

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 Visual Paired Associates Test

**Constructs Measured:** Declarative Memory, Visual episodic memory

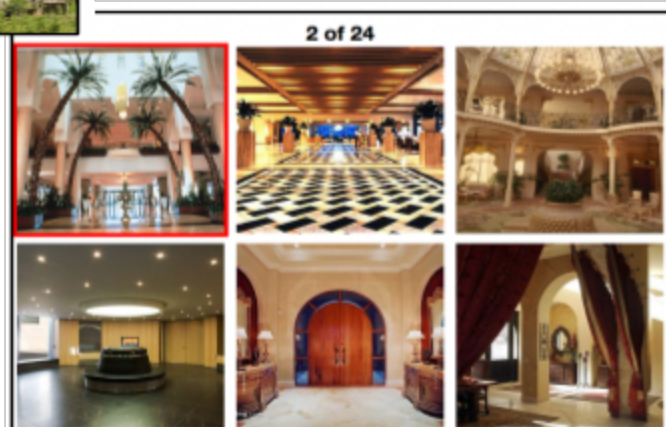
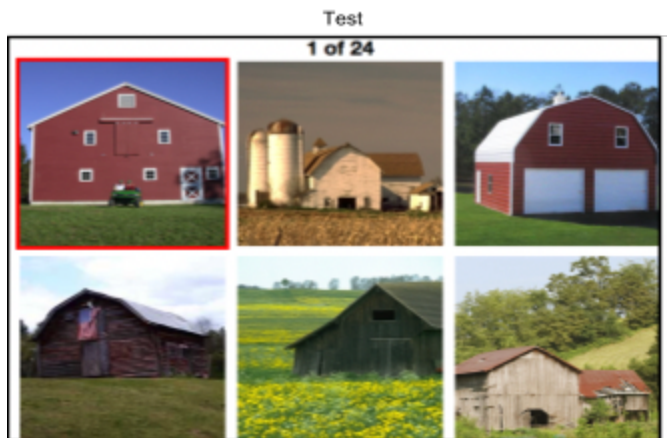
**Duration:** 2.4 minutes memorization, 2.4 minutes test

**Sample size for which normative data are available:** 6,380

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



You will be tested  
on these image pairs shortly.  
But first, let's do some other tests!



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

### **Psychometric Characteristics**

The main outcome measure for this test is accuracy, in terms of proportion correct or number correct out of 24 trials. There are other reaction time-based measures that could be derived from this test (e.g. mean response time), but since this is not a speeded test the interpretation of these measures would not be clear.

The Visual Paired Associates test shows high reliability; the internal reliability (split-half) was 0.79, calculated from the 6380 participants who completed this test on TestMyBrain. Sociodemographic effects were estimated based on scores for the 6014 participants for whom demographic data was available. This sample had a mean age of 34.11 and was 48.9% female. The distribution is normal, although with some ceiling effects (see Figure 1). Performance is relatively consistent across the lifespan, but scores do increase slightly throughout adolescence and decrease after age 50 (see Figure 2). Female participants have slightly higher mean scores than male participants (see Figure 3). Performance increases with education (see Figure 4).

Participants who take this test multiple times show slightly improved scores. First-time participants had a mean score of 15.74, while repeat participants had a mean score 16.48 (Cohen's  $d = 0.17$ ).

### **Validation**

This test shows moderate correlation with vocabulary ( $r = 0.30$ ,  $N = 1025$ , 95% CI [0.24, 0.35]), which also measures aspects of memory. It also correlates moderately with multiple object tracking, a test of visual perception and attention ( $r = 0.24$ ,  $N = 5288$ , 95% CI [0.23, 0.28]).

### **Appropriateness for Field Test Use**

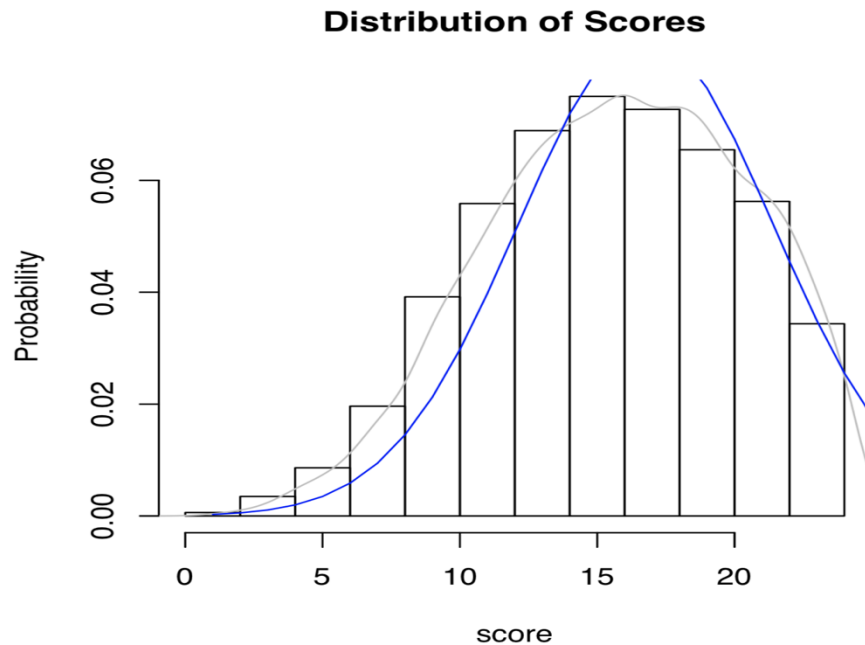
While this task is relatively simple, a practice round (in which participants choose the correct image with a prompt to guide them to it) is included to ensure that participants understand what is asked of them. Thus, difficulty understanding the task should not present a barrier to completion.

**Device Effects.** This test shows minor differences in performance between users of different devices; participants who took the test on a laptop or desktop computer had slightly higher scores than those who used mobile devices (iPhone mean = 15.18, SD = 4.30,  $N = 569$ ; iPad mean = 15.56, SD = 4.53,  $N = 412$ ; Macintosh laptop/desktop mean = 16.50, SD = 4.58,  $N = 1004$ ). Because this test does not use timed outcomes to measure performance, differences in device latency are unlikely to impact scores on this test, but differences in screen size may affect participants' ability to see the images presented. Based on the comparison of iPad and iPhone, however, these differences appear to be minimal.

**Participant Burden.** This test is considered engaging by those participants that complete it that is, ratings on the task are high, but attrition across batteries that include the test tend to have high attrition rates. The mean participant rating for batteries containing this test is 4 out of 5, compared to a sitewide average of 3.7. Of the participants who began the testing portion of this task, 98% completed it. However, only 56.2% of participants who began a battery containing this test completed the entire battery (which consists of a learning phase in which the

pictures are presented, an intermediate task to control the time between learning and recall, and the test phase). For comparison, the sitewide battery completion rate is 75%. This suggests that participants are stopping during the learning phase or between the learning and recall phases, but those who begin the recall phase almost always complete it.

*Figure 1. Distribution of scores*



*Figure 2. Age-related differences in performance*

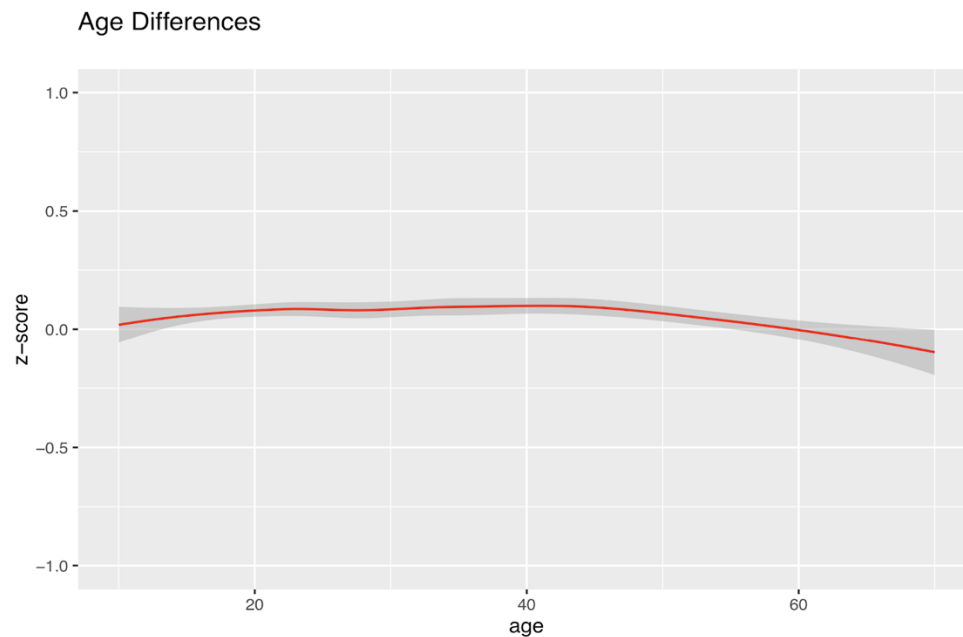


Figure 3. Sex differences in performance

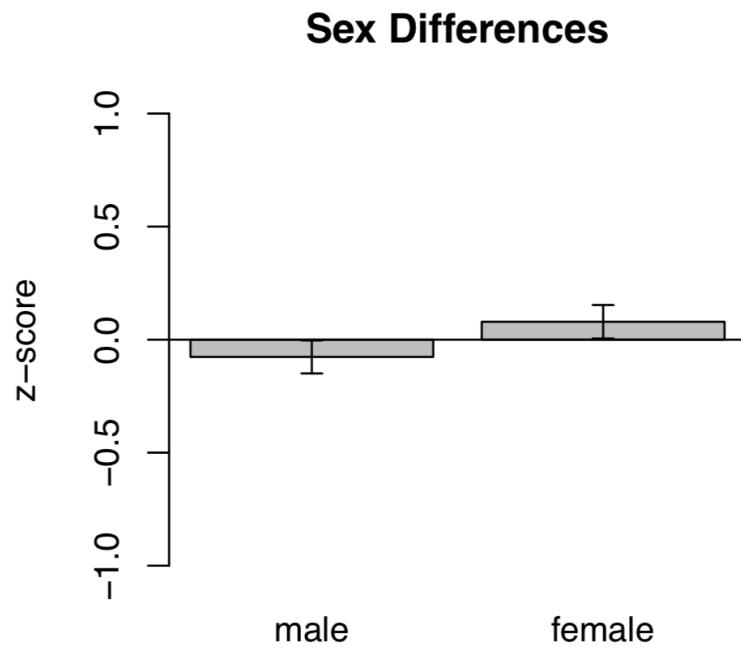


Figure 4. Education-related differences in performance

