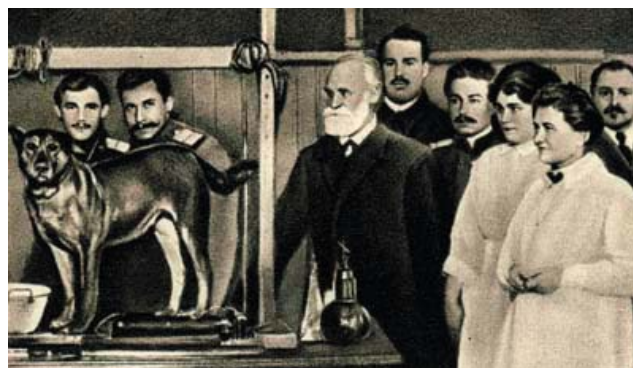


# Paired Associates Learning, the Shortfalls of Behaviorism, and the Rise of Cognitivism

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## Part I—Two Perspectives

In the study of human learning and memory, there have been two major perspectives: behaviorism and cognitive psychology.

Behaviorism is the view that it is not necessary to refer to knowledge or any other concept such as attention, perception, memory, or “thought” to understand behavior. Behaviorists focus on observable behavior instead of unobservable mental activity. They do not speculate about the nature of thought, but seek to explain observable behavior instead through concepts such as stimulus-response connections. This is a mechanistic view of behavior and posits that you can always predict the response if you know the stimulus.

Cognitive psychology, on the other hand, seeks to understand inner mental activity and thought. Contrary to behaviorists, cognitivists devise models and theories of memory and other cognitive activities even though these processes themselves are not viewable to the naked eye. Cognitivists seek to understand the “mind” whereas behaviorists believe it is not necessary to refer to an unseen “mind” to explain behavior.

Many psychologists of differing theoretical perspectives have been interested in human learning—in how humans acquire new information. In the demonstration we will do today, you are going to get a chance to participate in a learning experiment using lists of words.



## Part II—Two Tasks

You just participated in two types of learning tasks: a serial learning task and a paired associates learning task.

*Serial learning tasks* were pioneered by Ebbinghaus. In these tasks, a list of words is presented (one-by-one) once, and then the participants are asked to recall the list of words in order. The dependent variable is the number of trials it takes (of presentations of the list) for the participant to learn the list correctly. The first task you completed was a serial learning task.

*Paired associates learning* was also a trademark task of early learning researchers. In paired associates learning, a series of pairs of words was presented. Participants were then given the first word of the pairs and asked to recall the second word. The dependent variable is the number of trials it takes (of presentations of the pairs) for the participant to learn the list correctly. The second task you completed was a paired associates learning task.

### **Questions**

You are a behaviorist. How do you explain serial learning? How do you explain paired associates learning?



## Part III—The Behaviorist Explanation

Behaviorists explain both serial learning and paired associates learning through stimulus-response associations.

In other words, serial learning is explained as a series of stimulus-response connections between adjacent words. For example, in a list of three words, (*apple, hat, broom*), *apple* serves as the stimulus and *hat* as its response. Also, *hat* serves as a stimulus and *broom* as its response.

Paired associates learning is also explained as a series of stimulus-response connections between the items in the pair. For example, in a pair of words consisting of (*airplane-bunny*), *airplane* serves as the stimulus for *bunny*, which is the response.

Young (1959, 1961) sought to test the idea that stimulus-response connections were actually being formed through serial learning. She gave all of her participants the same serial list of words to learn. Then she broke her participants up into two groups. All of the participants did a paired associates task using the same words as were used in the serial learning task. There was a distinct difference between the pairs given to Group A and Group B, however.

### Questions

What could Young have done to test the idea that stimulus-response connections were actually formed in the serial learning task (and thus would still be “active” in the paired associates task)? Come up with a method, and be specific. Assume you have access to 100 participants. Use the following word list: CUTTING, EAGER, POLITE, AWKWARD, MORBID, CERTAIN, OBLONG, INTENSE. Write your method in terms of a “to-do” list. In other words, what is the first thing you would do, the second, etc., to design and run this experiment, and what would the participants in your study do? (Thinking about what you did in the learning experiment may help you.)



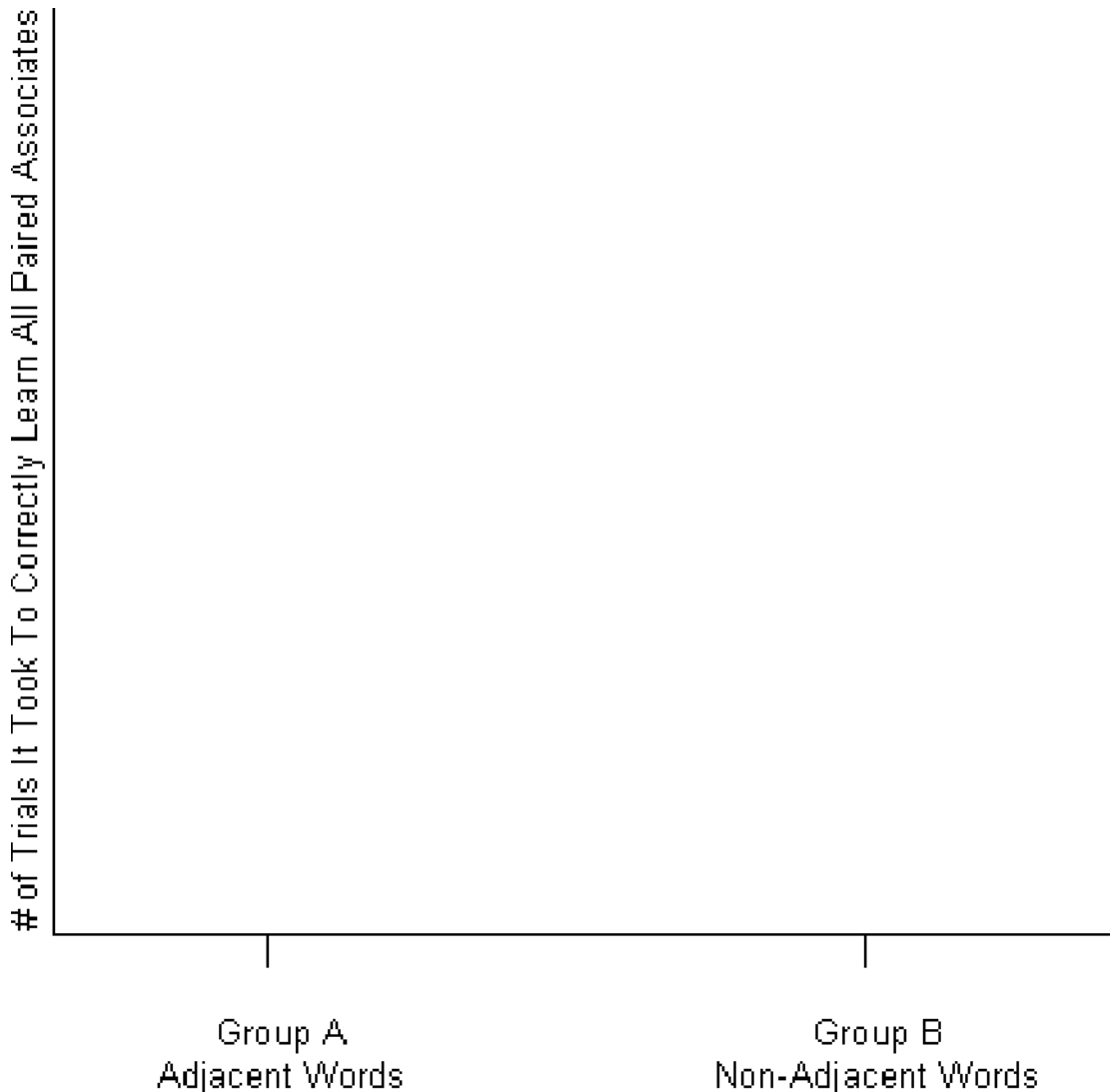
## Part IV—The Difference

Young (1959, 1961) gave Group A word pairs that were created from adjacent words in the serial list. In other words, if the serial list consisted of *apple, fan, hat, airplane, bunny, paper*, then the pairs given in the paired associates task were *apple-fan, hat-airplane, and bunny-paper*.

Young gave Group B word pairs that were created from nonadjacent words in the serial list. In other words, based on the example above, the pairs were *apple-airplane, hat-paper, bunny-fan*.

The learning experiment you completed earlier was conducted just like Young's study. You were either in Group A or Group B. Can you tell which group you were in?

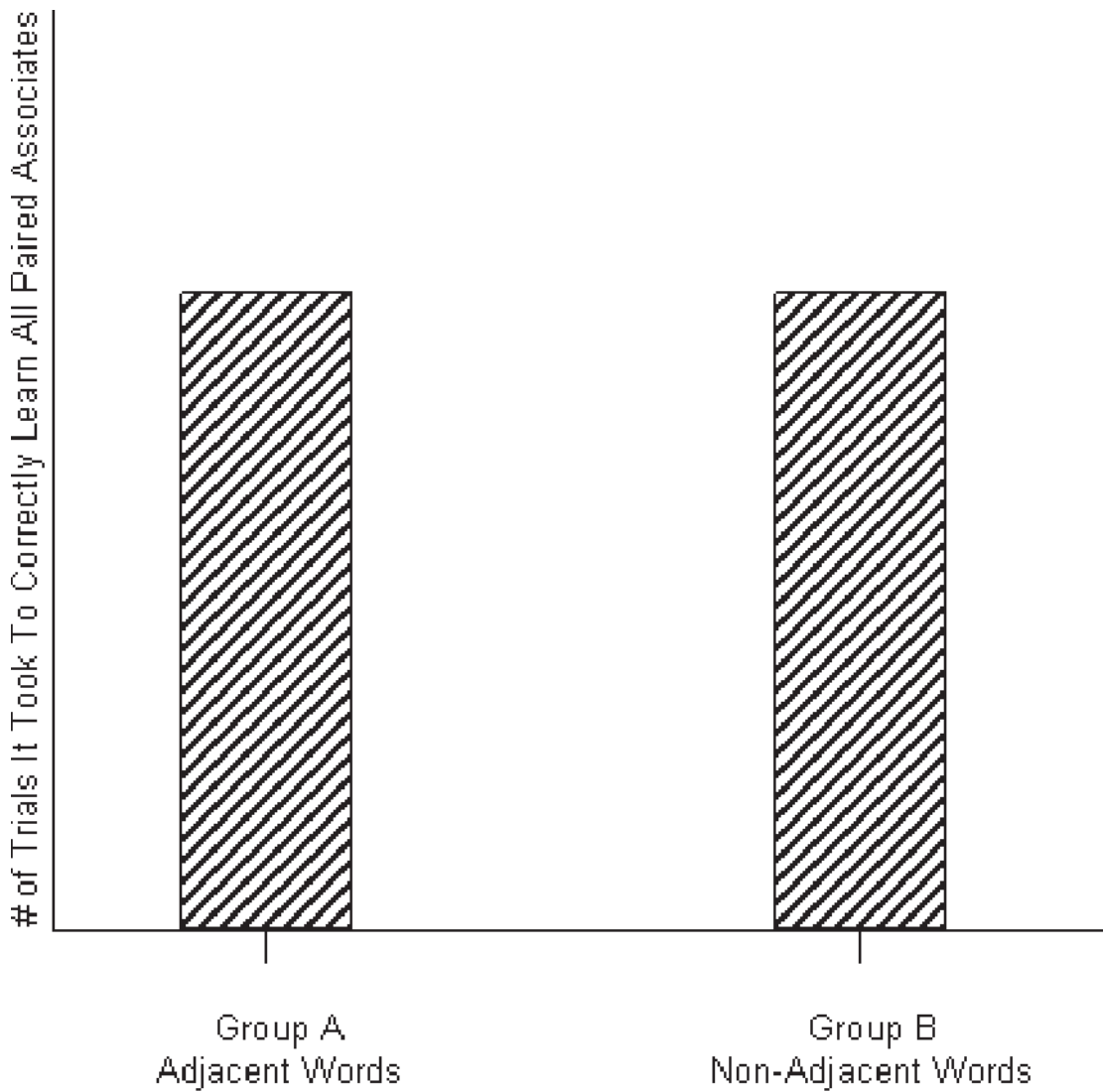
Below is a blank graph with the axes labeled. If the behaviorists were right, that is, if stimulus-response associations were formed between the word pairs during the serial learning task, then what would the results look like? Draw a bar above Group A and Group B to indicate what the results might look like.





## Part V—Young's Results

Young's results are shown below.



### Questions

1. What do these results show?
2. What do these results suggest in terms of behavioral explanations of learning?



## Part VI—Conclusion

Behavioral views were challenged for a number of reasons, including their failure to account for language learning (e.g., Chomsky, 1959; Miller, 1965), their difficulty in explaining complex human behavior (e.g., problem-solving, expertise), Piaget's concept of object permanence, and findings that were emerging in the 1960s in the field of verbal learning. This case has been an example of the latter.

In the 1960s, cognitive psychologists from the information processing approach would introduce the terms encoding, storage, and retrieval to explain verbal learning. Each of the words on the serial list are encoded into memory, stored for a brief period of time, and later retrieved. These terms are examples of the way that cognitive psychologists seek to understand inner mental activity as a cause for behavior (in this case, the inner mental activity is the encoding, storage, and retrieval, and the behavior is the actual speaking of the words at recall). The cognitive perspective has allowed psychologists to further explore the nature of more complex processes than list learning (e.g., piano performance, language acquisition), and has contributed to the development of the field of cognitive neuroscience because cognitive models of memory and other mental processes can be tested against the brain processes and structures that can now be seen through neuroimaging technology.

Although the nature of cognitive and behavioral perspectives are quite different and cognitivism has tended to dominate the study of learning since the 1960s, behaviorists are responsible for the rigorous methods associated with experimental psychology. It is these methods, pioneered by early behaviorists, that form the basis for the science of psychology.

Image: Ivan Petrovich Pavlov in his classical conditioning laboratory.

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