Section 3.2: Observational and Experimental Studies

In an <u>observational study</u>, the researcher merely observes what is happening or what has happened in the past and tries to draw conclusions based on those observations.

In an <u>experimental study</u>, the researcher manipulates (changes) one of the variables and tries to determine how that change influences other variables.

example: State whether the following studies are observational or experimental.

① Sixty patients with carpal tunnel syndrome are randomly divided into two groups. One group is given acupuncture and an exercise regimen. The other group is given only the exercise regimen. After one year, both groups are questioned about their level of pain due to carpal tunnel.

experimental, because researchers changed one of the variables and measured its effect

② Conservation researchers netted 250 large-mouth

bass (fish) in a lake and determined how many were carrying parasites.

observational, because researchers made a measurement without changing a variable beforehand

③ Coffee stations in offices often ask users to leave money in a tray to pay their coffee. Researchers at Newcastle University replaced the picture of flowers on the wall behind the coffee station with a picture of staring eyes. They found that the average contribution increased significantly above the well-established standard. *

experimental, because researchers changed the picture and then measured the effect

* this study's findings have not been replicated by a subsequent study

Confounding variables - two variables are confounded when their effects on a response variable cannot be distinguished from each other

actual
ᵛexample : students in the 10:30 section of
Math 191 are doing significantly
better than the 1:30 section

is it the time of day?

no, the Interurban math department believes
that the Civil students in the 1:30 section
have a higher workload in Fall than
the Mech students at 10:30.

(in winter, suddenly the 10:30 section
starts doing worse than the 1:30 section
because Mechs now have a heavier
workload)