

What is the definition and an example of Carryover Effects?

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Carryover Effects refer to the influence that a previous treatment or condition has on subsequent ones, even after the initial treatment has ended. In other words, it is the lingering impact of a previous experience that affects future outcomes. An example of carryover effects can be seen in a study where a group of participants were given a placebo for a certain period of time and then switched to a new medication. Despite the change in treatment, the participants continued to experience the effects of the placebo, showing the carryover effect of the initial treatment. This phenomenon is important to consider in research studies as it can impact the validity of the results.

Carryover Effects: Definition & Example

A carryover effect is an effect that "carries over" from one experimental treatment to another.

This type of effect occurs most often in *within-subjects research designs* in which the same participants are exposed to each treatment condition.

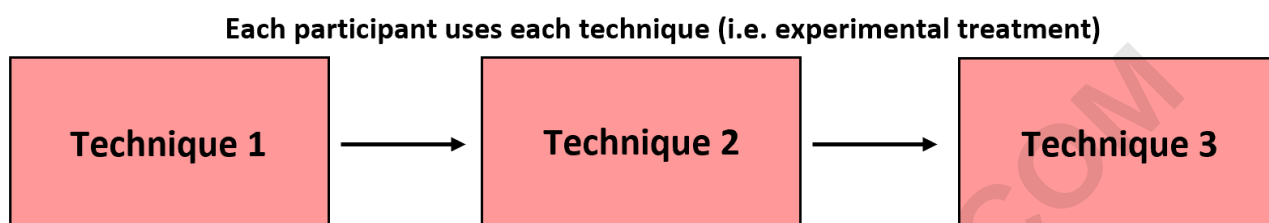
For example, suppose we recruit subjects to participate in an experiment in which they use three different techniques to memorize the order of cards in a deck.

Since each participant uses each technique, there's a good chance that they will improve their ability to memorize the cards simply due to practice rather than the actual technique they're using.

This is an example of a carryover effect - the increased ability of the participant to memorize cards "carries

over" to each subsequent technique.

The Carryover Effect



Is the participant improving because of practice or because of technique?

This type of effect is problematic because it makes it difficult to know whether or not the differences in performance between the experimental treatments is due to a carryover effect or the actual treatments.

For example, a participant might perform far better using technique 3, but is that because technique 3 is better or is it because the participant had time to practice and improve before using technique 3?

Types of Carryover Effects

There are two main types of carryover effects:

1. Practice Effect

A practice effect refers to a carryover effect in which the participant simply gets better at some task due to practice.

This means they're likely to show better results during later experimental treatments because they've had time to practice and improve.

2. Fatigue Effect

A fatigue effect refers to a carryover effect in which the participant gets worse at some task because they get fatigued from performing previous experimental treatments.

For example, it's possible that participants actually get worse at memorizing cards as they use more and more techniques because they simply get tired or mentally drained.

Types of Carryover Effects

Practice Effect

Participants perform better during later treatment conditions because they've had time to practice and improve.

Fatigue Effect

Participants perform worse during later treatment conditions because they're tired or fatigued from previous treatment conditions.

How to Minimize Carryover Effects

There are several ways to minimize carryover effects in an experiment, including:

1. Give participants time to warm up.

One way to prevent practice effects is to give participants time to warm up with the task to prevent them from getting better at the task *during* the actual experiment.

2. Make a task shorter.

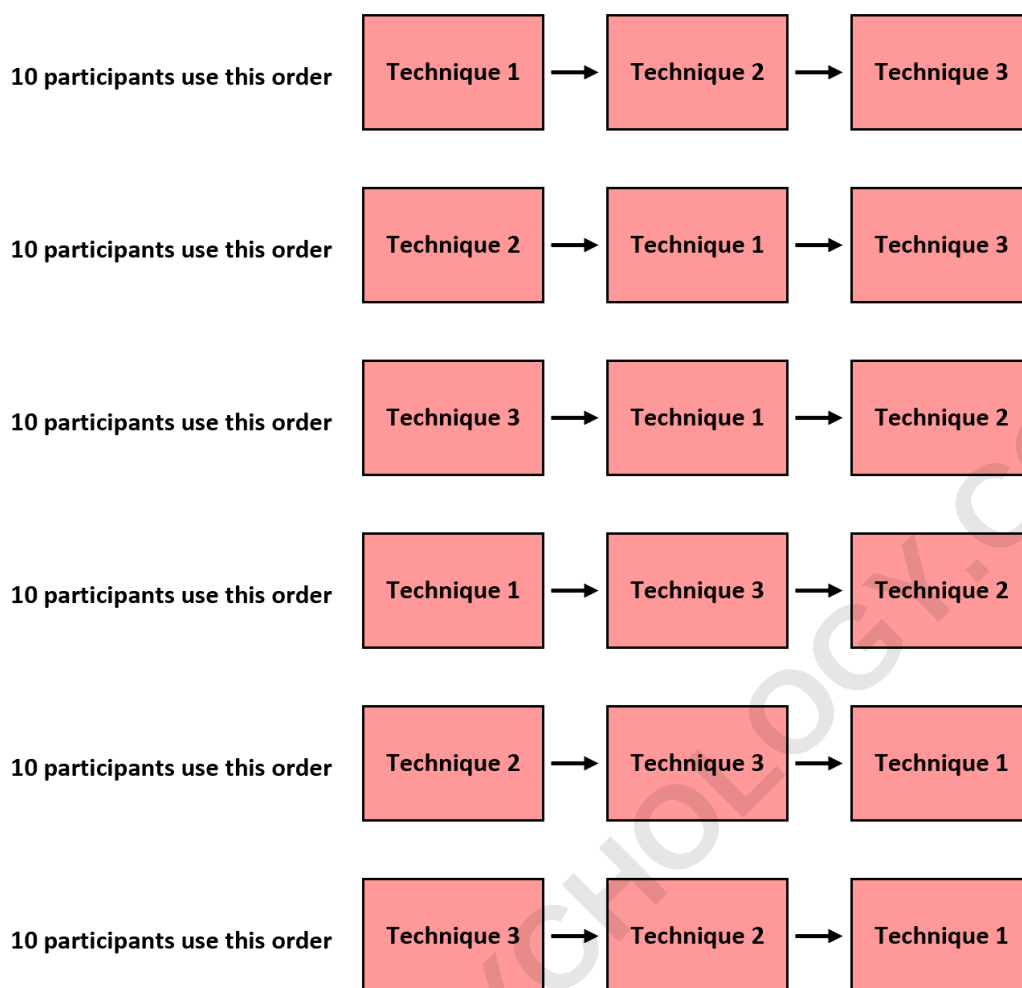
One way to prevent fatigue effects is to make a task shorter or less intense to perform. This makes it less

likely that the participants will get fatigued and tired as they perform more and more tasks.

3. Use counterbalancing.

Counterbalancing is when researchers assign experimental treatments in different orders to different participants.

For example, researchers might have 10 participants use three techniques in the order of 123, another 10 participants use the techniques in order of 213, another 10 participants use the techniques in order of 312, and so on.



By using each order the same number of times, we can "counterbalance" any order effects.

The downside of this method is that it can be too time-consuming or costly to actually implement every order an equal number of times.

The following tutorials provide an explanation for other common effects in experiments: