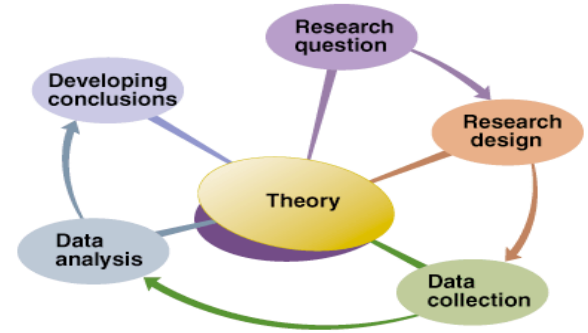
Variables, Relationships, Hypotheses
How to Build a Good Conceptual Model



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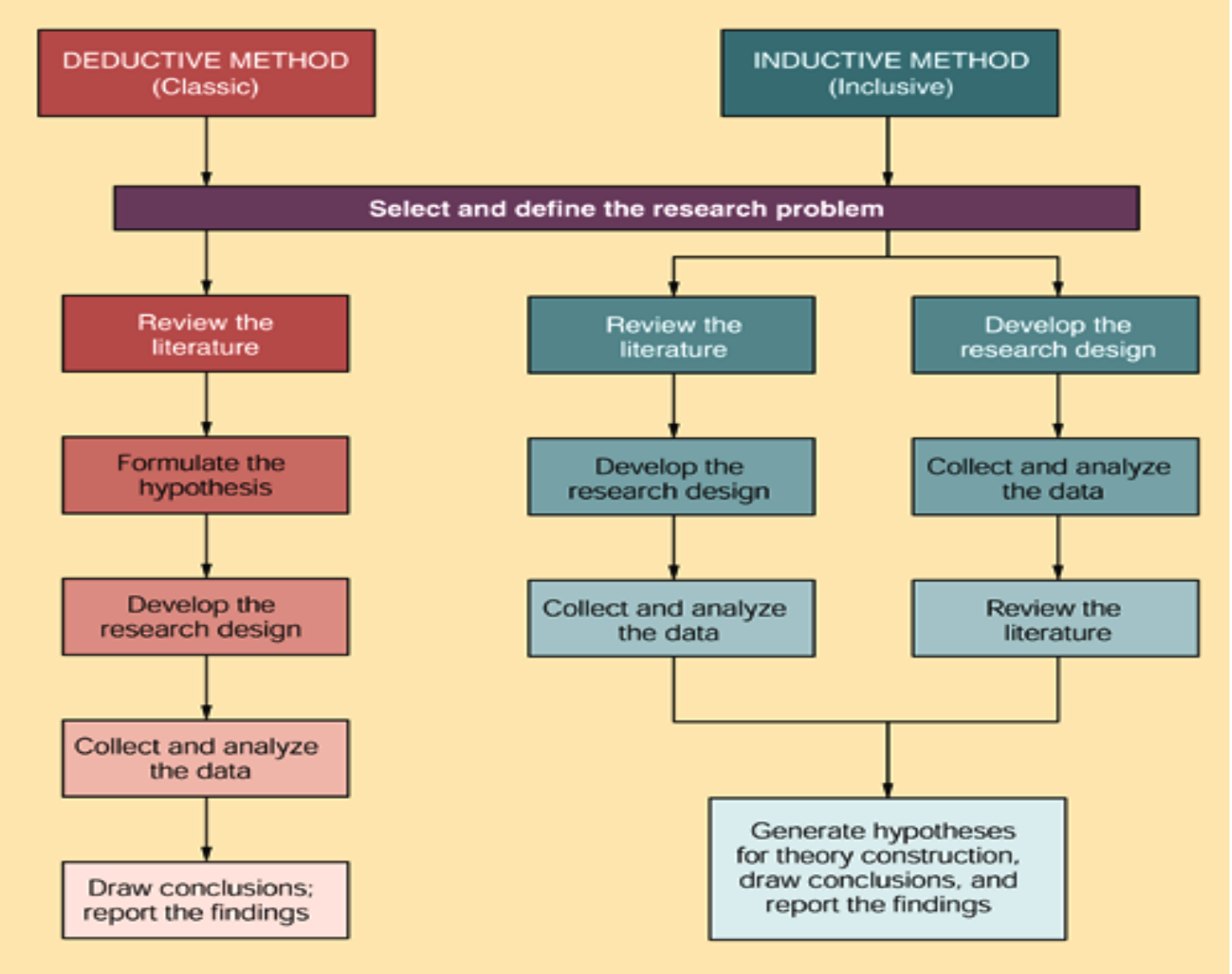
Induction and Deduction



Where Theory Fits In

What is a theory?

- Theory verses Ideology
- Theories
  - prevent “exceptions to the rule”
  - make sense of patterns
  - shape research
  - Theories are maps of reality. The truth they depict may be objective facts “out there” or subjective meanings inside our heads.
- A theory is a statement about how reality works (Einstein)
- A theory is a systematic explanation for the observed facts and laws that relate to a particular aspect of life (Babbie)

Good theory provides…

- An explanation of the data
- Prediction of future events
- Relative simplicity (parsimony)
- Hypotheses that can be tested
- Practical utility

What makes a good research question?

- Is the question or problem stated in a solvable way?
- Is the question open and non-biasing?
- How important/relevant is the question?
- Does the research answer the question?
- Are definitions misused as explanations, circular, or inadequately specific?
- Are conceptual definitions operationalized?

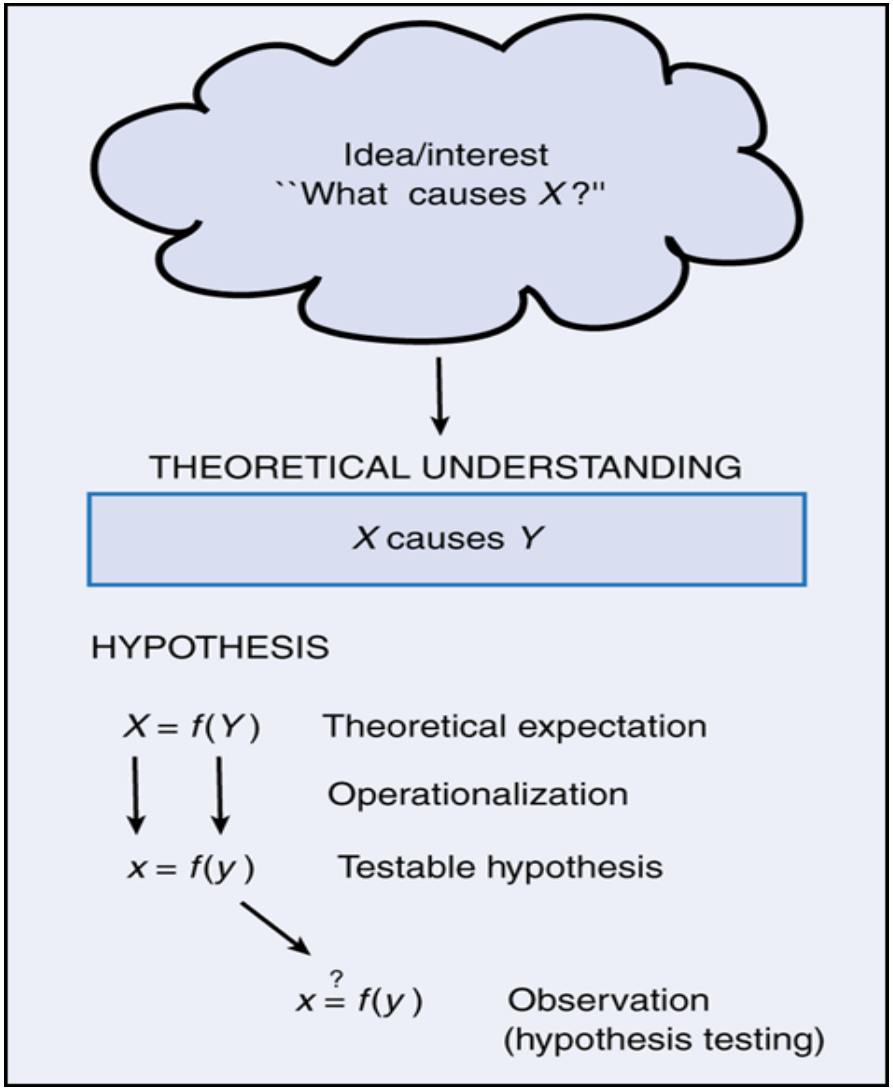
Putting Theory into a Conceptual Model

- Concept: Abstract elements representing classes of phenomena with the field of study.
- Variables: Concepts stated in measurable terms (more specific than concepts).
- Statements: Principles, laws, axioms, propositions and hypotheses in theory building.
- Postulates lead to propositions
- Propositions lead to hypotheses

Examples

- Concept: The role of gender in communication.
- Variable: verbal arguments made by women and men in public speaking.
- Statement: Women have more hedges and qualifiers in their verbal arguments in public speaking than do men (a hypothesis).

From Theory to Hypothesis



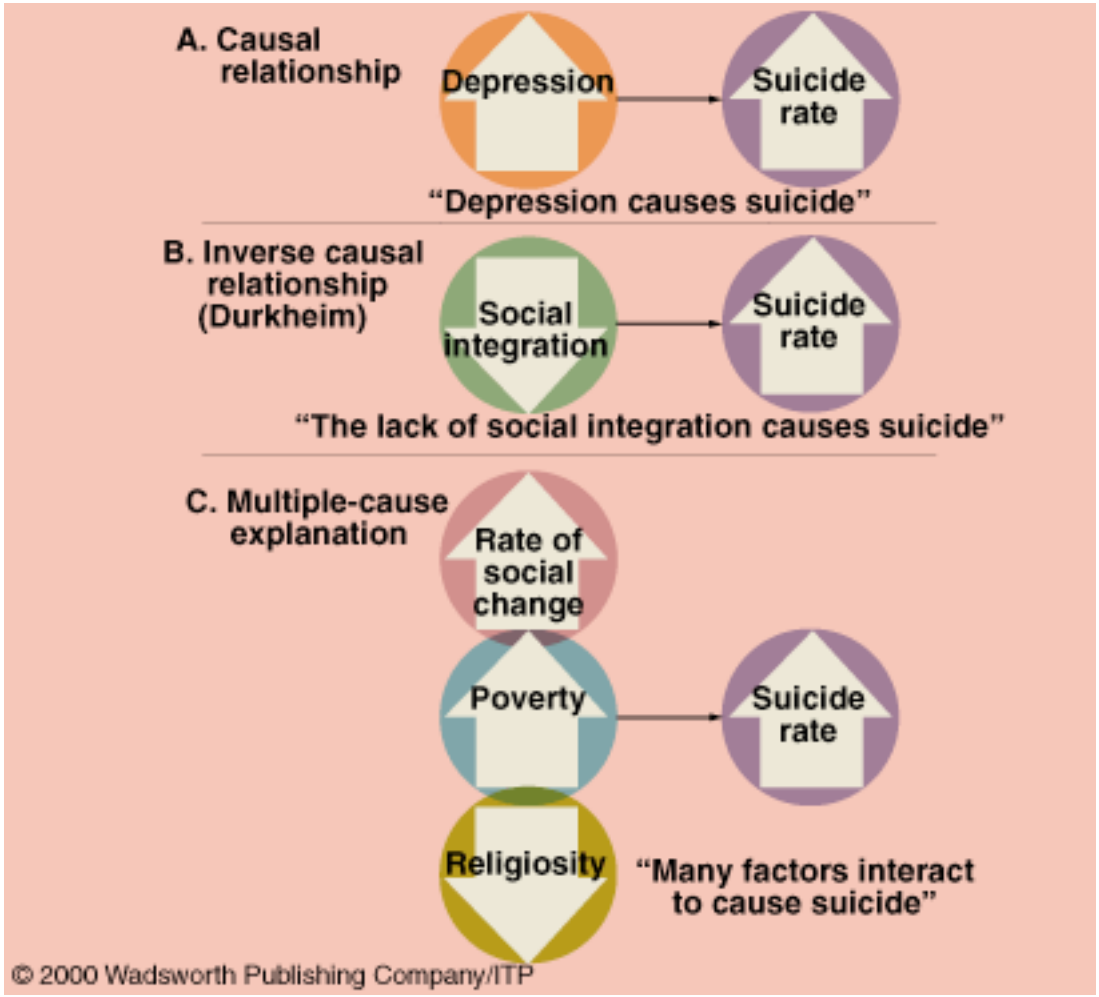
Causes and Common Knowledge

- Going to college causes people to be smarter
- Old age leads to senility
- More frequent testing of students makes schools more accountable for results and leads to greater student learning
- Tax breaks for corporations stimulate job creation and lower unemployment
- Left-handed people lead shorter lives

Causal Relationships and Hypotheses

- Criteria for causality
  - Association
  - Temporal priority
  - No spurious variables
  - All three criteria must be met
- Hypotheses
  - At least two variables
  - Expresses a causal relationship
  - Expressed as a prediction
  - Logically linked to theory and a research question
  - Is testable, i.e., with empirical evidence

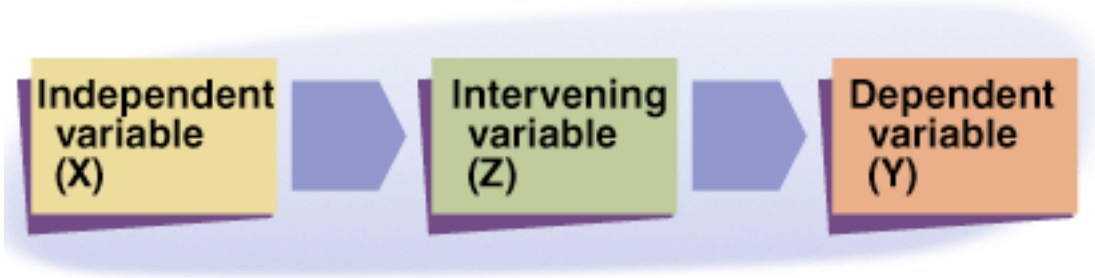
Types of Causal Relationships



Stating Causal Relationships

- Family breakups **cause** delinquency
- Family breakups **lead to** delinquency
- Family breakups **are related** to delinquency
- Family breakups **influence** delinquency
- Family breakups **are associated with** delinquency
- Family breakups **produce** delinquency
- Family breakups **result** in delinquency
- The **higher the level** of family breakups the **higher the level** of delinquency
- Family breakups **increase the likelihood of** delinquency

The Priority of Variables



Types of Hypotheses

- The Null Hypothesis predicts no relationship
- The Research or Alternative Hypothesis predicts a relationship
- We say that we can “reject the null” (reject) or “fail to reject the null” (accept)
- We DON’T say “we can adopt the research hypothesis”
- Hypotheses are either accepted or rejected – they are not “partially” accepted or rejected

Evaluating Relationships

Issues in Relationships

- "third" variables or spurious relationships
- crossing levels of analysis/measurement
- freedom to vary
- causality

Issues to Consider

- Is the analysis based on a single variable?
- Are important "third" variables missing?
- Is the level of relationship measurement the same as level of hypothesis/conclusion?
- Are variables indeed free to vary?
- Are causal relationships stated or implied? If so, are they defensible?

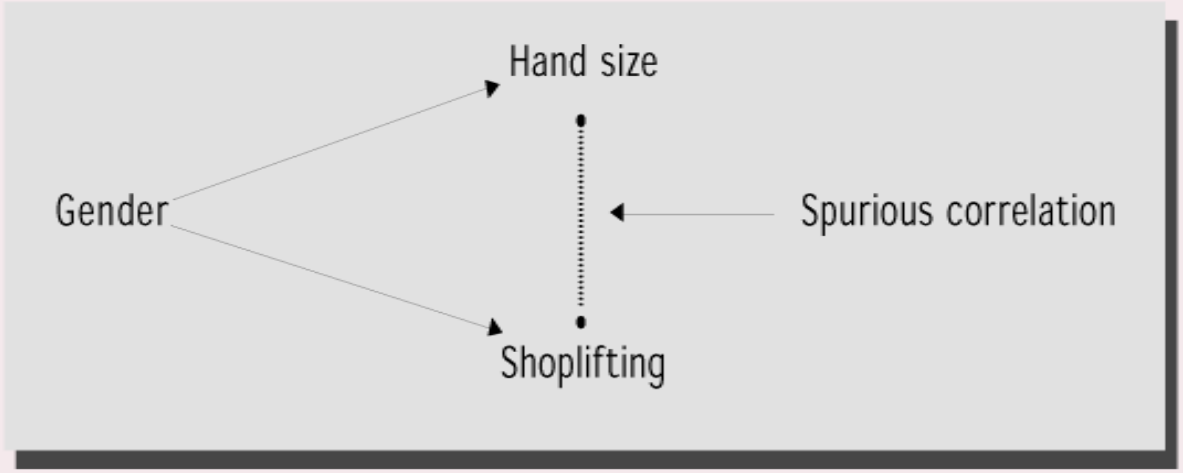
Logical Errors in Causal Explanation

- Tautology
- Teleology
- Spuriousness (Questionable Cause)
- Provincialism
- Hasty Conclusion

A Spurious Relationship

FIGURE 3-1

Diagram of a Spurious Correlation.



Hand size is correlated with shoplifting only because each is related to gender. Within each gender there is no such correlation. A correlation like this is known as a spurious correlation.