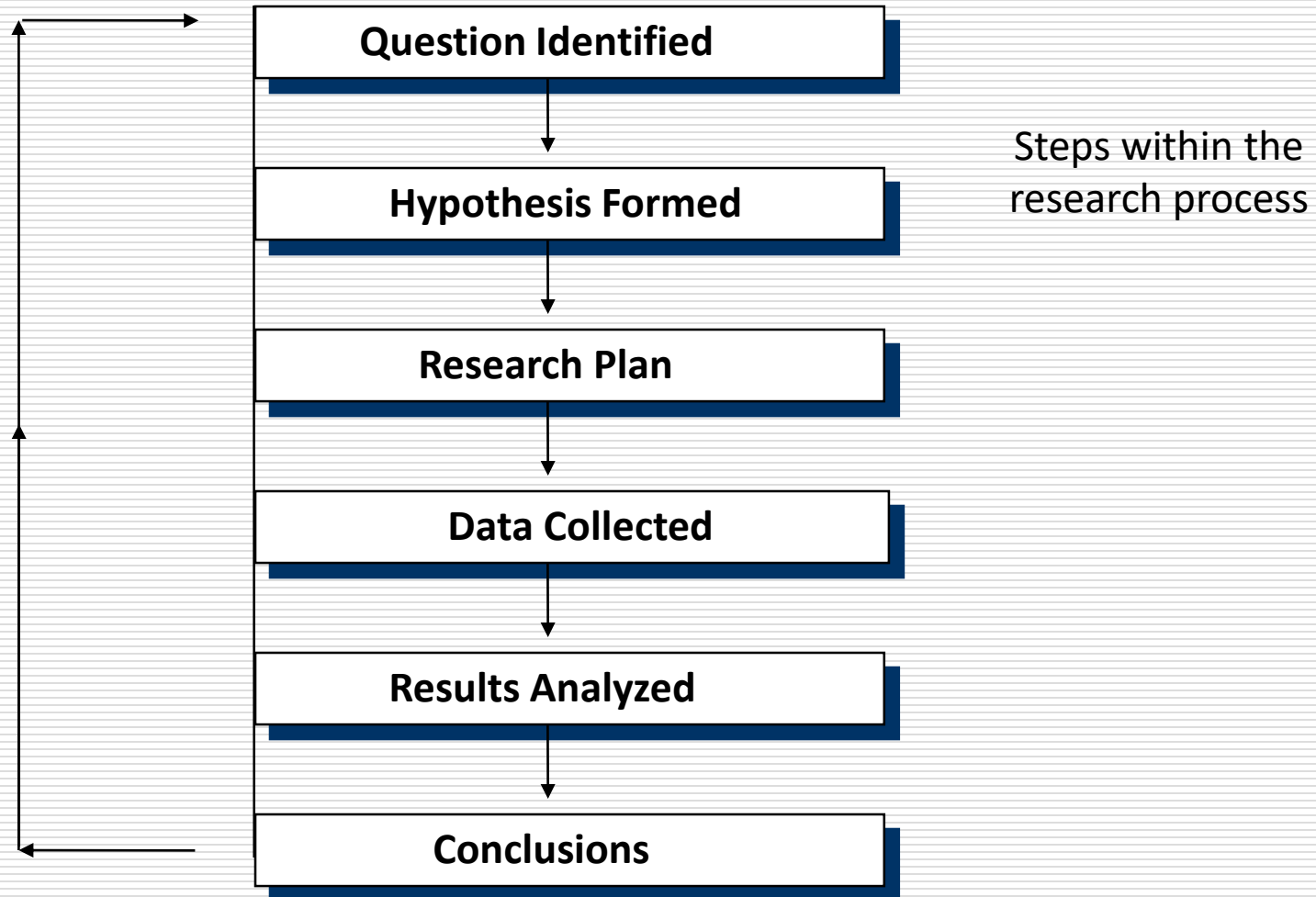

Understanding the Research Process

Stages of the Scientific Method



Steps in Conducting Research

- ◆ Specific steps guide the research process
- ◆ Number of steps is indeterminate
- ◆ Various steps may be combined
- ◆ Order of steps may vary somewhat
- ◆ Importance of specific steps is variable
- ◆ “12 Steps of Research”

“12 Steps of Research”

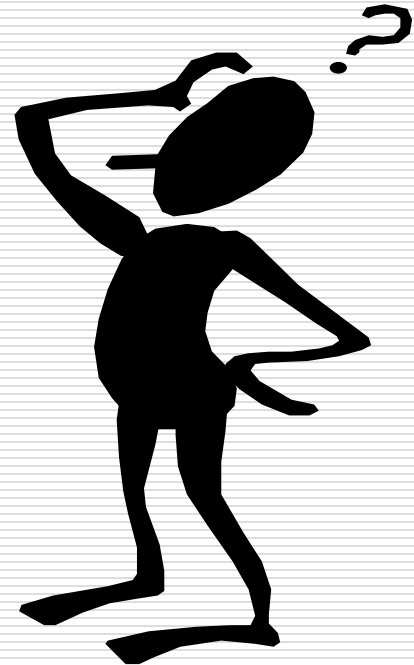
1. Identify the research question
2. Initial review of literature
3. Distilling the question to a researchable problem
4. Continued review of literature
5. Formulation of hypothesis
6. Determining the basic research approach

“12 Steps of Research”

7. Identifying the population and sample
8. Designing the data collection plan
9. Selecting or developing data collection instruments
10. Choosing the method of data analysis
11. Implementing the research plan
12. Interpreting the results

The Research Question

- ◆ The foundation of the research process
- ◆ It all begins with a question



Finding a Research Question

◆ From where ????????

- Curiosity
- Information Gaps
- Controversy
- Replication
- Literature Review
- Other People
- ...???



Types of Research Questions

- ◆ Conceptualize that a research study can ask three types of questions:
 - Descriptive question
 - Relationship question
 - Difference question
- ◆ This general classification scheme helps not only with the design of the study, but also in choosing the type of data analysis procedure

Descriptive Question

- ◆ Seeks to describe phenomena or characteristics of a particular group of subjects being studied
 - Answers the question “what is”
 - Asking questions of the research participants
 - Testing or measuring their performance
 - Survey research

- ◆ Example
 - What are the attitudes of rural parents toward the inclusion of sexuality education in the school curriculum? (Welshimer & Harris, 1994)

Relationship Question

- ◆ Investigates the degree to which two or more variables are associated with each other
 - Does not establish “cause-and-effect”
 - Only identifies extent of relationship between variables
- ◆ Example
 - Is there an association between self-esteem and eating behaviors among collegiate female swimmers? (Fey, 1998)

Difference Question

- ◆ Seeks to make comparisons between or within groups of interest
 - Often associated with experimental research
 - Is there a difference between the control group and the experimental group?
 - Comparison of one group to another on the basis of existing characteristics

- ◆ Example
 - Does participation in Special Olympics affect the self-esteem of adults with mental retardation? (Major, 1998)

Criteria for Selecting a Problem

◆ Interest

- Most important

◆ Significance

- Theoretical value
- Practical value
- Timeliness
- External review

Criteria for Selecting a Problem

◆ Manageability

- Expertise, time, resources
- Free from personal bias

Problem Distillation

- ◆ The process of refining the question or idea into a problem and making it sufficiently specific so that it is amenable to investigation
- ◆ This process should lead to the development of a “statement of the problem” that is clear, concise, and definitive

Statement of the Problem

- ◆ A very specific statement which clearly identifies the problem being studied; will usually identify the key variables as well as give some information about the scope of the study
- ◆ May be in either question or declarative form
- ◆ May include inherent sub-problems, if appropriate
- ◆ Formulation of problem statement takes place after an initial review of related literature and the distillation process

Problem Statements

- ◆ “The problem of this study was to ...”
- ◆ “This study was concerned with ...”
- ◆ “This study is designed to ...”
- ◆ “The purpose of this investigation is to ...”

Sample Problem Statements

1. The problem was to investigate the effects of exercise on blood lipids among college-age females.
2. This study was designed to determine the relationship between stability performance and physical growth characteristics of preschool children.
3. The present study was designed to identify those characteristics which differentiate between students who binge drink and those that do not.
4. The problem of the study was to determine is there is a relationship between self-efficacy and self-reported alcohol usage among middle-aged adult females.

Delimitations

- ◆ Delimitations define the scope of the study. That is, they set the boundaries of the study
- ◆ Normally under control of the researcher
- ◆ Examples include
 - number and kinds of subjects
 - treatment conditions
 - tests, measures, instruments used
 - type of equipment
 - location, environmental setting
 - type of training (time and duration)

Limitations

- ◆ Limitations are very similar to delimitations, but they tend to focus on potential weaknesses of the study
- ◆ Examples include
 - sampling problems (representativeness of subjects)
 - uncontrolled factors and extraneous variables
 - faulty research design and techniques
 - reliability and validity of measuring instruments
 - compromises to internal/external validity

Limitations continued

- ◆ Possible shortcomings of the study . . . usually cannot be controlled by the researcher
 - the researcher will, of course, try to eliminate extremely serious weaknesses before the study is commenced
- ◆ May be a result of assumptions not being met
- ◆ No study is perfect; the researcher recognizes the weaknesses

Assumptions

- ◆ Assumptions are basic, fundamental conditions that must exist in order for the research to proceed
- ◆ Basic premises required in the study... the researcher does everything possible to increase the credibility of the assumptions, but does not have absolute control
- ◆ Assumptions could be made about (1) the motivation of the subjects, (2) whether subjects responded truthfully, (3) the validity of the measuring instrument, and (4) whether subjects followed directions correctly

Concept of Variables

- ◆ A variable is a characteristic, trait, or attribute of a person or thing that can be classified or measured
 - Attitude
 - Gender
 - Heart rate
 - Hair color
- ◆ Variable - the condition or characteristic which in a given study may have more than one value

Classification of Variables

- ◆ Quantitative – measured numerically
 - Discrete
 - Continuous
- ◆ Qualitative – categorical in nature

Independent Variable

- ◆ A variable that is presumed to influence another variable; the variable under study or the one that the researcher manipulates
- ◆ Two types
 - Active – variable is actually manipulated
 - Attribute – cannot be manipulated because it is preexisting trait; sometimes called a “categorical” variable (e.g., race, gender)

Dependent Variable

- ◆ The variable that is expected to change as a result of the manipulation of the independent variable; that which is measured in a study

Extraneous Variable

- ◆ A variable that could contribute some type of error in a research study
- ◆ Also referred to as . . .
 - Confounding variable
 - Intervening variable
 - Modifying variable
- ◆ Error-producing variable that the researcher should attempt to eliminate or control
- ◆ May affect the relationship between the independent variable and the dependent variable if not adequately controlled

Controlling Extraneous Variables

- ◆ Excluding the variable
- ◆ Random selection of research participants
- ◆ Matching cases according to some criterion