

Bias

by Sophia



WHAT'S COVERED

This tutorial will cover the topic of bias, specifically focusing on:

1. Bias

2. Hawthorne Effect

1. Bias

Most often, research is done accurately and with integrity. People want to get the job done right. They want to get the answer correct. But sometimes there's something that happens systematically in the experiment or the study that limits the accurate representation of the population being studied.

Bias, in the statistics world, is systematically misrepresenting the population. It refers to the favoring of certain outcomes in a sample that limits our ability to draw conclusions about the population. The key word is systematical—it's not necessarily intentional. It could be intentional, but it doesn't have to be.

A way of selecting the sample for your study such that the sample doesn't accurately reflect the population is called **selection bias**. It's not good, but sometimes it can't be avoided. On the other hand, sometimes it *can* be avoided, but isn't.

Publication bias occurs when researchers only want to publish the most sensational findings, or rather, only the positive ones. Only the results that people will want to read make it to people's eyeballs, while findings deemed boring do not.



TERMS TO KNOW

Bias

The tendency for collected data to differ from what is expected in a systematic way. Biased data can often favor a specific group of those studied.

Selection Bias

Selecting a sample in such a way that certain subsets of the population are systematically excluded.

Publication Bias

The desire of researchers (and research publications) to only print the most sensational or interesting articles.

2. Hawthorne Effect

Often, people will behave differently if they know that they're under observation. They become a bit self-conscious when they are observed and want to do it "right", so they act differently.

This idea that people might change what they would typically do based on the fact they're under observation is a type of bias called the **Hawthorne Effect**.

IN CONTEXT

Suppose you are in charge of a weight loss study. One group is told to take a pill every day. The other group is also told to take a pill every day, but it doesn't have any active ingredient in it.

You instruct them not to change their behavior. You don't want them changing the results by eating differently or exercising more. However, these people might change their behavior based on the fact that they know they're going to be weighed later.

Another thing to consider is when a study is based on participants volunteering their time to be a part of this study. What may happen is that only people with a passion specific to the study may sign up, which is known as **participation bias**.

Furthermore, another issue may be that the participants tell you what they *think* you want to hear, which is **response bias**.



TERMS TO KNOW

Hawthorne Effect

People have the tendency to change their behavior when they know they are being monitored.

Participation (Voluntary Response) Bias

Bias that occurs when a sample consists entirely of volunteers. People with strong opinions may be the only ones who volunteer.

Response Bias

Bias that occurs when a respondent tells the interviewer "what they want to hear" or lies due to the sensitive nature of the question.



SUMMARY

Bias has a problematic influence on many experiments and samples. Unfortunately, when bias exists, the results received cannot be generalized to the population, because they are not reliable. It's important to know that bias is not always intentional. It can be a systematic flaw in the sample or the experiment, but it's not always on purpose. Selection bias happens when the sample is not truly representative of the population to which you want to generalize the information. Publication bias is when researchers publish only the information that they think people want people to see. The Hawthorne Effect is a type of bias that happens when people act differently, just knowing they are being observed.

Good luck!

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