I. PROCESS OF RESEARCH
5 steps in research process:

1. Identifying problem
2. Developing objective/hypothesis
3. Data collection
4. Data analysis
5. Report writing
Research begins with a problem.
- This problem need not be Earth-shaking.
- Identifying this problem can actually be the hardest part of research.
- In general, good research projects should:
  - Address an important question.
  - Advance knowledge.

II. ETHICS OF RESEARCH

WHAT IS ETHICS?

As a set of rules by which individuals and societies maintain moral standards in their lives.
ETHICS IN RESEARCH

- Research ethics’ refer to the moral principle guiding research, from its inception through to completion and publication of results and beyond - e.g. the curation of data and physical samples after the research has been published

The Economic and Social Research (2009)

Ethical Conduct

The ethical conduct of research is essential for those working in all disciplines, but particularly for researchers in medicine and life sciences.

An unethical approach can invalidate findings, lead to prosecution and damage the image of the research community within the public realm as a whole.

Taken from Higher Education and Research Opportunities (HERO)

Institutional Review Board (IRB)

- Every institution where an individual might conduct research must have an IRB
  - Most school districts have some types as well as Universities
- Primary goal is to protect the rights of research participants
  - Some consider a goal to be to maintain integrity of research conducted through the institution
- Government reviews IRBs and if finds problems will order cease and desist
  - All research must be halted until further notice (exceptions are made for studies that would be harmful to abruptly stop)
Consent

**Informed consent**
- Subjects must know potential risks, benefits, conditions of participation, and ability to withdraw without penalty
- If consent is not informed, it can be as bad as (or worse than) not getting consent at all

**Two types**
- Direct or Substitute (3rd party)
- If the person has a legal guardian, need substitute

**When in doubt, ask for permission**
- Consent should always be obtained in writing

Elements of Consent

**Capacity**
- Ability: individual is competent enough to understand, evaluate, and make a decision of whether to participate or not
- Age: > 18 or emancipated minor

**Information**
- Is it complete/comprehensive and fully understood?

**Voluntariness**
- Subjects have the choice to participate or withdraw and are aware of this choice
Harm

- Subjects must be protected from harm, or at the least fully informed about the potential costs and benefits resulting from the harm.
- Research that is physically or psychologically dangerous is generally considered unethical.
- Care needs to be taken with subjects who are, or consider themselves to be, relatively powerless.
  - Children, elderly, w/ disabilities

Harm (cont)

- There is no prespecified level for the unethical threshold of harm (e.g., 36 degrees or 12 pounds).
- Consideration is in the cost/benefit ratio.
  - In general, make sure the benefits (from the study) outweigh the costs (to individual participants).

Privacy

- Sensitivity of topic &/or data
  - Can responses/results affect the subject’s life if known by others?
- How public/private is the setting?
- Public display of the data
  - Personally identifiable information should be removed or changed.
Deception

- Often tied to the informed part of consent
  - Omission: withhold information
  - Commission: provide false information
    - i.e., lying
  - Establishing false intimacy: subject feels a high degree of comfort because he/she does not know is “on the record”
  - Using accomplices: someone helping the researcher that the subject doesn’t know is helping

Deception (cont)

- Sometimes a degree of deception is necessary
  - IRB needs to regulate
  - When it is, subjects MUST be debriefed after the study
    - Dehoaxing: researcher convinces (tells) each subject who was deceived that they were, in fact, deceived
    - Desensitization: a systematic process of demonstrating that there was deception
      - Suggest that behavior was a result of the circumstances
      - Point out that subjects’ behavior was not abnormal or unusual

III. CONCEPT OF SCIENCE
WHAT IS SCIENCE?

- **Science** is both a process of gaining knowledge, and the organized body of knowledge gained by this process.

- The **scientific process** is the systematic acquisition of new knowledge about a system.

- This systematic acquisition is generally the scientific method, and the system is generally nature.

- Science is also the **scientific knowledge** that has been systematically acquired by this **scientific process**.

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Science is also an approach for the generation of knowledge. It relies on a mixture of empiricism (i.e., the collection of data) and rationalism (i.e., the use of reasoning and theory construction and testing).

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**Characteristics of Science**

- Science is progressive.
- Science is rational.
- Science is creative.
- Science is dynamic.
- Science is open.
- Science is "Critical."
- Science is never-ending.
IV. GOALS OF SCIENCE

- Account for (explain) behaviors or events
- Predict (and ultimately control) future occurrences and outcomes

Hierarchy in Science

- Finding facts
- Developing laws
- Establishing theories
V. LOGIC OF SCIENTIFIC REASONING

Scientific method → 2 reasoning process:

- Inductive reasoning (Bottom-up)
- Deductive reasoning (Top-bottom)
**Inductive & Deductive Reasoning Processes**

**INDUCTIVE**

- Observation
- Pattern
- Tentative hypothesis
- Hypothesis
- Generalization
- Theory

**DEDUCTIVE**

- Observation
- Pattern
- Hypothesis
- Tentative hypothesis
- Theory

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**Inductive reasoning**

- Research is designed to identify components that can eventually lead to generalizations.

- Begins with empirical observations then infers constructs.
**Deductive reasoning**

- Generalization is stated and the specifics are sought to support the generalizations.

Using constructs as a basis for making predictions about new observations.

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**VI. Approaches to Science**

- Positivist
- Interpretive
- Critical
Positivist

Positivists generally assume that reality is objectively given. Reality can be described by measurable properties which are independent of researches and their instruments. Positivist studies generally attempt to test theory, in an attempt to increase the predictive understanding of phenomena.

Orlikowski & Baroudi (1991) classified research as positivist if there was evidence of formal propositions, quantifiable measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population.

Interpretive

- Interpretivists assume knowledge is socially constructed through language, consciousness and shared meanings.
- Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense making as the situation emerges.
- Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them.
Interpretive methods of research are “aimed at producing an understanding of the context of the social system, and the process whereby the system influences and is influenced by the context”. (Walsham, 1993)

Critical researchers assume that social reality is historically constituted and that it is produced and reproduced by people.

- People’s ability to change their social and economic circumstances, are constrained by forms of social, cultural and political domination.
- The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light.

Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipatory i.e. it should help to eliminate the causes of alienation and domination.
INTERACTIVE QUIZ 1: T/F?

1. An inductive researcher would start his research with an observation. T/F?

2. A deductive researcher would start his research with a theory. T/F?