

Dual Task Techniques to Assess Attention Demands

Name: _____ Score _____

Activity 1: The Probe Technique

Introduction: The probe technique is a dual-task procedure involves a primary task of interest and the use of a discrete secondary task. The primary task in this experiment is to move a hand held stylist through the maze in reverse imagery. The discrete secondary task is to depress a key or handheld button when a light is lit or to a buzzing sound initiated at different stages throughout the maze. This approach is very popular with researchers who are interested in measuring one's attention at different stages of a movement. The rationale behind the probe technique is that the performer's attention at different stages of the primary will differ when required to respond to a secondary task. Thus, performance of responding to the light being lit or buzzing sound would differ at the beginning (B), initial (I), middle (M), terminal (E), and just after completing (A) the maze. It is assumed that the slowest reaction time in responding to the secondary task across the differing stages of movement this phase require more attention and maybe a critical phase in performing the primary task. The phase where the reaction time is fastest indicates the learner has the least attention.

Purpose: To examine at what stage in performing a skill requires the most attention.

Equipment: Motor maze with reverse imagery mirror, handheld stylist, reaction time apparatus, light or sound activator and reaction time keys or hand held button.

Procedure: You will be seated at a table in front of a motor maze holding the handheld stylist. While looking into the mirror the subject will move the handheld stylists from the beginning of the maze to the end. The subject will then be asked to place their left or right hand on a RT key. The primary task is to continue to move the stylus through the maze. However, on some trials the light or sound signal will be given. When you sees or hears the signal, your are to depress the key without decreasing or stopping the stylus.

The lighting of a bulb or initiation of a sound will occur at different times during the movement is the independent variable where as the subject' reaction time in msec is the dependent variable.

The number of trials given will vary until all the probe condition are recorded. The experimenter should include several dummy trials to keep you from guessing. The light signal (probe) or sound (probe) will be administered at 5 different points of the movement.

These are the probe points:

- 1) B-before the movement begins and while waiting to move.
- 2) I- at the beginning the movement (30 or 70 cm mark)

- 3) M - in the middle of the movement (50 cm mark)
- 4) T - at the end of the movement (70 or 30 cm mark)
- 5) A - just after the movement is completed.

For each attempt the experimenter will say "**ready, "move."** You **will receive no knowledge of results** about the outcome of their performance. The experimenter will record the 5 trails where the probe has been conducted in Table 1. The experimenter should provide additional dummy trials to keep the subject honest and prevent them from know when the probe will occur while performing on the maze.

Activity 2: The Continuous Secondary-Task Technique

Introduction: The continuous secondary task technique requires the performer to maintain performance on a primary task while continuously performing a secondary task. The primary task in this experiment is to tap your foot as quickly as possible. The secondary tasks are foot tapping and drawing a star in reverse imagery. Perform the foot tapping with your nondominate foot and your dominate index finger as quickly as possible. The rationale behind the continuous secondary task technique is that the secondary task will diminish the processing space required to perform the primary task. Thus, performance on the primary task should be poorer than if it would be carried out alone.

Purpose: To examine the capacity of our attention when performing two tasks simultaneously.

Equipment: Foot tapper, finger tapper, handsteadiness task, reaction timer and four counters

Procedure: The first phase of this study is where you will be required to tap with the nondominate foot as quick as possible for three 15 seconds periods. You are to tap as fast as you can for each three 15 second period. The experimenter will record the total number of taps per 15 second period in Table 2. The **mean** score on the three 15 second tapping task will calculated and will be your baseline data for the primary task, that is, foot tapping.

After completing the first phase of this experiment, you will complete one-15 second trial while drawing a star counter clockwise in reverse imagery with non-dominate hand, tapping a key with your index finger with dominate hand, and foot tapping with non-dominate foot. All three skills are to be performed simultaneously. If during any trial you stopped performing any one of the three skills, the trial must be repeated. The experimenter will record your total foot taps for the baseline and experimental trials.

The Probe Technique Data Collection Form

Data Collection: Your reaction time will be recorded for B, I, M, T, and A. Record your

reaction time data in ms for B, I, M, T, and A stages in Table 1.

Table 1: Individual Probe Reaction Times

Subject	B	I	M	T	A
Scores					

Graphing: Develop a **BAR GRAPH** by plotting your RT for B, I, M, T, and A reaction times. X-axis is labeled, "Different probe conditions" and the Y-axis is labeled, "RT".

Continuous Task Technique Data Collection Form

Data Collection:

The number of taps for each subject in the baseline and experimental category will be recorded. Calculate the baseline means for the overall tapping and the experimental trial. Your baseline mean (A) and the experimental trial (B) will be in graphed and used in answering the discussion questions required in this study.

Table 2: Individual Continuous Task Technique Data Form

Subject	Baseline Trial 1 (Alone)	Baseline Trial 2 (Alone)	Baseline Trial 3 (Alone)	Mean Baseline (A)	Experimental Trial (B)

Graphing: Develop a **BAR GRAPH** by plotting the **overall** (last row in above table) baseline(A) and experimental (B) scores. X-axis is labeled Conditions. In your legend you should have the baseline and experimental conditions indicated. The Y-axis is labeled, "# of taps." Attach the graph to the back of this lab.

LAB QUESTIONS

Lab Questions (All lab questions and answer must be type written, proper spelling, paragraph and sentence form not outlined, proper margins with time roman font and 12 pic letters)

1. Write a summary of your probe results that indicates what phases that demanded the

most and least attention. Use your means and/or graph as support. Provide one example of how the probe technique can be used in a practice situation where you are developing or retraining a motor or sport skill. Please read the material in the closer look box on page 203 about the probe technique.

2. Write a summary of your continuous task results focusing on how much the star tracing task and finger tapping tasks had on your foot tapping ability then use one of the three theories of attention (filter, central capacity, or multiple resource theory) to explain why the mirror tracing and finger tapping task affected your foot tapping ability. Please read the material in the closer look box on pages 203 about the continuous task technique.

3. Magill has an example of the dual task interference during gait in people with Parkinson's Disease (A Closer look Box on page 204 of your text. How was the dual task interference technique used to study people with Parkinson disease? What conclusions can be draw from this study that could be used in professional practice?