Time Estimation Test

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Purpose of this document

This file contains all the information to understand and analyze Time Estimation Test. You will be able to find relevant information about how this assessment task works, what it measures, and all relevant data about the variables recorded during the performance of the activity.

Task Info

In this section information about the task, its structure, and stimuli will be given.

Task Description

The *Time Estimation Test* measures the ability to estimate the duration of a continuous auditory stimulus. The task has two stages and, in both stages, estimation is measured based on the ability to interrupt an ongoing auditory stimulus to then reproduce the exact length of time of a previously presented continuous auditory stimulus. In the first stage of the task, an animated drawing accompanies the auditory stimulus, thus providing visual support for the task of auditory estimation. During the second stage of the task, the drawing remains still, so that duration estimation proceeds based on auditory information only.

The more accurate the user is in stopping the stimulus with respect to the presented model, the higher the accuracy score will be. The difference between the duration of the model and the response time of the user is calculated to estimate the accuracy, with higher values representing better performance.

The concept of this task is based on the time estimation task used by Miltner et al. (1997).

You can try the *Time Estimation Test* for free on this page. If you want more information about its technical details, you can contact us at support@cognifit.com.

Cognitive skills measured

The primary cognitive ability measured by this task is ***time estimation***.

This task contributes to the measurement of Estimation and Auditory Perception.

Task Structure

Beyond the learning phase, the task is divided into two stages: one stage with both auditory and visual feedback, and one stage with only auditory feedback.

Phase	Stage	Amount of Trials	Sound	Target time	Description
Learning	0	1	Piano	1500	The items will warp as the music plays
Testing	1	4	Harp	1500	The items will warp as the music plays
			Bubbles	3000	
			Piano	2000	
			Harp	1500	
	2	4	Bubbles	1500	The items will remain still as the music plays
			Piano	3000	
			Harp	2000	
			Bubbles	1500	

Task Stimuli

A large white circle is presented. In the first stage, the circle begins to deform into a square, hexagon, or decagon shape at the same time that the sounds are played. In the second stage, the sounds are the same, but no visual clues are provided.

Variables Info

In this section details about the variables, their definition, range, and other pieces of relevant information will be given.

Basic Variables

Accuracy

This variable measures the percentage of accuracy in estimating the duration of an event (independent of the visual feedback). It ranges from 0 to 100, and higher values indicate better performance.

Accuracy in stage 1

This variable measures the percentage of accuracy in estimating the duration of an event during stage 1 (with supporting visual information). It ranges from 0 to 100, and higher values indicate better performance.

Accuracy in stage 2

This variable measures the percentage of accuracy in estimating the duration of an event during stage 2 (without supporting visual information). It ranges from 0 to 100, and higher values indicate better performance.

Effect of supporting visual information

This variable measures the difference in accuracy when estimating the duration of an event with and without supporting visual information. It ranges from -100 to 100.

Omission errors

This variable measures the number of trials where no response is given by the user, that is, the number of timeouts in the testing phase. It ranges from 0 to 8. High scores on this variable indicate that the user is distracted (not paying attention) or is too slow to answer.

Omission errors (percentage)

This variable measures the percentage of trials where no response is given by the user, that is, the percentage of timeouts in the testing phase. Its range can go from 0 to 100.

Additional Variables

Hearing impairment

This variable shows if the user indicated if he or she is hearing impaired in the general questionnaire. There are only two possible values for this variable: 1, meaning the user

indicated hearing impairment; and 2, meaning that the user indicated no hearing impairment.

Distance to target in Stage 1 Trial 1

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 1500, and values closer to 0 indicate better performance.

Distance to target in Stage 1 Trial 2

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 3000, and values closer to 0 indicate better performance.

Distance to target in Stage 1 Trial 3

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 2000, and values closer to 0 indicate better performance.

Distance to target in Stage 1 Trial 4

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 1500, and values closer to 0 indicate better performance.

Distance to target in Stage 2 Trial 1

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 1500, and values closer to 0 indicate better performance.

Distance to target in Stage 2 Trial 2

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 3000, and values closer to 0 indicate better performance.

Distance to target in Stage 2 Trial 3

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 2000, and values closer to 0 indicate better performance.

Distance to target in Stage 2 Trial 4

This variable measures the difference, in absolute millisecond values, between the actual item duration and the duration set by the user. It ranges from 0 to 1500, and values closer to 0 indicate better performance.

Validity Index

The user's performance will be considered to deviate from what is expected to the point of invalidating the results of the assessment when it falls outside these ranges.

Task validity

This variable represents the validity of the whole task, and it is 'true' only when all the individual variables of the Validity Index of the task are 'true'. Otherwise, it is 'false'.

Accuracy in Stage 1 validity

This variable measures the validity of the variable "Accuracy in stage 1", and it is 'true' when its value is between 0 and 100 (both included). Otherwise, it is 'false'.

Accuracy in Stage 2 validity

This variable measures the validity of the variable "Accuracy in stage 2", and it is 'true' when its value is between 0 and 100 (both included). Otherwise, it is 'false'.

Omission errors validity

This variable measures the validity of the variable "Omission errors", and it is 'true' when its value is 4 or below. Otherwise, it is 'false'

References

Miltner, W. H. R., Braun, C. H., & Coles, M. G. H. (1997). Event-Related Brain Potentials Following Incorrect Feedback in a Time-Estimation Task: Evidence for a "Generic" Neural System for Error Detection. *Journal of Cognitive Neuroscience*, 9(6), 788-798. https://doi.org/10.1162/jocn.1997.9.6.788