Manual Dexterity Test

University of Jordan

Lab Human

2024

Table Index

Team

- Alaa Saqr 0201373
- Saleem BOURI 0202428
- Bara Edris 0206169
- Yazan Othman 0195843
- Nour eddin zwayed 0199286

❖ Objectives:

The objectives of the Manual Dexterity Test, specifically the Placing Test and the Turning Test, in a human factor's lab are:

1. Evaluate Fine Motor Skills: To assess an individual's ability to perform tasks requiring precise hand movements and coordination.

2. Measure Hand-Eye Coordination: To determine the efficiency with which a person can coordinate visual input with hand movements.

3. Assess Speed and Accuracy: To quantify the speed and accuracy of an individual's hand movements while performing specific tasks.

4. Identify Individual Differences: To recognize variations in manual dexterity among different individuals, which can inform decisions about job placement or task assignments.

5. Test the Impact of Ergonomic Interventions: To evaluate how changes in tools, workstations, or methods affect manual dexterity and overall task performance.

6. Support Rehabilitation Programs: To monitor the progress of individuals recovering from hand injuries or surgeries and to tailor rehabilitation programs based on objective measures of dexterity.

7. Contribute to Ergonomic Research: To provide data for studies on human performance and ergonomics, helping to design more effective tools and work environments.

❖ Background:

This test is used to measure a subject's simple but rapid hand-eye co-ordination as well as arm-hand dexterity. It generally measures gross motor skills. This test by many physical and occupational therapists to document patient progress and/or their degree of disability.

❖ Equipment:

For this test we'll need:

- MMDT instruction manual
- MMDT test board
- 60 plastic disks
- Score sheet
- A table and a stopwatch

❖ Tables:

Placing Test

male	practice	trial 1	trial 2	trial 3	average
1	74	57	62	60	63.25
2	64	62	61	56	60.75
3	66	63	62	68	64.75
4	56	53	57	50	54
5	62	68	70	64	66

Column1	
Mean	61.75
Standard Error	2.125735
Median	63.25
Mode	#N/A
Standard Deviation	4.753288
Sample Variance	22.59375
Kurtosis	1.845733
Skewness	-1.39417
Range	12
Minimum	54
Maximum	66
Sum	308.75
Count	5
Confidence Level(95%)	5.901987

2-Hand Turning

male	practice	trial 1	trial 2	trial 3	average
1	60	49	55	54	54.5
2	54	46	49	46	48.75
3	63	60	64	59	61.5
4	44	40	37	40	40.25
5	46	49	42	39	44

Column1	
Mean	49.8
Standard Error	3.77442
Median	48.75
Mode	#N/A
Standard Deviation	8.439861
Sample Variance	71.23125
Kurtosis	-0.93501
Skewness	0.442311
Range	21.25
Minimum	40.25
Maximum	61.5
Sum	249
Count	5
Confidence Level(95%)	10.47947

❖ Procedure:

Placing Test:

1. Initial Position. Position the board roughly ten inches away from the edge of the table. Place the disks within the board's holes. Raise the board so that the disks fall through the openings and stay in neat rows and columns on the surface.
2. Position the board so that it faces the disks directly.
3. You must start with the hand that you use the most. Select the lower disk and place it into the upper opening of the board. The next disk in the column to the right must now be picked up, and so on. During this test, you will go from right to left. After finishing a column, go back and repeat the preceding order in the until the entire board is filled, continue in the second column.
4. Before the trial is over, you have to make sure that every disk is completely placed into the board's holes. Before the timer stops, you must retrieve any dropped disk and place it in the appropriate hole. The total amount of seconds needed to finish multiple trials will be your score. We intend to Note the time spent on each trial independently. Before beginning a new trial, you have to reposition the disks and board in their initial positions after completing the previous one.

Turning Test:

1. Beginning Position: Position the board one inch away from the edge of the topic on the table. With either the RED or BLACK side facing up, place each disk into the holes on the board (the color must be the same throughout the entire board).
2. Take the block from the upper right corner with your LEFT hand. With the BOTTOM side facing up, turn the disk while holding it in your RIGHT hand and place it back in the board's original hole. In the top row, you have to work across the board to your LEFT.
3. Until you have finished the TOP row, keep demonstrating. Pick up the first block in the second row using your RIGHT hand as you begin to demonstrate the second row. Turn the disk as you transfer it to your LEFT hand, then put the bottom side back into the original hole. pointing upward. Up till you finish the entire row, you will work to your RIGHT.
4. The subject consistently uses the leading hand to pick up the blocks and the following hand to lay them down. Proceed to walk through the entire test. Using your left hand to pick up the disk and your right hand to hold it, you will move back to the left in the third row. Place it back in the original opening. You have to pick up the disk with your RIGHT hand and put it back with your LEFT hand while moving back to your RIGHT on the fourth row.

❖ Sources of Error

A popular evaluation tool for people six years of age and older is the Minnesota Manual Dexterity Test, which gauges manual dexterity. Similar to any psychometric test, it's critical to be aware of potential error sources that could compromise the test's validity and reliability. These are a few Potential sources of inaccuracy for the Minnesota Manual Dexterity Exam include:

Variability in Motor Skill:

Variations in motor skills across individuals may impact their success on tests. Variability in performance can be caused by factors like age, hand dominance, and past experience with similar activities.

Testing Context:

Performance might be affected by distractions, discomfort, or poor lighting in the testing area. In order to reduce outside influences, a testing area that is peaceful and comfortable is necessary.

Fatigue and Motivation:

During the evaluation, test-takers may feel fatigued, especially if the test is long. Manual dexterity can be impacted by fatigue, which can result in diminished performance. Furthermore, motivation levels might influence work and task engagement.

Effects of Practice:

There might be a practice effect that affects how well people perform if they have previously encountered activities requiring equivalent physical dexterity. This may not fairly represent the person's actual dexterity and can artificially inflate scores.

❖ Conclusion:

The Placing exam evaluates a person's ability to move particular objects across various distances, and the Turning test measures dexterity and hand-eye coordination. Based on the findings, the experiment's duration reduces as the study's number of trials rises. This The increased hand-arm coordination is credited with the time decrease, suggesting a higher level of familiarity with the trial process.