Stop-Signal Test

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Purpose of this document

This file contains all the information to understand and analyze the Stop-Signal 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

In the *Stop-Signal Test*, participants are presented with a series of trials where they are asked to perform a specific action to generate a highly automatic response tendency. In this instance, two circles are displayed, and in each trial, one of them will turn yellow. The participants are then tasked to click on the yellow circle as quickly as possible to establish a response tendency. Following these trials, a stop signal, characterized by the circle turning from yellow to red, is introduced, asking the participants to withhold their response, thus implying an inhibition of the established behavior. This stop signal may appear at variable times after the stimulus requiring a response is presented. Participants should refrain from pressing the illuminated circle when it turns red.

The concept of this task is based on the Stop-Signal Paradigm (Logan & Cowan, 1984).

You can try the *Stop-Signal 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 **Inhibition**.

Task Structure

The task is divided into 2 phases:

Phase	Stage	Amount of trials	Correct Answers		GO Trials	NO-GO trials	Time allowed to answer
			"Left"	"Right"			
0 *(Learning)*	*1*	6	3	3	6	0	1000 ms
1 *(Testing)*	*1*	24	12	12	24	0	1000 ms
	2	36	12	12	24	12	1000 ms

Task Stimuli

Two gray circles are displayed centered on the screen. In each trial, one of them will light up in yellow: either the one on the left or the one on the right. The other one will remain gray.

In the second phase of this task, the same circle that turned yellow can also become red later, indicating that the response should be stopped. This stop signal will appear in 12 out of the 36 trials:

- 4 times after 100ms
- 4 times after 200ms
- 4 times after 300ms

These delays in the appearance of the stop signal are applied randomly in each one of the No-Go trials.

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 all trials of the testing phase. It ranges from 0 to 100, and higher values indicate better performance.

Accuracy in stage 1

This variable measures the percentage of accuracy in all trials from the stage 1 of the testing phase. It ranges from 0 to 100, and higher values indicate better performance.

Accuracy in stage 2

This variable measures the percentage of accuracy in all trials from the stage 2 of the testing phase. It ranges from 0 to 100, and higher values indicate better performance.

Response time

This variable measures the average response time to correct trials in the testing phase. It ranges from 0 to 1000 milliseconds, and lower values indicate better performance.

Response time in stage 1

This variable measures the average response time to correct trials from the stage 1 of the testing phase. It ranges from 0 to 1000 milliseconds, and lower values indicate better performance.

Response time in stage 2

This variable measures the average response time to correct trials from the stage 2 of the testing phase. It ranges from 0 to 1000 milliseconds, and lower values indicate better performance.

Omission errors (percentage)

This variable measures the percentage of times the user didn't press the circle after 1000ms when they should, that is, when it was always yellow. It ranges from 0 to 100, and high scores on this variable indicate that the user is distracted (not paying attention) or has a slow response.

Commission errors (percentage)

This variable measures the number of times the user pressed the circle after 1000ms when they shouldn't, that is, when it turned red. It ranges from 0 to 100, and lower values indicate better performance.

Additional Variables

Additional variables refer to the variables and indices that are calculated by CogniFit for its internal computation of results.

Accuracy in GO trials

This variable measures the percentage of accuracy in trials where the circle should be pressed, that is, when it was always yellow. It ranges from 0 to 100, and higher values indicate better performance.

Accuracy in NO-GO trials

This variable measures the percentage of accuracy in trials where the circle shouldn't be pressed, that is, when it turned red. It ranges from 0 to 100, and higher values indicate better performance.

Omission errors

This variable measures the number of times the user didn't press the circle after 1000ms when they should, that is, when it was always yellow. It ranges from 0 to 48, and high scores on this variable indicate that the user is distracted (not paying attention) or has a slow response.

Commission errors

This variable measures the number of times the user pressed the circle after 1000ms when they shouldn't, that is, when it turned red. It ranges from 0 to 12, and lower values 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 validity

This variable measures the validity of the variable “Accuracy”, and it is ‘true’ when its value is between 0 and 100, both included. Otherwise, it is ‘false’.

Response time validity

This variable measures the validity of the variable “Response time”, and it is ‘true’ when its value is between 100 and 1000, 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 below 24, included. Otherwise, it is ‘false’.

References

Logan, G. D., & Cowan, W. (1984). On the ability to inhibit thought and action: A theory of an act of control. *Psychological Review*, *91*(3), 295-327. https://doi.org/10.1037/0033-295x.91.3.295