Composing Hypotheses

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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.