



# Eye-Hand Coordination Test (Multidirectional and Unpredictable Direction)

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## Purpose of this document

This file contains all the information to understand and analyze Eye-Hand Coordination Test (Multidirectional and Unpredictable Direction). 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.

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# Task Info

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

## Task Description

The *Eye-Hand Coordination Test (Multidirectional and Unpredictable Direction)* measures the ability to perform an accurate manual, continuing motor movement action based on the processing of visual information. The test-taker is required to track a ball moving in an unknown but determined itinerary. The distance in pixels between the center of the ball and the cursor moved by the user will be considered to calculate an accuracy score.

The concept of this task is based on the Vienna Test System (VTS; Whiteside, 2002) and the Trail-Making Test (Reitan, 1955).

You can try the *Eye-Hand Coordination Test (Multidirectional and Unpredictable Direction)* for free on [this page](#). If you want more information about its technical details, you can contact us at [support@cognifit.com](mailto:support@cognifit.com).

## Cognitive skills measured

The primary cognitive ability measured by this task is **hand-eye coordination**.

This task contributes to the measurement of Hand-Eye Coordination, Shifting, Updating, and Processing Speed.

## Task Structure

Phase	Segments	Duration	Speed
0 (Learning)	1	7000	Slow
	2	7000	Fast
1 (Testing)	1	7000	Slow
	2	7000	Fast
	3	2333	Slow
	4	2333	Fast
	5	7000	Slow
	6	7000	Fast
	7	2333	Slow
	8	2333	Fast
	9	7000	Slow
	10	7000	Fast
	11	2333	Slow
	12	2333	Fast

## Task Stimuli

There is only one item, which will be slowly moving around the screen as soon as the user hovers the mouse over it for the first time. It is clearly differentiated from the background. The item consists of a small circle that changes its color depending on the relative position of the mouse:

- If the cursor is within the first half of the circle's radius from the center, the circle will be white, with a green tick in the center.
- If the cursor is within the rest of the circle, from halfway of the radius to the edge of the circle will be orange.
- If the cursor is outside of the circle, the circle will be red, with a white cross (X) in the center.

However, in the beginning, the circle will remain orange and still, until the user hovers the cursor over the first half of the circle's radius from the center for the first time (then it will start moving around the screen). The cursor is presented as four thin white lines in the north, south, east, and west position, with a point marking the center of the cursor.

# 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 accuracy as the percentage of time that the cursor was inside the circle. It ranges from 0 to 100 and higher values indicate better performance.

### Accuracy in fast speed

This variable measures the accuracy as the percentage of time that the cursor was inside the circle when the speed of the ball is fast. It ranges from 0 to 100 and higher values indicate better performance.

### Accuracy in slow speed

This variable measures the accuracy as the percentage of time that the cursor was inside the circle when the speed of the ball is slow. It ranges from 0 to 100 and higher values indicate better performance.

## Additional Variables

### Accuracy in long segments duration

This variable measures the accuracy as the percentage of time that the mouse cursor was inside the circle in segments with a duration of 7000 milliseconds. It ranges from 0 to 100 and higher values indicate better performance.

### Accuracy in short segments duration

This variable measures the accuracy as the percentage of time that the mouse cursor was inside the circle in segments with a duration of 2333 milliseconds. It ranges from 0 to 100 and higher values indicate better performance.

### Distance from the circle center

This variable measures the average distance of pixels between the mouse cursor and the center of the circle across time. It ranges from 0 to 1200 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'.

## Completion time validity

This variable measures the validity of the variable "Completion time", and it is 'true' when its value is between 54000 and 58000 (both included). Otherwise, it is 'false'.

# References

Reitan, R. M. (1955). The relation of the trail making test to organic brain damage. *Journal of Consulting Psychology*.

Whiteside A. (2002) A synopsis of the Vienna Test System: A computer aided psychological diagnosis. *JOPED*, 5 (1), 41–50.