

Most Intelligent Mammal

Pre-Lab Discussion

Mammals have the most highly developed brain of all animals. This enables them to perform a wide range of complicated behaviors.

Some of a mammal's behaviors are unlearned. This means that the mammal is capable of performing the behavior without being taught. Unlearned behaviors include **reflexes** and **instincts**. Reflexes are simple, quick, automatic responses – jerking away from contact with a hot object, for example. Instincts are inborn behavioral patterns that can be modified very little, if at all. A spider's web-building, a crane's courtship dance, and a newborn mammal's suckling are examples of instincts.

Many of a mammal's behaviors are learned, or acquired through experience. Because mammals have a large, highly sophisticated cerebrum – the part of the brain involved with learning, memory, and thinking – they are capable of performing a wide array of learned behaviors. Some examples of learned behaviors in humans include habits and solving visual or word problems. This most advanced type of learned behavior is known as insight learning, or reasoning. Reasoning is the ability to apply previous learning to a totally new situation. Reasoning is rare in animals other than primates and is found most often in humans, which are the most intelligent of all mammals.

In this investigation, you will study learned and unlearned human behavior.

Problems

- Which types of human behaviors are unlearned and which are learned?
- What roles do reflexes, conditioned responses, habits, trial-and-error learning, and reasoning play in human behavior?

Materials

- Paper
- Pencil
- Stopwatch

Safety

Use caution when handling all tools in this lab.

Procedure

Part A: Reflexes

1. A reflex is a simple, automatic response to a stimulus. A reflex usually involves only part of the body. Working with a partner, you will alternate as subject and helper while you test two human reflexes.
2. Close your eyes and cover them with your hands. At the end of one minute, remove your hands and open your eyes while your partner watches your eyes closely.
 - a. Record the response in Data Table 1.
3. Stand with your side to a wall. Hold your arm down at your side and slightly away from your body. Tightly press the back of your hand against the wall until your shoulder begins to ache. After one minute, step away from the wall while still holding your arm stiff.
 - a. Record the responses in Data Table 1.

Data Table 1

Stimulus	Response
Light	
Pressure on arm muscle	

Part B: Conditioned Responses

1. Read the following instructions to your partner:

*“Each time I say ‘write’, I want you to make a tally mark on a sheet of paper.
Then, place your pencil in position to make the next mark.”*
2. Give the command to write several times in succession. For most of the commands, hit your pencil on the desk at the same time you say the word “write”.
3. Occasionally, hit your pencil on the desk but do not give the command to write. Try this several times.

Observations

1. What happened when you hit the pencil on the desk but did not give the command to write?
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Part C: Habits

1. Use your normal writing hand to write your name as many times as you can in 30 seconds. Follow the same procedure in the second column using your other hand.

Normal Hand

Other Hand



2. Dictate the following passage to your partner while he or she writes it down. Dictate at a fairly rapid pace.

“Habits are often useful in allowing routine activities to be carried out quickly. But most of us have some habits that we would like to break. Breaking a habit is not a simple thing to do.”

3. Dictate the same passage again, but this time instruct your partner not to cross any t’s or dot any i’s.

Observations

1. For number 1, how many times did you write your name with your normal writing hand?

2. For number 2, how many times did you write your name with your other hand?

3. For number 3, how many times did you cross t’s or dot i’s in the second passage?

Part D: Trial-and-Error Learning

1. Trial-and-error learning begins when an animal associates certain responses with favorable or unfavorable consequences. The animal then tries to repeat those behaviors that lead to favorable results.
2. Find out how quickly you can successfully complete a path through Maze 1 in Figure 1. Use a pencil to mark your path and have your partner time you. Record the time needed to complete Maze 1 in Data Table 2 (on the next page).
3. Complete the rest of the mazes in succession, timing each one as you go. Cover each completed maze as you finish so you cannot look back at the completed mazes. Record your results in Data Table 2. Then, graph your results on the following page.

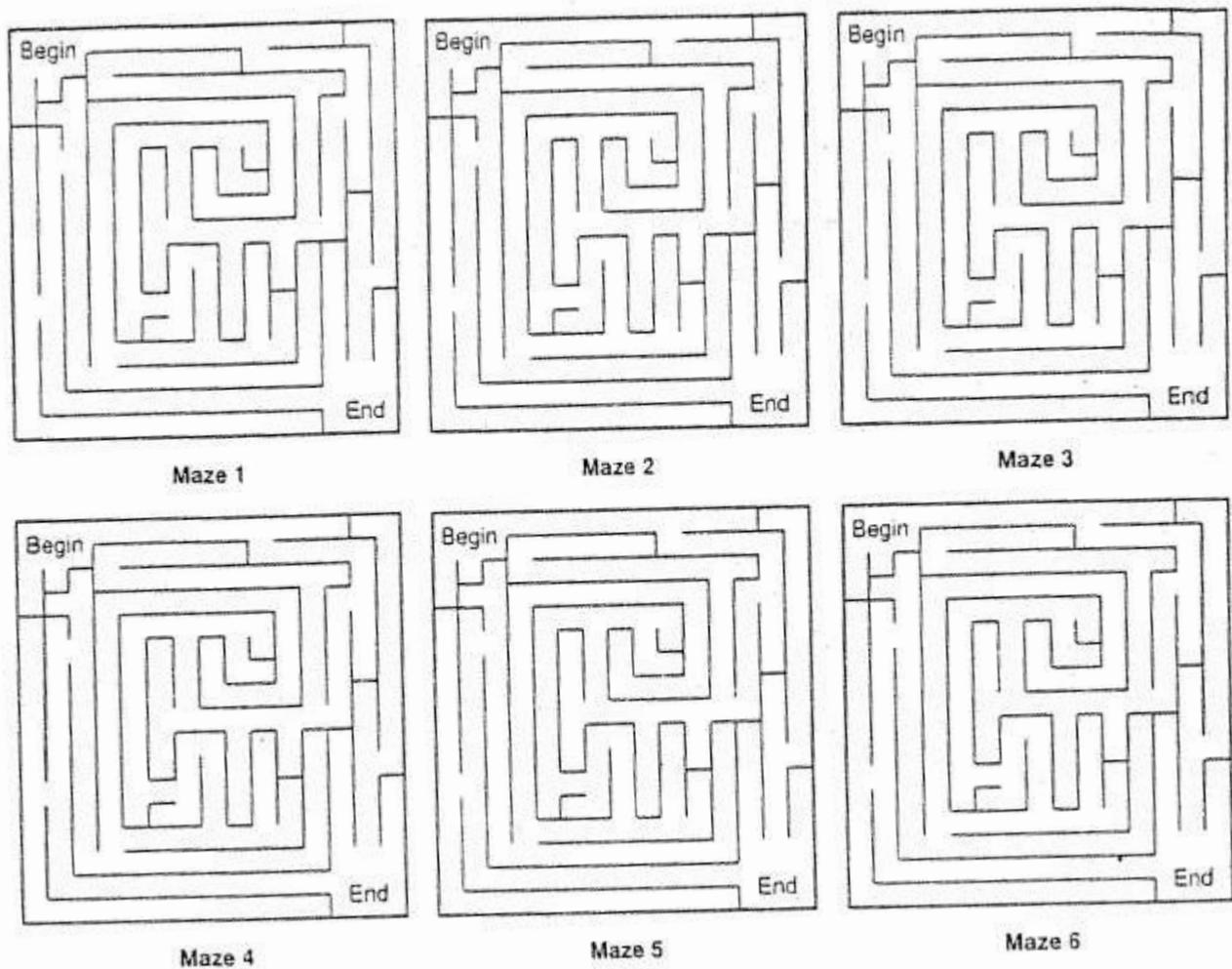
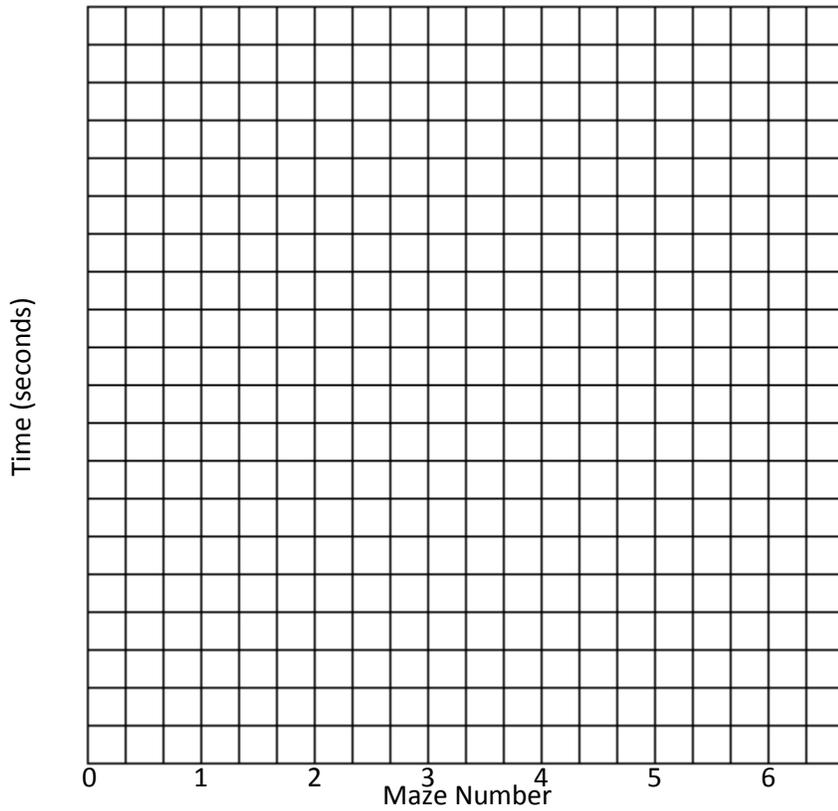


Figure 1

Data Table 2

Maze Number	Time (seconds)
1	
2	
3	
4	
5	
6	

Graphing Rules: *title, scale the Y-axis, plot data points, draw the line of best fit.*



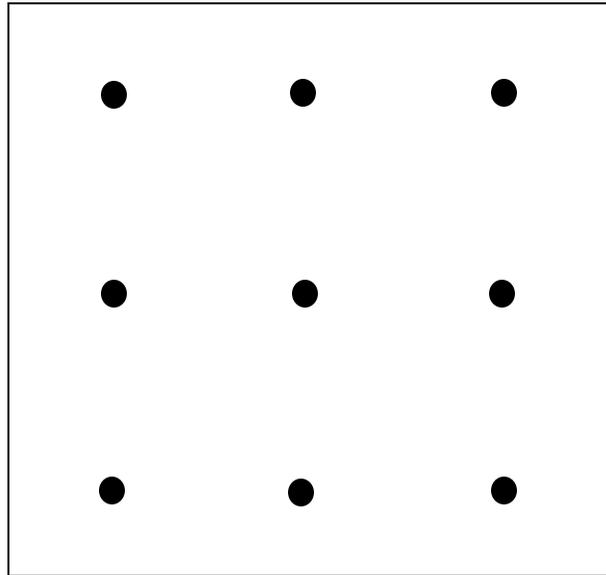
Part E: Reasoning

1. Reasoning is a type of learning that involves thinking, judgment, and memory. Reasoning enables humans to solve new problems without resorting to trial-and-error.
2. Use your ability to reason to solve the following problems:

- a. There are four separate, equal-sized boxes. Inside each box there are two separate small boxes. Inside each of the small boxes there are three even smaller boxes.

What is the total number of boxes? _____

- b. Figure 2 represents nine bears in a square enclosure at the zoo. Build two more square enclosures **within this one** so that each bear is in a pen **by itself**. Draw the border of the two new enclosures directly on Figure 2.



- c. There are five girls: Maureen, Sue, Jill, Robin and Pam. They are standing in a row, but not necessarily in the order named. Neither Maureen nor Sue is next to Robin. Neither Sue nor Maureen is next to Pam. Neither Robin nor Sue is next to Jill. Pam is just to the right of Jill. Name the five girls from left to right.

Analysis and Conclusions

1. Name three other reflexes in humans.
2. How are reflexes useful to humans?
3. Is a reflex a learned or unlearned behavior?
4. Were you able to condition or “fool” your partner into always making a mark on the paper when you hit your pencil on the desk but did not give the command to write? Explain why you think you were or were not able to do so.
5. Is the response to the pencil tap a learned or unlearned behavior?
6. Why did a difference exist in the number of times you could write your name with your normal writing hand and with your other hand?
7. What would you have to do to make your signature written by both hands the same?
8. Is a habit a learned or unlearned behavior?
9. Did any learning take place in Part D of this investigation? Give evidence to support your answer.

Critical Thinking and Application

1. How is the blinking response a protective reflex?
2. Describe three conditioned reflexes that you exhibit while at school.
3. How might you go about breaking yourself of a particular habit?
4. Describe three situations in which you learned through trial and error.
5. Describe two situations in which the ability to reason was useful to you.