Experiment # (7-A): Aiming

Objectives:
 Measure the aspects of Aiming, eye-hand coordination.

Definition:
Aiming is the ability to move one's hand to a precise stationary position. It differs from arm-hand steadiness in that aiming requires the person to move the hand to a particular position, rather than just holding it stationary. These abilities are highly related to precision working; it is most easily seen in dentistry where the dentist moves the drill to the precise, appropriate position on the affected tooth.

Steadiness Tester - Hole Type:

The steadiness tester has a fascination for many people. It measures both small-motor coordination and steadiness of the hand. Many variables affect both, and the steadiness tester can be used as one measure of stress, preparedness, and perhaps fitness.

The subject is asked to place the stylus in each hole, starting with the largest. The counter can be attached to the stylus to automatically count the number of touches. And record the total amount of time for the task.

A standard instructions concerning the depth of placement, the amount of time the stylus is to be held in the hole, and the placement of the hands and arms. Some subjects might discover that holding the stylus hand with their other hand greatly increases their skill level!

Steadiness Tester - Slot Type:

The slot type tester tests both small-motor coordination and steadiness, but also looks at the ability to move the arm in a **straight line**. As a diagnostic tool for an industrial psychologist, it would apply to tasks requiring motion as well as placement.

The subject is asked to start moving the stylus from the wider end to the narrower end. The counter can be attached to the stylus to automatically count the number of touches (errors). In addition, you can record the total amount of time for the task, the distance at which the first error was made, or improvement across trials.

An audio feedback (tune response) is provided for the subjects on both the slot type and the Hole type steadiness testers. This feedback may either improve or detract from performance.

Note:

On this task, it is better if the subject does not rest their arm on the table. If they keep their arm in the same place, their hand will describe an arc and it will harm their performance. If they move their arm along the table, this could act as a guide for their hand and their performance would be improved. Be careful to place the equipment parallel to the subject and at the same distance from their elbow/shoulder. The distance will vary depending on the height of the subject.

Apparatus:

Hole plate is a manipulative dexterity test .The subject's task is to hold a metal-tipped stylus in 9 progressively smaller hole sizes stationary without touching the sides, see Figure 7.
Hole diameters: 1.156, 1.125, .5, .312, .25,.187,.109,.093,.078 inches.
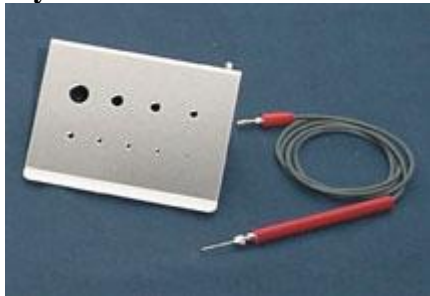**Stylus diameter: .0625**

Figure 1: Hole plate   Figure2: slot type grooved steadiness tester

Experiment procedure:

1. The person stands at a comfortable distance from the hole-plate holding the stylus in the dominant hand as holding a pencil.
2. Reset the counter and stopwatch to zero.
3. Flip the toggle switch to the start position.
4. Start the stopwatch at the same time.
5. The subject will insert rapidly the stylus in each of the specified 9 holes starting with the largest without touching the edges.
-Each time the stylus touches an edge, it will be registered as an error or contact on the impulse counter. In addition, you can record the total amount of time for the task.
6. When the subject withdraws the stylus from the last hole, stop the stopwatch.
7. Record the time in seconds required in completing the task, and the number of contacts recorded on the impulse counter.

For the second part of this experiment it is required from the subject to use the slot type plat (grooved steadiness tester).following a similar procedures as the Hole plat:
1. Reset the counter and stopwatch to zero.
2. Flip the toggle switch to the start position.
3. Start the stopwatch at the same time.
4. Start moving the stylus from the wider end to the narrower end.

5. The counter can be attached to the stylus to automatically count the number of touches (errors).
6. Record the total amount of time for the task, the distance at which the first error was made, or improvement across trials.
Note: do not reset the stopwatch and the counter until the person finishes the 9 holes.

Scoring:

The score consists of the time in seconds taken to complete the task, and the number of contacts recorded on the impulse counter.

Requirements:

1. Calculate the mean value and standard deviation for the results, and write their values in the table.

2. From the results, specify who the fastest subject. And the most accurate subject, what does that indicate?

3. What is the effect of decreasing the hole-diameter on the number of errors shown on the counter?

4. Is there a need for visual acuity in this experiment?

Experiment # (7-B): Arm-hand steadiness

Objective:
Measure the aspects of steadiness, arm-hand coordination.

Arm-hand steadiness is the ability to hold one's hand and arm in a specific position for a relatively short period of time. This ability is highly related to the category of precision working. Specifically, it can be seen in the occupations of dentistry or watch repair. In these jobs, tools need to be held in a precise position for at least a short period of time. This factor does not involve eye-hand coordination, as is the case with the aiming factor.

Apparatus:

Hole plate is a manipulative dexterity test .The subject's task is to hold a metal-tipped stylus in 9 progressively smaller hole sizes stationary without touching the sides, see Figure 7.
Hole diameters: 1.156, 1.125, .5, .312, .25,.187,.109,.093,.078 inches.
Stylus diameter: .0625

Figure 1: Hole plate

Experiment procedure:

1. The person stands at a comfortable distance from the hole-plate holding the stylus in the dominant hand.
2. Reset the counter and stopwatch to zero.
3. The instructor should hold the stopwatch in one hand and ready his other hand to flip the toggle switch to the start position. The instructor should flip the toggle switch on and start the stopwatch at the same time.
4. The subject will hold the stylus in each of the specified 9 holes without touching the edges for **15** seconds. Each time the stylus touches an edge, it will be registered on the counter as an error or contact.

Note: reset stopwatch to zero for each hole but do not reset the counter until the person finishes the 9 holes.

5. Record the number of contacts made as registered on the counter.

Scoring:

The score consists of the number of contacts made for all the five holes.

Requirements:

5. Calculate the mean value and standard deviation for the results, and write their values in tables.
6. What is the difference between aiming and arm-hand steadiness procedure?

7. What is the effect of decreasing the hole-diameter on the number of errors shown on the counter?

8. Is there is a need for visual acuity in this experiment?