

Composing Hypotheses



This project is made possible by a grant from the U.S. Institute of Museum and Library Services.

Hypotheses

- Hypotheses generally focus on comparing, contrasting, or testing an idea or relationship.
- Hypotheses describe tentative expectations or assumptions about relationships between variables.
- Hypotheses seek to determine whether relationships between variables are statistically significant.
- Hypotheses should/can be based on theory (if available) or past studies.
- Hypotheses should be testable and reproducible.
- Hypotheses come in various types, but a basic hypotheses express relationships between two variables.
- Null hypotheses assert that there is no relationship between two variables; researchers seek to “nullify” the hypotheses.

Examples

- Alternate hypothesis: Students who participate in library instruction earn better assignment grades than students who do not participate in library instruction.
- (Null: Student participation in library instruction is unrelated to subsequent assignment grades.)
- Alternate hypothesis: The likelihood of faculty participation in open access publishing is increased by their possession of tenure/advanced academic rank.
- (Null: Faculty participation in open access publishing is not related to their possession of tenure/advanced academic rank.)
- Oftentimes, research investigates the null hypothesis. It is easier to prove it *untrue* than to definitely demonstrate that the alternate hypothesis *is* true.

Hypothesis Elements

- Who/what is being studied
- Variables involved
 - independent — researcher changes, manipulates, or controls (assumed cause, “if this”)
 - dependent — researcher observes or measures influence of the change in the independent variable (assumed effect, “then that”)
- Predicted relationship/outcome (often correlation)

Examples

Student participation in library instruction is unrelated to subsequent assignment grades. (null)

- who/what: students
- variables: library instruction, assignment grades
- relationship: unrelated

If undergraduate students do not study in library facilities, they will earn worse grades. (if, then)

- who/what: undergraduate students
- variables: study in library, assignment grades
- relationship: not studying in the library results in worse grades

It gets more complicated, of course.

Examples:

- Various variables:
 - Moderating variables — influence the effect of the independent variable on the dependent variable
 - Mediating variables — link and better explain the relationship between the independent and dependent variables
 - Control variables — variables that could influence the relationship but are not under examination in a particular investigation and are therefore held constant to better reveal the relationship between the independent and dependent variables
- Various kinds of hypotheses, with different numbers of variables, different directions of relationships, etc.

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