Memory Lab

Name:_____   Date:_____

Lab Activity 1: Passive and Active Memory Condition

Introduction: An important factor on remembering is the relationship between the practice context and performance characteristics by performer. In many cases the test context in physical education or sport is having the students or athletes play a game or sport. In physical therapy the test context would be performing the skill in a real life situation such as walking across a busy street intersection in retraining one to walk. Researchers have termed this memory principle as the encoding specificity principle. The encoding specificity principle indicates that the there needs to be a close relationship between encoding and retrieval memory processes experienced in practice to that of test context or real life situations.

Purpose: This lab will examine the encoding specificity principle by adopting the procedures used in an experiment conducted by Lee and Hirota (1980) using an arm-position task found on page 250 of your text.

Hypothesis to be tested. The encoding specificity principles predictions in this lab is active movements to the criterion arm location will be recalled with more accuracy as compared to passive recalled movement.

Equipment: Kinesiometer, meter stick, or linear slide apparatus, blocks, pencils, and blind folds.

Procedures: Each student will perform 16 recall trials. The student will be blindfolded across all the trials. Each subject is attempting to learn to move their arm a 40 cm distance if one uses the meter or linear slide apparatus or 40 degrees if you use the kinesiometer.

Active Movement Condition. On 8 trials, you will move a pointer using your non-dominate arm while being blindfolded from a starting position to end position specified by a physical block. The physical block at the end point prevents one from moving the pointer beyond the end point. You will move the arm freely from the starting position once the command to move by the given experimenter. Immediately after moving to the block, your arm will be repositioned at the starting point then you be asked to recall the distance (if you are using the meter stick or linear slide apparatus) or degree (if you are using the kinesiometer) moved but the physical block will be removed. The experimenter then records your result long (+) or short (-) of the criterion distance (40 cm) or degrees (40) to the nearest millimeter (mm) or degree. For example if one moved 45 cm and the criterion is 40 cm, then it would be recorded as +50 mm if you are using the meter stick or linear slide apparatus. If one moved 35 degrees and the criterion is 40 degrees, then it would be recorded as – 5 degrees if you used the kinesiometer.

Passive Movement Condition. On 8 randomly, the experimenter will physically (passively) move the non-dominate arm and hand from the starting location to end position. After moving the subject's hand from the start to end, the subject hand will be repositioned at the start, he or she will perform a recall test where he or she will move their arm and hand to the end location. The experimenter then records your result long (+) or short (-) of the criterion distance (40 cm) or degrees (40) to the nearest millimeter (mm) or degree. For example if one moved 45 cm and the criterion is 40 cm, then it would be recorded as +50 mm if you are using the meter stick or linear slide apparatus. If one moved 35 degrees and the criterion is 40 degrees, then it would be recorded as – 5 degrees if you used the kinesiometer.

If you are the experimenter, randomize the beginning point and recall conditions. These controls are essential to prevent any subject bias in performing during recall. The start positions can be presented in both directions, that is, one trial may be performed going to your right and other to the left.

Data Collection: The experimenter must randomize the start points and recall conditions (8 active & 8 passive). Record your accuracy scores to nearest mm and record if they were short (-) or long (+) of the criteria end point.

Table 1: Individual Data Collection

Randomize Criterion Start Point Location	Randomize Passive & Active Recall (need 8 for each condition)	Trials	Passive Condition Recall scores (only 8 scores should be recorded)	Active condition Recall Scores (only 8 scores should be recorded)
		1		
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		
		16		
Calculate your Absolute Error Score for the Passive & Active Condition*				
Calculate your Constant Error Score for the Passive & Active Conditions				
Calculate your Variable Error Scores for the Passive and Active Conditions				

Calculations & Graphing: Refer to the measurement (lab 2) in how to calculate the error score. In this lab C = 0 and K = 8.   Show your work for each error score. Develop 1 graph that includes all the error scores for the 2 experimental conditions.

Lab Activity 2: Capacity of working memory

Introduction. The ability to recall movements in order they are presented is important in learning any procedural skills such as in learning the proper dance steps in the fox trot or swing dance. In physical therapy, the client is asked to perform a series of strength and flexibility exercises in an exact order to rehabilitate a shoulder or hip. The exercise specialist has their client perform lifting exercises in an order to achieve the greatest gains in strength. Researchers have found that movement that procedural skills are the most difficult skill to retain and remember. Procedurals skills have an exact order in which the movements or phases must be followed. Those movements or phases of the movement presented in beginning and last are more readily recalled than parts that came in the middle. For example, after demonstrating a dance, the learner will can recall the beginning and ending movement but have a more difficult time in recalling the middle steps. This relationship between procedural skills and ability to remember called the primacy-recency affect. One can remember and recall the first parts and last parts of a movement but seem to have problems recalling the middle parts.

Purpose. The research question in part is: "Will the ability to recall a movement routine be related to the number of parts presented?" The independent variable in this activity is the number of parts of the movement presented and the dependent variable is the ability to recall correctly the parts in the same order presented. The theory of the limited capacity of the working motor memory would support the research hypothesis that recall is inversely related to the amount of information needed to be recalled. Also, the primacy-recency affect of the working memory would support the research hypothesis that recall is affected by the order they are presented; beginning and ending parts will be recalled more often than the middle parts.

Procedure. The lab members will be randomly assigned to one of three groups: 5-movement group, 8-movement group, and 10-movement group.
A video of the movement to be recalled will be viewed by the subject. Once the subject has viewed the video. They are to recall or perform all the movements in the correct order from start to end.

Data Collection. Award a √ in the table if the part is passed in the correct order. Award an X if the part is not completed.

Scoring: The lab is scored by percent of parts each student in the group recalled in the exact order. For example subject 1 performed the 5 part movement, the first 2 parts were in their exact order but parts 3 and 4 were out of order but part 5 was correct. Therefore the score for this subject was 3 out of 5 parts, the percent correct will be 60%.

Record: Record your results and % percent on the board developed by your instructor for 5, 8, and 10 recall conditions.

Subject's Score Sheet & % Correct

Group 5 Subject	1	2	3	4	5	6
One step forward						
Jump forward with both feet						
Step to the right						
One step backwards						
Jump to the left						
Total Correct						
% correct						
Total Group % Correct (sum all individual % then divide it by # of subjects)						

Group 8 Subject	1	2	3	4	5	6
One step forward						
Jump forward with both feet						
Step to the right						
One step backwards						
Jump to the left						
Spin clockwise around once						
Skip forward 3 steps						
Balance on your right foot						
Total correct						
% correct						
Total Group % Correct (sum all individual % then divide it by # of subjects)						

Group 10 Subject	1	2	3	4	5	6
One step forward						
Jump forward with both feet						
Step to the right						
One step backwards						
Jump to the left						
Spin clockwise around once						
Skip forward 3 steps						
Balance on your right foot						
Spin counterclockwise once						
Balance on your left foot						
Total correct						
% correct						
Total Group % Correct (sum all individual % then divide it by # of subjects)						

Graphing: Develop a graph plotting the total group mean % correct of each groups. X-axis should be groups and Y-axis should be % correct.