University Of Jordan

School Of Engineering

Industrial Engineering Department

HUMAN FACTOR & WORK MEASUREMENT LAB

Experiment #5:

Manual Dexterity Test

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- **introduction:**

A manual dexterity test evaluates an individual's ability to perform tasks that require precise hand movements, coordination, and fine motor skills. These tests are commonly used across various industries, such as healthcare and manufacturing, to assess an individual's aptitude for activities that demand meticulous hand-eye coordination. The assessment typically includes tasks like manipulating small objects, assembling components, and demonstrating control in various hand movements.

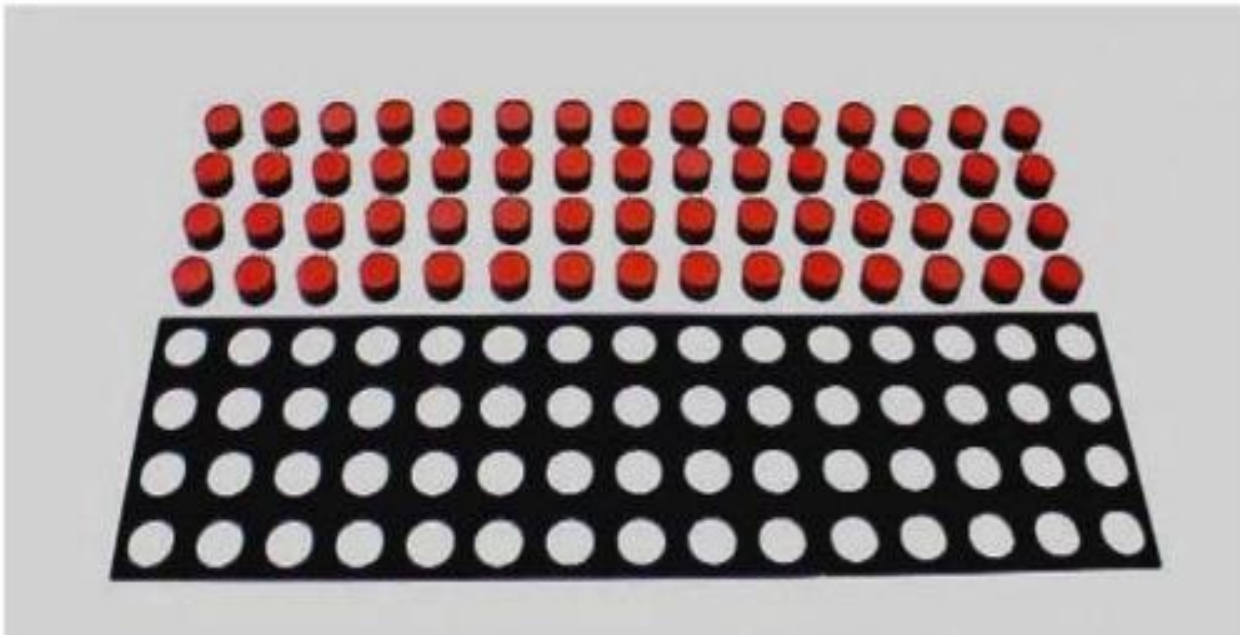

Figure 1 : Minnesota Manual Dexterity Test
"test board"

- Procedure:

Magill considers three systems, in which motor skill classification is based:

1. The precision of the movement
2. Defining the beginning and end points of the movement
3. The stability of the environment

- Placing Test
    1. Starting Position. Put the board on the table about 10 inches from the edge. Insert the disks into the holes in the board. Lift the board UP, allowing the disks to fall through the holes and remain in straight rows and columns on the table. Now place the board directly in front of the disks. Note: If the disks moved out of place, manually realign the disks. The board should now be about 1 inch from the edge of the table closest to the subject. This is the starting position for the placing test.Figure 2 illustrates this position.

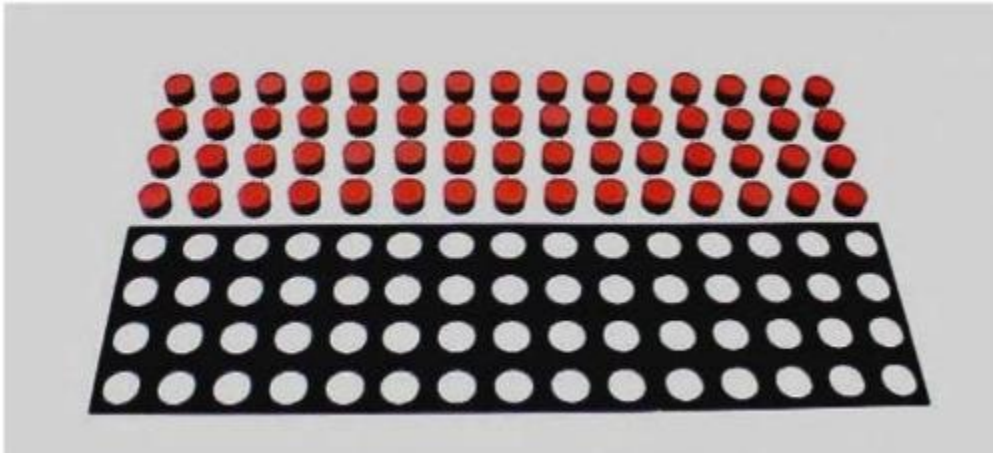

Figure 2 : Starting position for the Placing Test.

2. The object of this test is to see how fast you can put the disks into the holes of the board using only one hand. You will want to use your dominant hand.

3. You must begin on your RIGHT. Pick up the bottom disk and insert it into the top hole of the board. Now, you must pick up the next disk in the column on the right, and so on. You will move from right to left on this test. Once you complete one column, repeat the previous sequence in the second column until you have filled the entire board.

4. You must make sure that all of the disks are fully inserted into the holes of the board before the trial is complete. If you dropped a disk, you must pick it up and insert it into the proper hole before the time is stopped. Your score will be the total number of seconds it takes to complete several trials. We will record the time for each trial separately. When you finish one trial, we must rearrange the board and disks into a starting position before starting another trial

- Turning Test

    1. Starting Position: Put the board on the table about 1 inch from the edge closest to the subject. Insert all of the disks into the holes in the board with either the RED or BLACK side facing UP (the color must be consistent on the whole board). You should now be in the starting position for the Turning Test, which is illustrated below in Figure 3

Figure 3 : Starting position for the Placing Test.

2. The object of this test is to see how fast you can pick up the disks with one hand, turn them with the other hand, and replace the disks back into the holes on the board.

3. With your LEFT hand, pick up the block from the upper right-hand corner. Turn the disk while passing it to your RIGHT hand and return it into the original hole in the board with the BOTTOM side facing UP. You must work to your LEFT across the board on the top row.

4. Continue to demonstrate until you complete the entire TOP row. As you start to demonstrate the second row, now with your RIGHT hand, pick up the first block in the second row. Turn the disk while passing it to your LEFT hand and return it into the original hole with the BOTTOM side facing UP. You will work to your RIGHT until you complete the entire row.

5. The subject always picks UP the blocks with the hand that LEADS and put them DOWN with the hand that FOLLOWS. Continue demonstrating the test in its entirety. As you work back to the LEFT in the third row, you will use your LEFT hand to pick up the disk and your RIGHT hand to return it back to the original hole. Working back to your RIGHT on the fourth row, you must use your RIGHT hand to pick up the disk and your LEFT hand to return it."

- Calculations:

Table1: reading, average, total and standard deviation.

name	name test	trail 1	trial 2	trial 3	trial 4	total	mean	std
ghanem	placing	75	76	70	65	286	71.5	4.387482
	turning	82	81	80	65	308	77	6.964194
sanad Bustami	placing	61	67	62	70	260	65	3.674235
	turning	80	68	70	62	280	70	6.480741

Table2: tables demonstrate your reading and expected percentile.

Placing Test

	Percentile Rank	Seconds for Three Trials	Standard Score
Very High	100		
	90	138	6.28
High	80	144	5.84
	70	148	5.53
Average	60	152	5.25
	50	155	5.00
	40	159	4.75
Low	30	162	4.47
	20	167	4.16
Very Low	10	174	3.72
	0		

Turning Test

	Percentile Rank	Seconds for Three Trials	Standard Score
Very High	100		
	90	109	6.28
High	80	114	5.84
	70	118	5.53
Average	60	121	5.25
	50	124	5.00
	40	127	4.75
Low	30	131	4.47
	20	135	4.16
Very Low	10	142	3.72
	0		

- Unfortunately, we were both within last 0-10 % which mean we have less neuromuscular compatibility.

- Discussion

Determining the "best" method in work can vary depending on the context, industry, and individual preferences. However, some general principles and methods can contribute to effective and efficient work The importance of employing the best methods in working is significant and can have a positive impact on both individual and organizational levels.