

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.

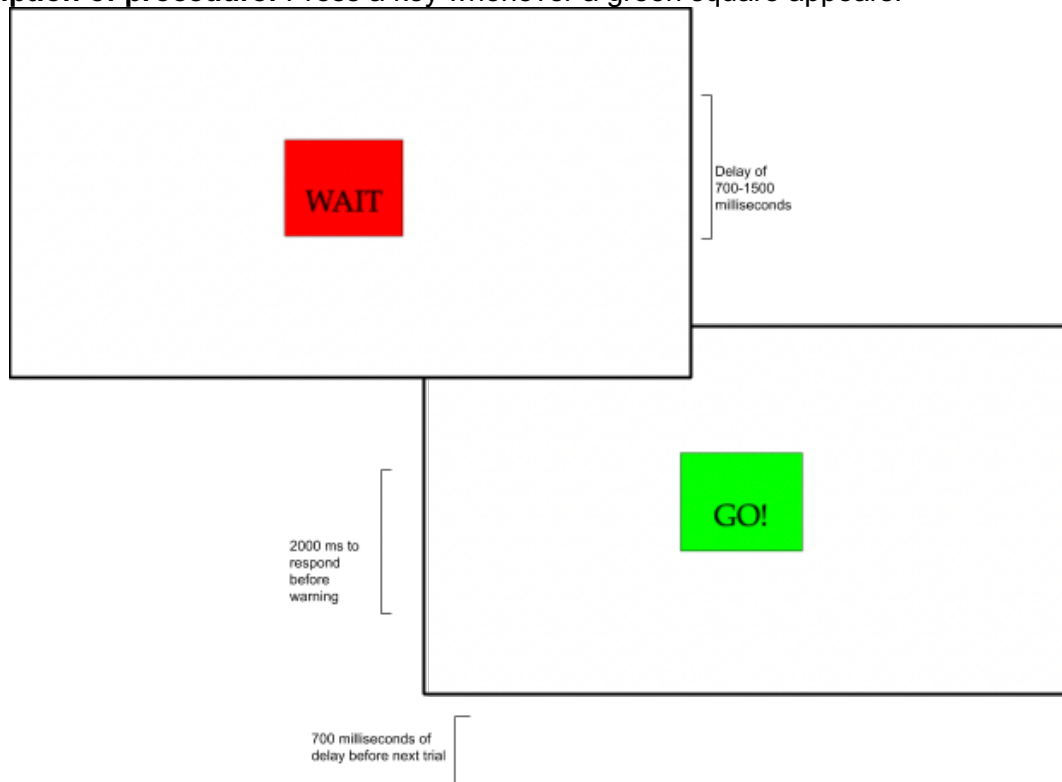
# TMB Simple Reaction Time

**Constructs Measured:** psychomotor speed, response speed

**Duration:** 1.7 minutes

**Sample size for which normative data are available:** 49,001

**Description of procedure:** Press a key whenever a green square appears.



This test is based a basic measure of simple reaction time, used to measure basic psychomotor speed where cognitive demands are minimized. Advantages of the task are that it is short, very sensitive, can be administered quickly and easily on a mobile device, and performance can be interpreted with respect to a large body of existing literature. Drawbacks are specific to a field test setting and include substantial device variance due to the interpretation of short and uncorrected response times. In combination with other tests (e.g. choice reaction time), however, this test can be used to better interpret cognitive performance on those tests.

## Psychometric Characteristics

The primary outcome measure returned by this test is the mean reaction time, which reflects a participant's ability to respond quickly to a stimulus. This outcome is measured in milliseconds. To create a more standardized measure to present to participants, the mean reaction time can also be transformed into a score ranging from 0 to 100 (calculated as  $10,000/\text{mean reaction time}$ ), such that higher scores indicate faster mean reaction times.

The Simple Reaction Time test has excellent reliability; internal reliability (split-half) is 0.93, as calculated from a 5000-person sample of the participants who have completed the test on TestMyBrain.

Sociodemographic effects were estimated based on the scores of 47,024 participants for whom demographic information was available. This participant group had a mean age of 29.85 and was 45.68% female. Scores are normally distributed, with a small group of outliers with scores near the maximum value, likely due to participants who pressed the response button repeatedly as fast as possible rather than waiting for the cue stimulus (see Figure 1). Performance is variable across the lifespan, with reaction times decreasing throughout adolescence before peaking at approximately age 20 and increasing throughout adulthood; this pattern is typical for reaction time-based tests (see Figure 2). Male participants show slightly faster reaction times on this test than female participants (see Figure 3). Effects of education on reaction time are minimal (see Figure 4).

Practice effects on this test are minimal. First-time participants have a mean reaction time of 316.05, while repeat participants have a mean score of 305.53.

**Device Effects:** Because the Simple Reaction Time test relies on measuring participant response times on a very brief scale, differences in device latency (the amount of time it takes for the device to register input) are likely to substantially affect scores. Among our participants on TestMyBrain, participants who used laptop or desktop had slightly faster reaction times than participants who used mobile devices (iPhone mean = 330.26, SD = 61.50, N = 5388; iPad mean = 345.23, SD = 70.90, N = 3152; Macintosh laptop/desktop mean = 298.22, SD = 57.81, N = 8175). Differences between laptop / desktop and tablet on this test are nearly a standard deviation in magnitude. Studies using this test must control for device type or use the same device type across participants.

**Participant Burden:** This task is well-tolerated by participants. The mean participant rating on TestMyBrain for batteries containing this test is 3.86 out of 5, compared to a sitewide mean rating of 3.7. 91.4% of participants who begin this test complete it.

Figure 1. Distribution of scores

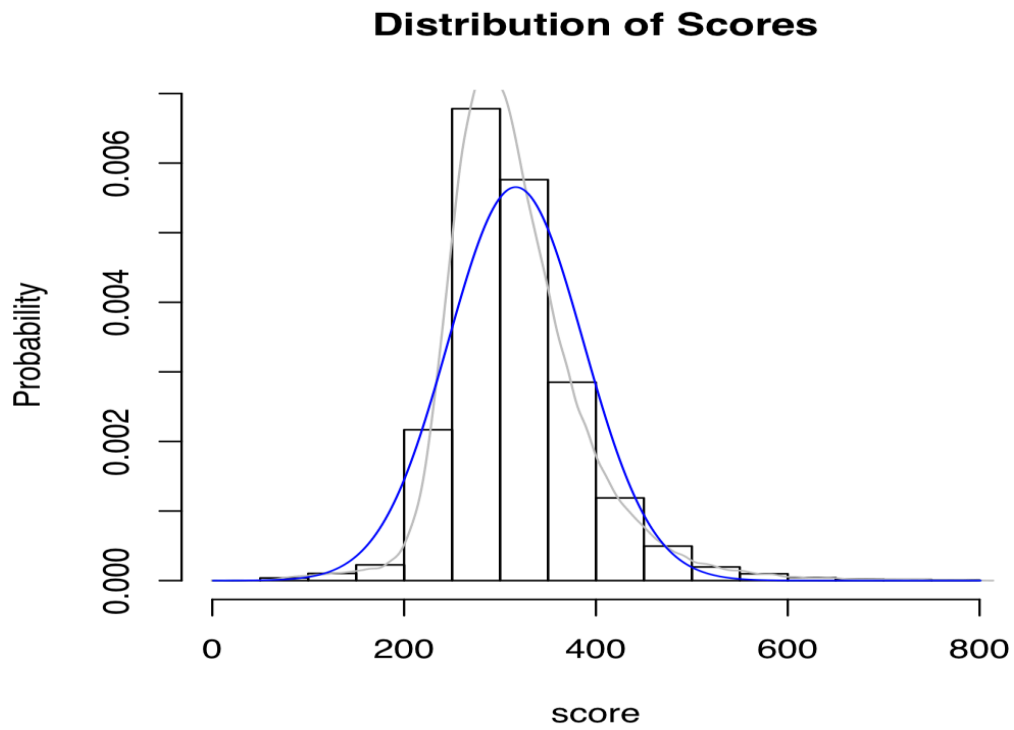


Figure 2. Age-related differences in performance  
Age Differences

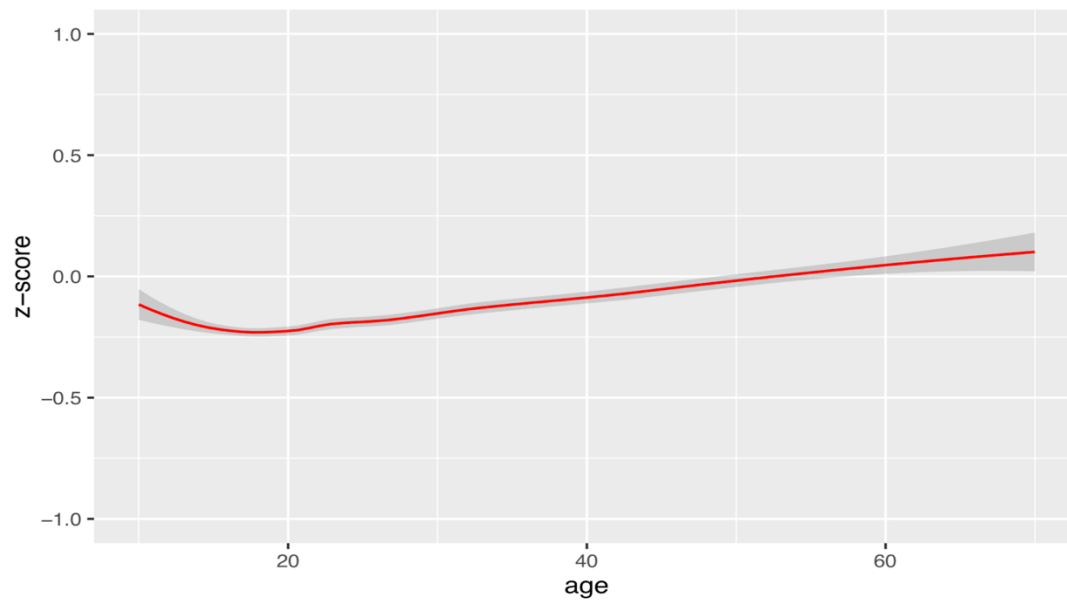


Figure 3. Sex differences in performance

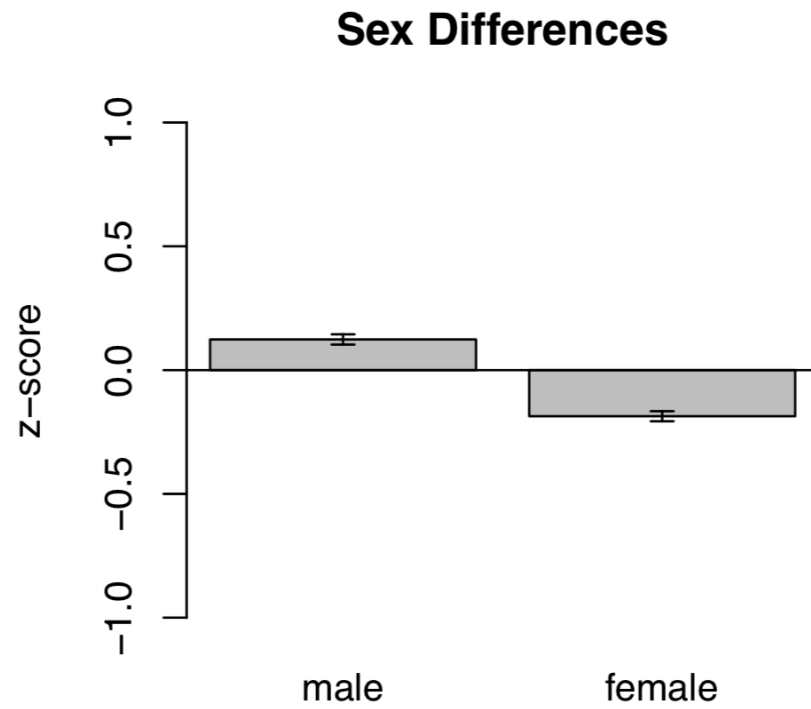


Figure 4. Education-related differences in performance

