MAPS3 SPECIFICATIONS
(updated 09/12/2006)

Is retrieval practice better than study for map learning?

Task: Learn the objects and locations for 2 different maps via testing vs. re-studying.

Stimuli: 2 fictitious maps with 10 objects each (see p. 8). Maps can be found in Tara → Shana → Maps → Maps3

Design:

There are 3 phases to the experiment: (1) Training Phase, (2) Map Learning Phase, and (3) Test Phase.

I. Training Phase: Subjects become familiar with the task by practicing on random shapes.
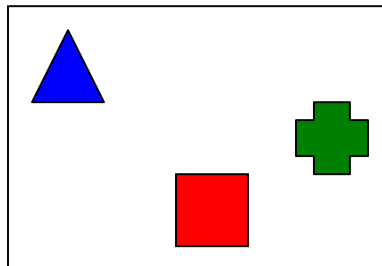
Instructions 1:
Thank for your participation. This experiment involves learning the location of various features. Each trial will begin by presenting a display of features, as in the example below.
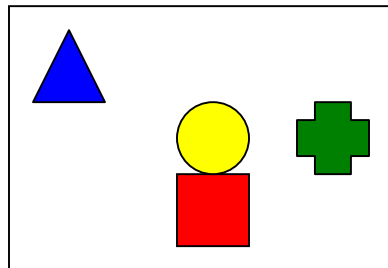
You will have 20 seconds to study what the features are and where they are located.

After 20 seconds, you will be presented with a quiz, in which one feature will disappear, as in the example below:

You will be asked to remember what the missing feature is, and where it is located. Hit the spacebar as soon as you remember the feature and its location.

Press the spacebar for more instructions

Instructions 2:

After you press the spacebar, the correct answer will appear on the screen.

Then we would like you to score yourself on whether or not you got the answer right. Press the key marked "wrong" if you got it wrong, and press the key marked "right" if you got it right.
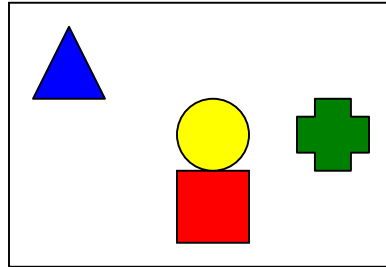
In this example, the missing feature was the yellow circle, above the red square and to the left of the green cross. If you incorrectly remembered that information, you will press "wrong." If you correctly remembered it, you will press "right."

There is a fixed time limit to the quiz, regardless of how many features you get wrong or right. Therefore, you may be tested more than once over each feature.

Instructions 3:
After the quizzes have been completed, we will test you over ALL of the features. If you score within the top 1/3 of all the subjects who are doing this experiment, we will give you a cash reward of $10.

So, just to recap: Each trial will present a display of features for 20 seconds. You will learn what the features are and their locations. A quiz will follow, where we remove one feature and you will hit the spacebar once you have a clear idea of the feature and location. Then the correct answer will be presented on the screen and you simply hit "wrong" if you remembered it incorrectly, or "right" if you remembered it correctly. Once all the quizzes have been completed, you will be tested on all of the features.
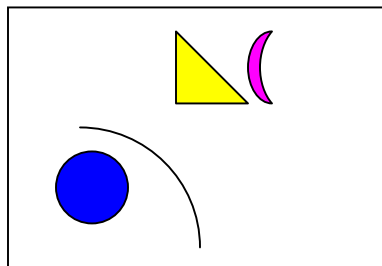
You will now complete a practice phase before you begin the experiment. Press the spacebar to begin the practice phase.

Instructions 4:
On the next screen, you will see a new assortment of features. Please study the assortment for 20 seconds.

Press the spacebar to begin.

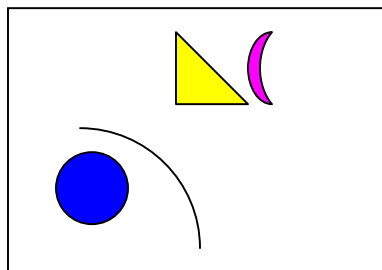Leave the shapes below on screen for 20 seconds.

Time's up!

Wait for 2 seconds.

Insert blank screen for 1 second.

Go through steps 1 - 5, and then exit when 100 seconds has passed.

1. Present the shapes again, along with the instructions below (Press the spacebar for the quiz).

Press the spacebar for the quiz.

2. When subject presses spacebar, insert blank screen for 1 second. Then randomly choose an object to disappear. Present the instructions below (Press the spacebar for the answer).
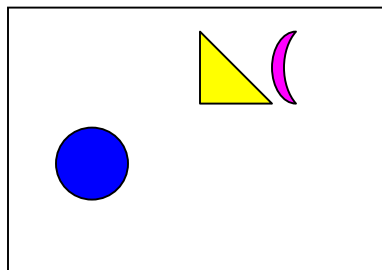
Press the spacebar for the answer.

3. Present all of the shapes again when subject presses the spacebar, and present the instructions below (Press "wrong" if you got it wrong, and press "right" if you got it right).

Press "wrong" if you got it wrong, and press "right" if you got it right.

3
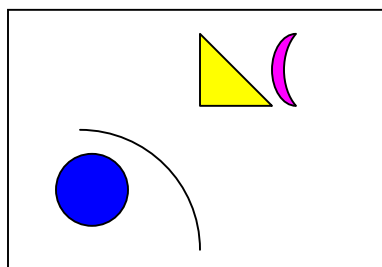
4. Go back to # 1 and quiz over different randomly chosen object, until all 4 objects have been quizzed.

5. Go back to # 1 and quiz over objects that were marked "wrong." If no objects were marked wrong, go to # 4.

After 100 seconds…

Instructions 6:
Time's up!

That's the end of the practice phase. If you have any questions, ask the experimenter now.

Press the spacebar to begin the experiment.

II. Learning Phase:

Assign each subject to one of the following 8 conditions:

	Condition							
Learning Phase Order	1	2	3	4	5	6	7	8
1	Map A - Study	Map A - Study	Map A - Test	Map A - Test	Map B - Study	Map B - Study	Map B - Test	Map B - Test
2	Map B - Test	Map B - Test	Map B - Study	Map B - Study	Map A - Test	Map A - Test	Map A - Study	Map A - Study

Final Test Order								
1	Map A	Map B	Map A	Map B	Map A	Map B	Map A	Map B
2	Map B	Map A	Map B	Map A	Map B	Map A	Map B	Map A

Instructions 7:
For this phase of the experiment, you will be doing a task that is very similar to the one you just completed for the practice phase. However, instead of learning the locations of random shapes, you will be learning the locations of "real" features on a map. You are going to learn 2 maps, one at a time.

Later, we will test you over ALL of the features on each map. If you score within the top 1/3 of all the subjects who are doing this experiment, we will give you a cash reward of $10.

Press the spacebar to study the first map for 20 seconds.

Present the map for 20 seconds, followed by Instructions 8.

Instructions 8:
Time's up!

- Test Condition:

  Instructions 9:
  Now we are going to quiz you over the map, just like in the practice phase. Press the spacebar to begin.

  Go through steps 1-5 as in the practice phase.

  After 100 seconds…

  Instructions 10:
  Time's up!

  Press the spacebar for the next map (if condition 2 or 4)
  Now you are finished learning the maps. Please see the experimenter (if condition 1 or 3)

- Study Condition:

  Instructions 10:
  Now we are going to show you the same map again. Study the map carefully again for 100 seconds. Press the spacebar to begin.

  Present map again, with all objects, for 100 seconds.

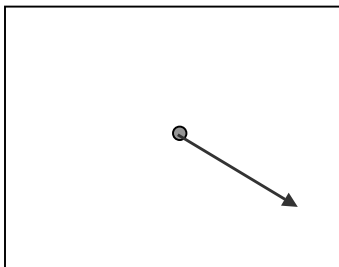 After 100 seconds…

  Instructions 11:
  Time's up!

  Press the spacebar for the next map (if condition 1 or 3)
  Now you are finished learning the maps. Please see the experimenter (if condition 2 or 4)

III. Final Test Phase

Begin 30 minutes after Map Learning Phase. Give each subject a blank screen with an arrow in the middle.

Instructions 12. Use these instructions for conditions 1, 3, 5, and 7. Display these instructions on a screen by itself.

Now we are going to test your memory for the maps you learned 30 minutes ago. We will give you one of the map features as a starting point, and we will ask you to remember where a different feature was located in relation to that starting point. For example, try to remember the map of the town you learned earlier. Pretend you are at the airport and you want to get to the bus station. The dot in the center of the screen represents the airport. Where would you go from the airport to get to the bus station? Starting from the airport in the center, you would move the arrow to the exact location where you think the bus station was located.

If you have any questions, ask the experimenter now.

Press the spacebar to begin.

Instructions 13. Use these instructions for conditions 2, 4, 6, and 8. Display these instructions on a screen by itself.

Now we are going to test your memory for the maps you learned 30 minutes ago. We will give you one of the map features as a starting point, and we will ask you to remember where a different feature was located in relation to that starting point. For example, try to remember the map of the recreational area you learned earlier. Pretend you are at the restrooms and you want to get to the golf course. The dot in the center of the screen represents the restrooms. Where would you go from the restrooms to get to the golf course? Starting from the restrooms in the center, you would move the arrow to the exact location where you think the golf course was located.

If you have any questions, ask the experimenter now.

Press the spacebar to begin.

Instructions 14. Display these instructions on the same screen with the arrow.
If you start out at _____ (insert symbol of feature), how would you get to _____ (insert symbol of other feature)? Assume _____ is in the middle, and move the arrow to the exact location where you believe _____ should be. Press 'Okay' when you are finished.

Thus, features are arranged in pairs for the final test—one feature is the starting point, and the other feature is the one whose location subjects must estimate by using the arrow.

There are 90 possible pairwise combinations of all the features from each map (see table below). For each subject, randomly sample one pairwise combination at a time, without replacement.

All possible pairwise combinations of the 10 features from each map:

1 → 2	1 → 3	1 → 4	1 → 5	1 → 6	1 → 7	1 → 8	1 → 9	1 → 10
2 → 1	2 → 3	2 → 4	2 → 5	2 → 6	2 → 7	2 → 8	2 → 9	2 → 10
3 → 1	3 → 2	3 → 4	3 → 5	3 → 6	3 → 7	3 → 8	3 → 9	3 → 10
4 → 1	4 → 2	4 → 3	4 → 5	4 → 6	4 → 7	4 → 8	4 → 9	4 → 10
5 → 1	5 → 2	5 → 3	5 → 4	5 → 6	5 → 7	5 → 8	5 → 9	5 → 10
6 → 1	6 → 2	6 → 3	6 → 4	6 → 5	6 → 7	6 → 8	6 → 9	6 → 10
7 → 1	7 → 2	7 → 3	7 → 4	7 → 5	7 → 6	7 → 8	7 → 9	7 → 10
8 → 1	8 → 2	8 → 3	8 → 4	8 → 5	8 → 6	8 → 7	8 → 9	8 → 10
9 → 1	9 → 2	9 → 3	9 → 4	9 → 5	9 → 6	9 → 7	9 → 8	9 → 10
10 → 1	10 → 2	10 → 3	10 → 4	10 → 5	10 → 6	10 → 7	10 → 8	10 → 9

Map A - Town:
1 = downtown
2 = airport
3 = bus station
4 = church
5 = gas station
6 = school
7 = houses
8 = park
9 = ship
10 = lighthouse

Map B - Recreational area:
1 = telephone
2 = golf course
3 = picnic table
4 = playground
5 = trash
6 = camp sites
7 = fishing
8 = boat
9 = swimming
10 = restrooms

Instructions 15
This completes the test over the first map. Press the spacebar for the test over the second map.
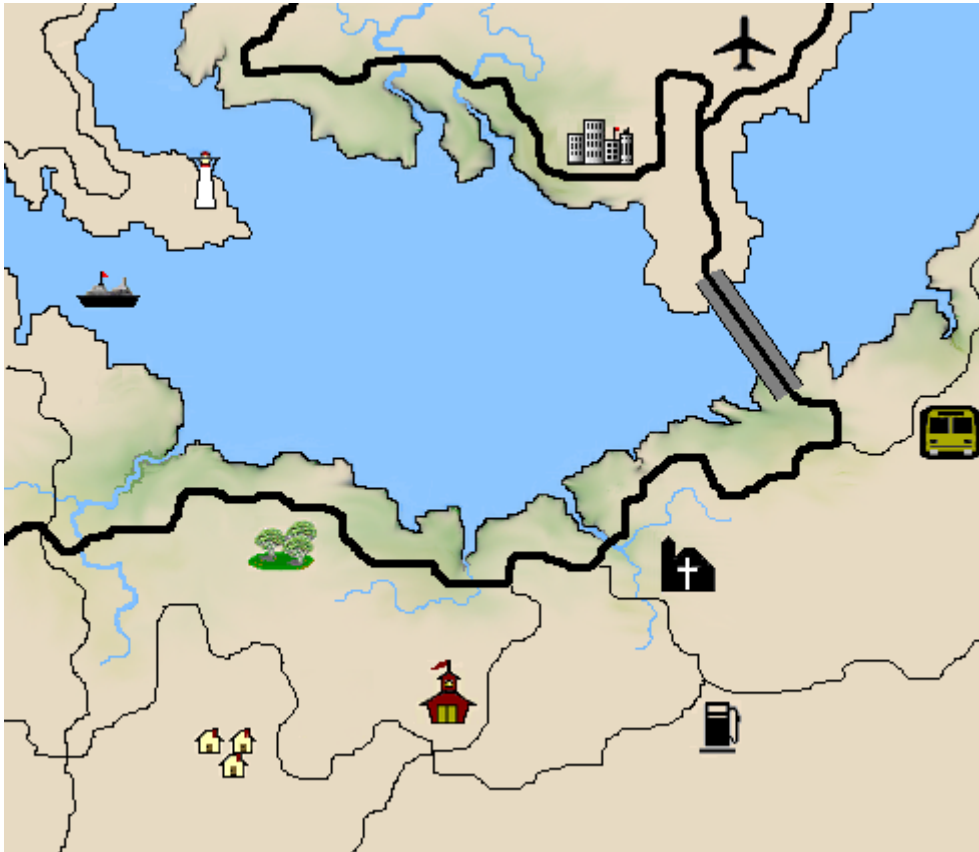
Repeat Final Test for the second map, with Instructions 14.

Instructions 16
You are now finished with the experiment. Thank you for your participation!

In this experiment, we are interested in how well you can learn the features of maps according to what kind of learning strategy you use. Specifically, we want to know whether you learn the map features better by trying to recall those features, or by simply studying the map for the same amount of time.

Map A – Town

Map B – Recreational Area