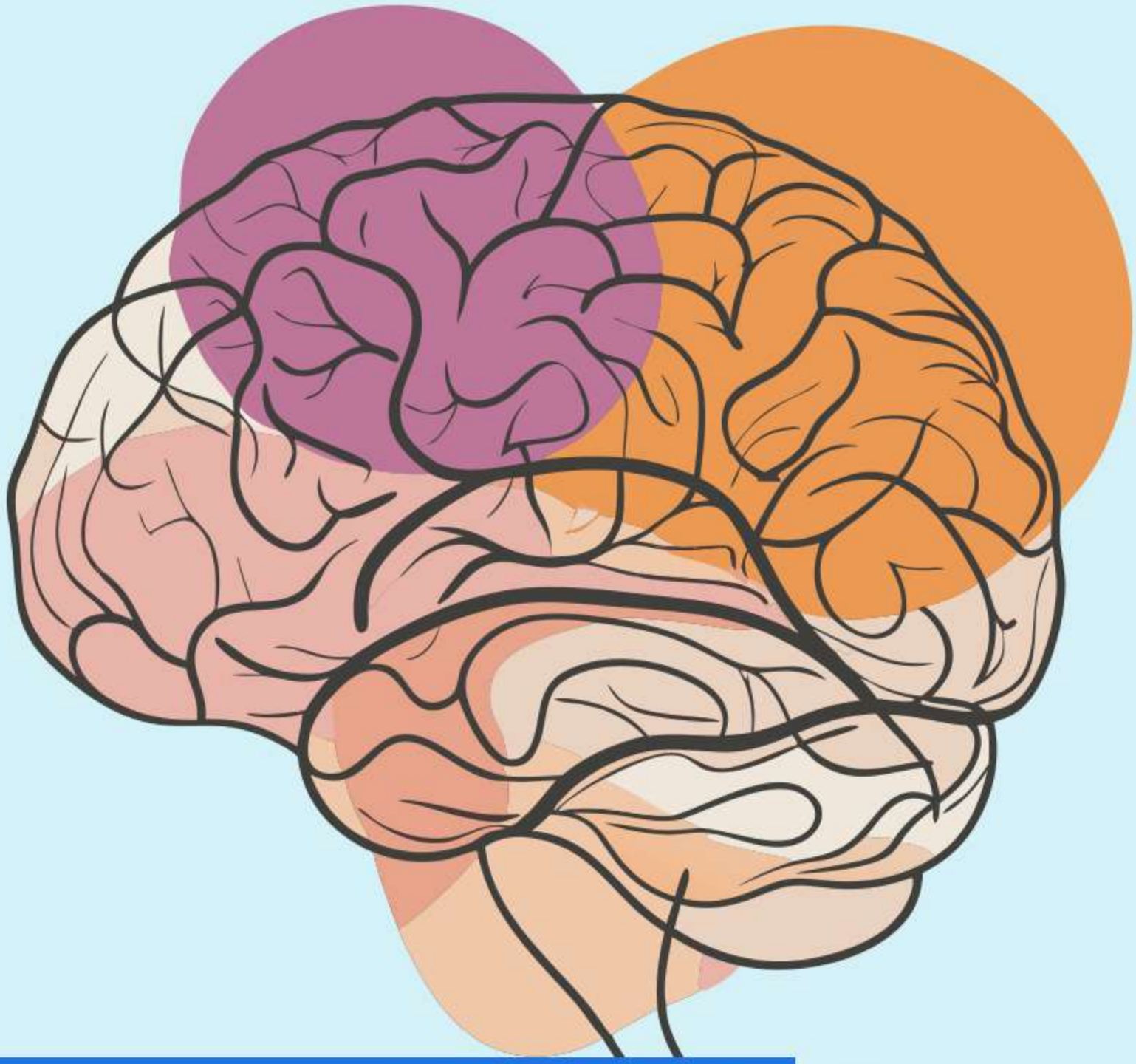
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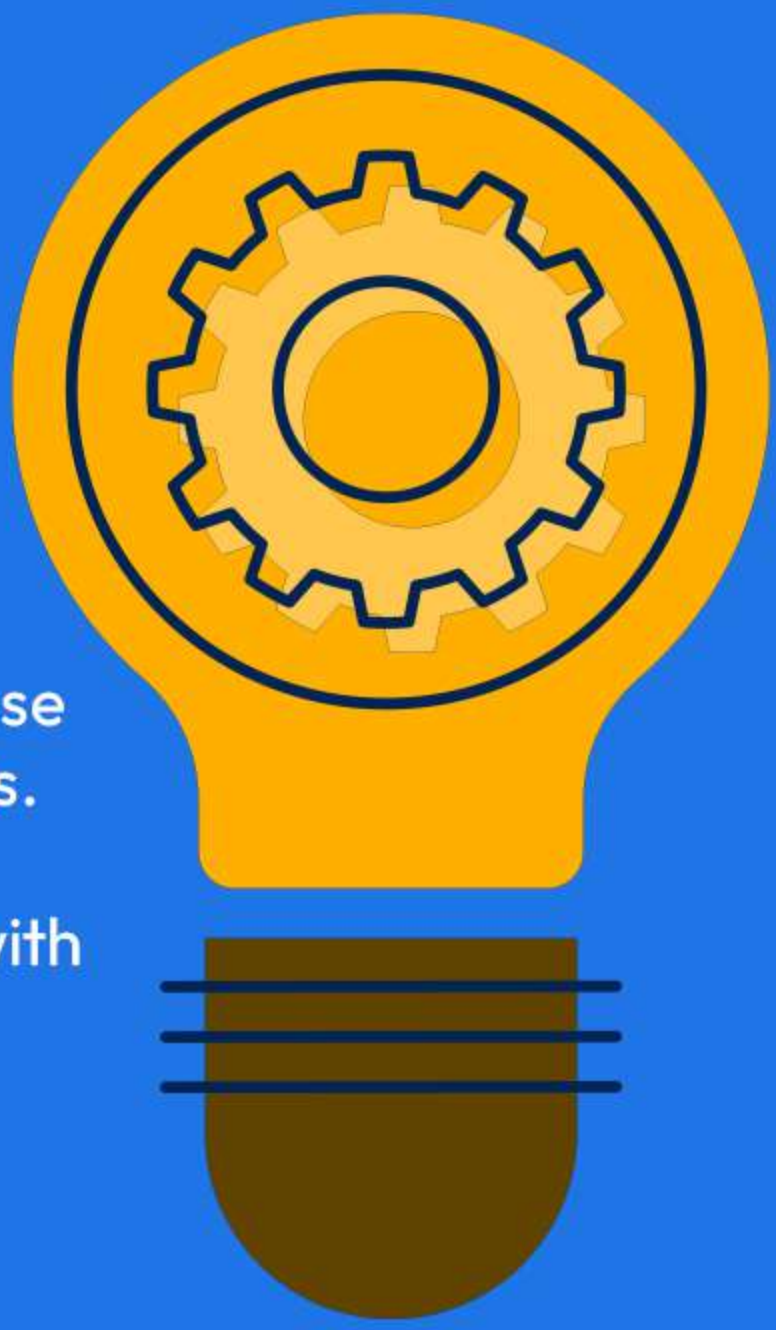
# NULL HYPOTHESIS & ALTERNATIVE HYPOTHESIS

The basic logic behind how psychologists test their research ideas

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# Why Do We Use Hypotheses in Research?



In psychology, researchers rarely study entire populations.

Instead, they collect sample data and use statistical inference to draw conclusions.

To do this logically, researchers begin with two competing statements:

- Null Hypothesis ($H_0$)
- Alternative Hypothesis ($H_1$ / Ha)

Statistical testing helps determine which statement is more consistent with the observed data.

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# What is the Null Hypothesis ($H_0$)?



The Null Hypothesis ($H_0$) states that:

- No relationship exists between variables, or
- No difference exists between groups

In simple terms, it assumes that any observed effect occurred purely by chance.

**Example:**

"Sleep duration has no effect on memory performance."

The null hypothesis is the starting assumption in statistical testing.

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# What is the Alternative Hypothesis ($H_1$ / Ha)?



The Alternative Hypothesis represents the researcher's prediction.

It states that:

- A relationship exists, or
- A difference exists between variables.

**Example:**

"Sleep duration affects memory performance."

If the data strongly contradict the null hypothesis, researchers support the alternative hypothesis.

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# Directional vs Non-Directional Hypotheses



Alternative hypotheses can be of two types:

## 1. Directional Hypothesis (One-tailed)

Predicts the direction of effect.



**Example:**

"More sleep improves memory performance."

## 2. Non-Directional Hypothesis (Two-tailed)

Predicts a difference but not the direction.



**Example:**

"Sleep duration affects memory performance."

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# Logic of Hypothesis Testing



Psychological statistics follows a specific logic:

1. Assume the Null Hypothesis is true.
2. Collect sample data.
3. Calculate a test statistic (t, z, F, etc.).
4. Determine whether results are statistically significant.

If the probability of the results under $H_0$ is very low, we reject the null hypothesis.

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# Rejecting vs Accepting the Null Hypothesis

Researchers never prove the alternative hypothesis.



Instead, they:

- Reject the null hypothesis, or
- Fail to reject the null hypothesis

Why?

Because statistics works with probability, not absolute certainty.

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