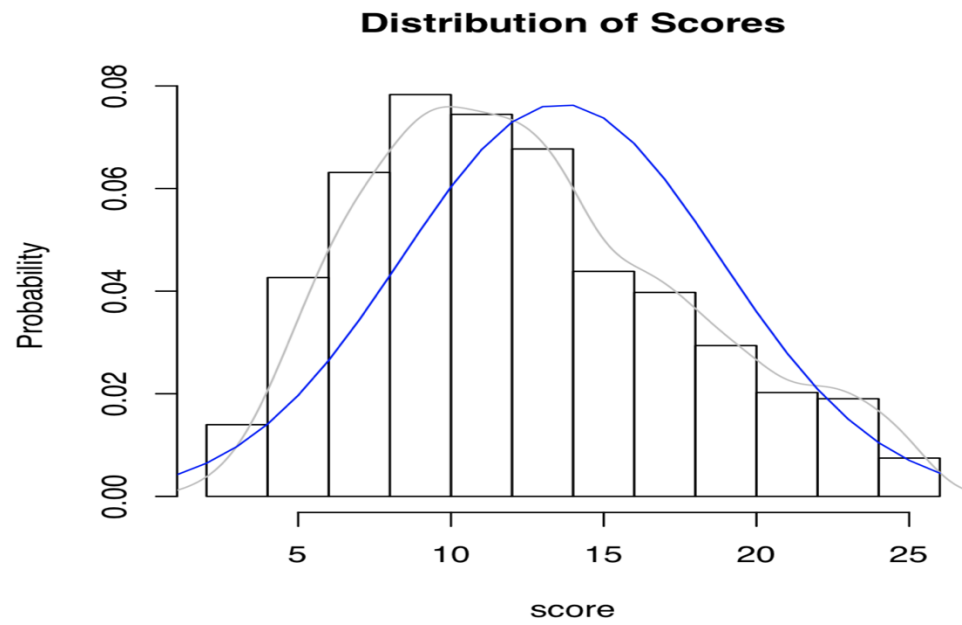


Figure 2. Age-related differences in performance

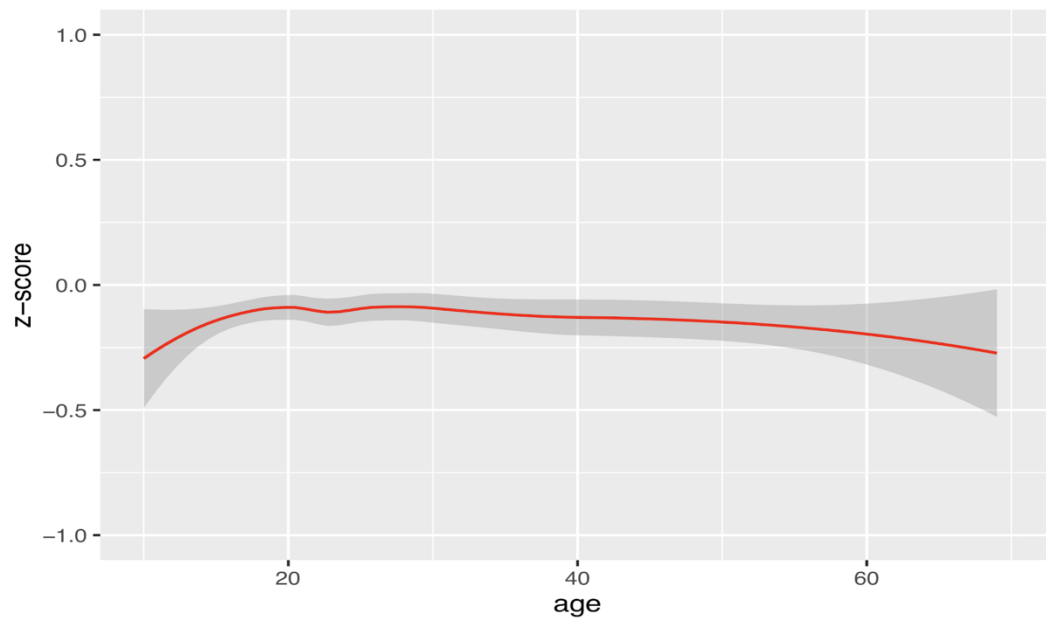


Figure 3. Sex differences in performance

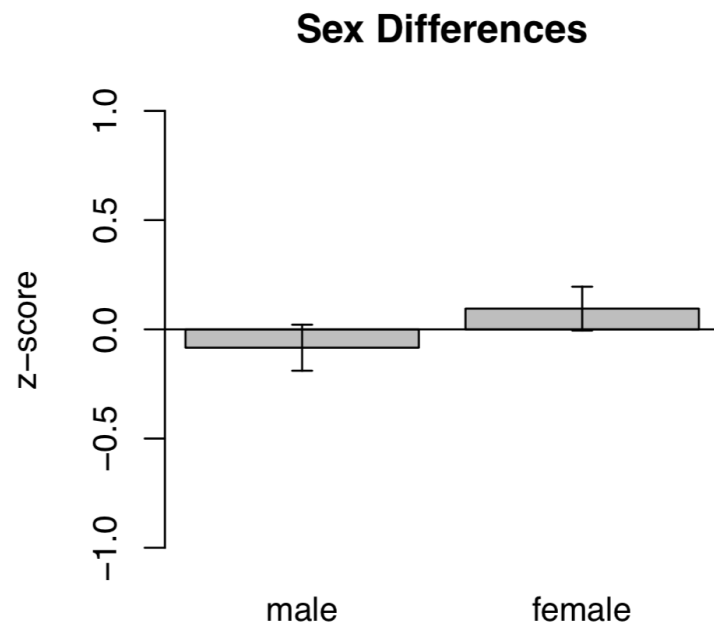


Figure 4. Education-related differences in performance

