



Digit Span Test

Version No: 2022.1
Issue Date: 2022-11-28

Purpose of this document

This file contains all the information to understand and analyze Digit Span 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 *Digit Span Test* measures the direct phonological memory span. The test-taker is required to learn and immediately reproduce an increasingly larger amount of numbers shown on the screen. The smallest sequence of numbers is made of two numbers, and the longest sequence will have ten numbers. After each correctly reproduced sequence of numbers, the following sequence will be incremented by one number. If the participant makes a mistake in the sequence, a new sequence of the same length will be shown. If he/she gets the second attempt right, the next sequence will add one more number, and if he/she fails, the task will be terminated.

The concept of this task is based on the direct digit span task (Miller, 1956), which is also used as a subtest in the Wechsler assessment battery (WAIS-III; Wechsler, 1997).

You can try *Digit Span 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 abilities measured by this task are **phonological short-term memory and memory span**.

This task contributes to the measurement of Phonological short-term memory, Short-term memory, Working memory, Response time, and Processing speed.

Task Structure

The task consists of a maximum of 9 stages. Each stage will be divided into two turns: (1) the computer's turn, during which a sequence 2 to 10 single digits will be displayed, and (2) the user's turn, during which the user will have to repeat the displayed sequence.

If the user misses a single number in the sequence, it will be considered an error. If the user fails once in a given stage, a different trial with a sequence of the same length will be presented. If the user fails a second time, the task will be terminated. Each time a user repeats a complete sequence correctly, he/she advances to the next stage. After completing the ninth stage, the task is completed.

Stage	Amount of digits to remember	Maximum total digits presented (attempts 1 + 2)
1	2	4
2	3	6
3	4	8
4	5	10
5	6	12
6	7	14
7	8	16
8	9	18
9	10	20
Total	54	108

Task Stimuli

There is a big circle in the center and 10 static circles around during the user's turn. They are clearly differentiated from the background. The circles' colors are white (standby), or orange (when lighted up or when correctly clicked). When correctly repeating a series, there is a green tick in the central circle. If there is a mistake, a red cross will appear.

Variables Info

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

Basic Variables

Basic variables refer to variables and indices that are commonly used in experimental research and clinical settings.

Memory span

This variable represents the longest sequence the user remembered correctly in the task. It measures the sequence length (namely, the amount of digits remembered). Its range can go from 0 to 10, and higher 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.

Response time

This variable measures the average response time (in milliseconds) to all the individual responded items in the correct series. Its value should be greater than 0 and lower than 10000, and lower values indicate better performance.

Omission errors

This variable measures the number of items where no response is given by the user, that is, the number of timeouts. Its range can go from 0 to 64.

Average number of trials in correct series

This variable measures, as an average, the number of trials the user needed to correctly perform each stage or series. Its range can go from 1 to 2, and values closer to 1 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'.

Memory span validity

This variable measures the validity of the variable "Memory span", and it is 'true' when its value is between 0 and 10. 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 250 and 10000 (both included). Otherwise, it is 'false'.

References

Miller G. A. (1956). The magical number seven plus or minus two: some limits on our capacity for processing information. *Psychological review*, 63(2), 81–97.

Wechsler, D. (1997). WAIS-III: Wechsler Adult Intelligence Scale - Third edition administration and scoring manual. San Antonio, TX: Psychological Corporation.