

**RESEARCH AS
SCIENTIFIC
METHOD**

QUALITATIVE VS QUANTATIVE



Overall Purpose

■ Qualitative

Explain, gain insight and understanding of, phenomena through intensive collection of narrative data

■ Quantitative

Explain, predict, and or control phenomena through focused collection of numerical data



Hypothesis

■ Qualitative

Tentative, evolving, and based on particular study

■ Quantitative

Specific, testable, and stated prior to particular study



Review of Related Literature

■ Qualitative

Limited, does not significantly affect particular study

■ Quantitative

Extensive, does significantly affect particular study



Research Setting

- Qualitative

Naturalistic (as is) to the degree possible

Natural setting refers to the fact that the variables being investigated are studied where they naturally occur, as they naturally occurred, not in researcher controlled environment under researcher controlled condition, as is the case with quantitative studies.

- Quantitative

Controlled to the degree possible



Approach to inquiry

■ Qualitative

Inductive, subjective,
holistic, process
oriented

■ Quantitative

Deductive, objective,
outcome oriented



Sampling

■ Qualitative

Purposive: Intent to select “small,” not necessarily representative, sample in order to acquire in-depth understanding

■ Quantitative

Random: Intent to select “large,” representative sample in order to generalize results to population



Measurement

- Qualitative

- Nonstandardized,
narrative, ongoing

- Quantitative

- Standardized,
numerical, at the end



Design and Method

■ Qualitative

- Flexible, specified only in general terms in advance of study.
- Involve nonintervention, minimal disturbance.
- Historical
- Ethnographic
- Case study

■ Quantitative

- Structure, inflexible, specified in detail in advance of study
- Involve intervention, manipulation, and control
- Descriptive
- Correlational
- Causal-comparative
- Experimental



Data Collection Strategies

Qualitative

- Document collection
- Participation observation
- Unstructured, informal interviews
- Taking of extensive, detailed fieldnotes

Quantitative

- Nonparticipant observation
- Semistructured, formal interviews
- Administration of tests and questionnaires



Data Analysis

Qualitative

- Raw data are words
- Essentially ongoing, involves synthesis

Synthesis: The process or result of building up separate elements especially ideas, into a connected whole, especially into a theory or system

Quantitative

- Raw data are numbers
- Performed at the end of study, involves statistics



Data Interpretation

■ Qualitative

- Conclusion tentative, reviewed on an ongoing basis, generalizations speculative or nonexistent
- Transferable

Quantitative

Conclusions and generalizations formulated at the end of study, stated with predetermined degree of certainty



Trends

- More-structured qualitative research
- Increased application of both inquiry strategies in same study



Qualitative Analysis

- In a simplified nutshell, qualitative analysis involves making sense out of an enormous amount of narrative data. Given a “bunch” of fieldnotes, transcripts, documents, and so forth, the question is what do they SAY?



Qualitative Analysis

- Thus, the qualitative researcher looks for categories, patterns, themes which will facilitate a coherent synthesis of the data. This synthesis including relevant illustrative examples and quotations, eventually represents the researcher's overall understanding of what the data mean.

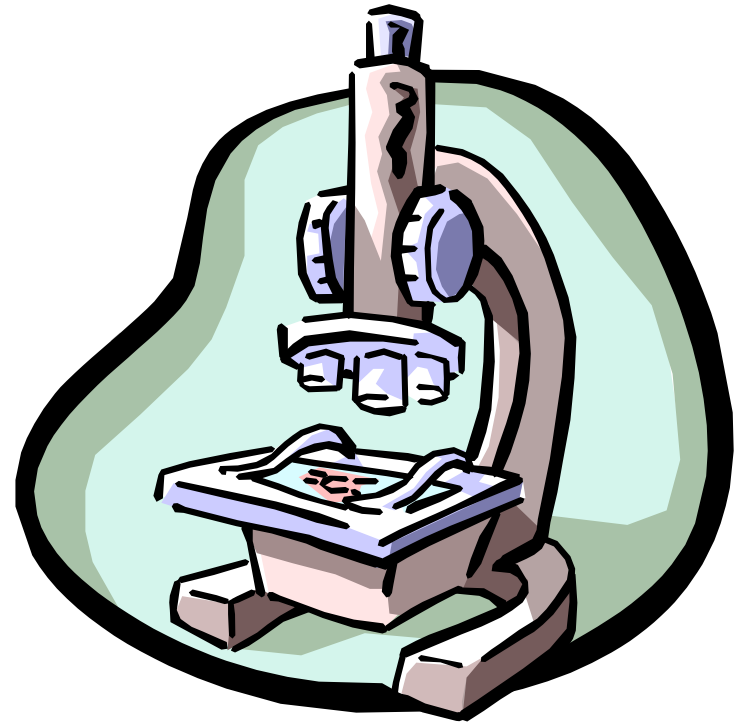


**Every human knowledge
is not science**



Science is a method

- A procedure to produce knowledge i.e. discovering uniformities/ principles, laws in this universe.



Process of “sensory experiences”

- **Observation → Repetition → Re-observation.**
- **By repeating the observation researchers want to be definite/positive.**
- **This approach is called positivism**



**Results are organized,
systematized, and made
part of the body of
knowledge.**



Special Features of Scientific Method



1. Empirical

Observable phenomenon

2. Verifiable

Use senses to confirm or refute the observation. “Sensory experiences.” Intuitions and revelations are out. Replicability needed.



2. Verifiable

Use senses to confirm or refute the observation. “Sensory experiences.” Intuitions and revelations are out. Replicability needed.



3. Cumulative

Knowledge grows. Need not start from scratch.

4. Deterministic

Explains why things happen?

Parsimony → Minimum No. of variables that explain variance.



5. Ethical and ideological neutrality

**Value free. Objectivity. Is it
possible?**



6. Statistical generalization

**Subjecting information to
statistical analysis.**

**(Statistics is a device for
comparing what is observed and
what is logically expected).**



7. Rationalism

Employ rigorous rules of logic.

Argumentation.



**All features are
interrelated.**

***Scientists not necessarily adhere
to all these characteristics.***



Two power bases of knowledge

- **Empiricism: Sensory experience → positivism.**
- **Rationalism: Explanation for regularity. Consequential arguments. Logical.**



**Any body following the
said procedure of
research is doing
scientific research.**



**Logical positivism i.e.
theory + observation +
statistics**



CLASSIFICATION OF RESEARCH



Four main dimensions:

1. Purpose of doing research.
2. Intended uses of research.
3. How it treats time → time dimension.
4. The research techniques used



1. Purpose of Research

What the researcher trying to accomplish.

a. Exploratory/Formulative

b. Descriptive

c. Explanatory

Studies can be multipurpose



Goals of Exploratory Research

- **Become familiar with the topic. Develop well grounded picture of the situation.**
- **Develop tentative theories.**
- **Determine the feasibility of study.**
- **Formulate questions and refine issues for more systematic inquiry.**
- **Develop techniques and a sense of direction for future research**



b. Descriptive Research

- **Research designed to describe characteristics of the phenomenon under study.**
- **Helps in diagnostic analysis**
- **Specific goals can be:**



Goals of Descriptive Research

- **Describe the situation/characteristics. Provide an accurate profile of a group.**
- **Give a verbal or numerical picture (%).**
- **Present basic background information.**
- **Create a set of categories or classify.**
- **Clarify sequence, set of stages.**
- **Focus on 'who', 'what', 'when', 'where' and 'how' but not on 'why'.**



c. Explanatory Research

- Also called as causal research i.e.
- ‘Why’? Explanation.
- Identify cause and effect relationship among different factors.



Goals of Explanatory Research

- **Explain things not just reporting. Why?**
- **Which explanation is better.**
- **Determine the accuracy of theory.**
- **Advance knowledge about underlying processes**
- **Build and elaborate a theory → complete.**
- **Extend a theory or principle into new areas.**
- **Provide evidence to support or refute an explanation or prediction.**



2. The Uses of Research

- **a. Basic Research**
- Pure/fundamental/academic
- Developing/refuting/supporting theories. Expand knowledge.
- Explanatory research is the most common
- Applied can also contribute.



b. Applied Research

- **Solve specific problems → help practitioners. Market new product.**
- **Choose one policy over the other.**
- **For improving productivity → problem with machines, raw material, persons working.**



Basic and applied research compared

Basic

- Intrinsically satisfying
- Freedom.
- Hi standards applied.
- Logic and rigorous research design
- Basic knowledge.
- Success → results published, impact on other scientists.

Applied

- R → part of job
- Constrained to demands of sponsors
- R → quick and dirty → may not meet hi standards.
- Apply to areas of interest to sponsors.
- Practical payoffs.
- Success → results are used by sponsors.



Types of applied research

- Action research: Those who are being studied participate in research process; research incorporates popular knowledge; focus on power with goal of empowerment increase awareness; tied to political action
- Impact Assessment: Estimate the likely consequences of planned change.
- Evaluation Research: Did the program work? Measures the effectiveness of program.



3. Time Dimension of Research

- ***Cross-Sectional Research:*** Observe at one point in time. Snapshot study.
- ***Longitudinal Research:*** Examine at more than one time. Can be →
 - Time series study.
 - Panel study.
 - Cohort study – Category of people who share the same experience.



4. Research Techniques Used

- **Experimental technique.** Quantitative
- **Surveys.**
- **Content analysis.**
- **Use of existing statistics.**
- **Field research.**
- **Case study.** Qualitative
- **Focus group discussions**

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Mixed methods/techniques



Theory and Research



The purpose of science concerns:

- **The expansion of knowledge;**
- **The discovery of truth; and**
- **To make prediction.**
- **→ Theory building is the means by which basic researchers hope to achieve this purpose.**



A scientist poses questions like:

- **What produces inflation?**
- **Does student teacher interaction influence students' performance?**

Looking for:

- **Explanation**
- **Prediction**
- **Understanding the process to reach prediction**
- **These are the purposes of theory.**



A systematic and general attempt to explain something...

A suggested explanation for something...

“Theory”

“Why do people commit crimes?”

“Why do people get married?”

“How does the media affect us?”

“Why do kids play truant from school?”

“Why do some people believe in God?”

“How is our identity shaped by culture?”



Theory

- **A coherent set of general propositions used as principles of explanation of the apparent relationships of certain observed phenomena.**
- **Key element in this definition is *proposition*.**

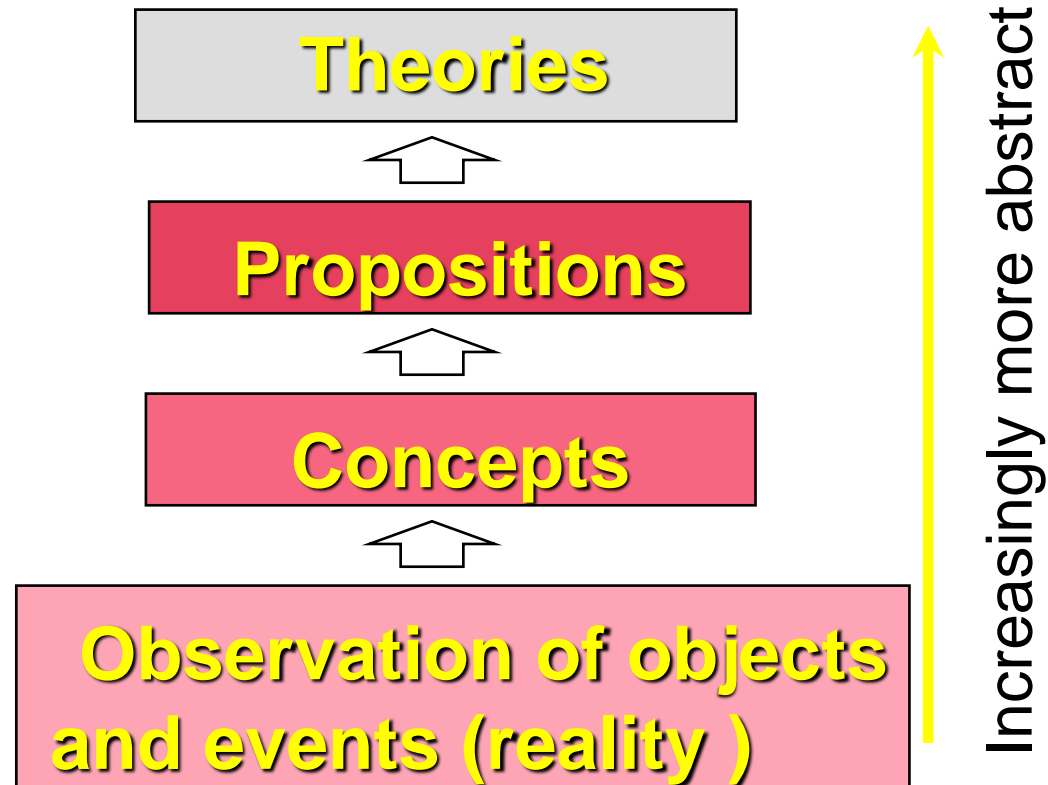


Proposition

- **A statement concerned with the logical relationships among concepts.**
- **Logic (argument) abstracted from observed reality.**
- **Theory is the highest level of abstraction.**
- **Theory is a network of propositions.**



Theory Building Is A Process Of Increasing Abstraction



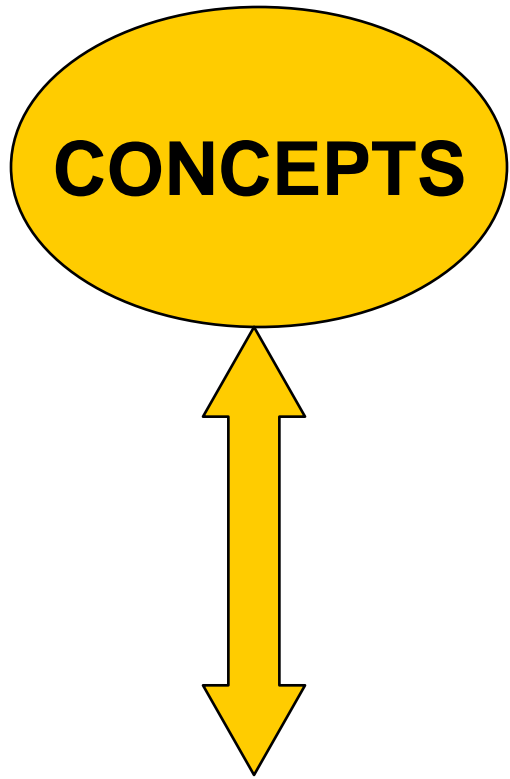
Concept

- **A generalized idea about a class of objects, attributes, occurrences, or processes that has been given a name**
- **Building blocks of theory that abstract reality. Examples →**
- **“leadership,” “productivity,” “morale,” “motivation,” “inflation,” “happiness,” “banana”**



Concepts are Abstractions of Reality

**Abstract
Level**

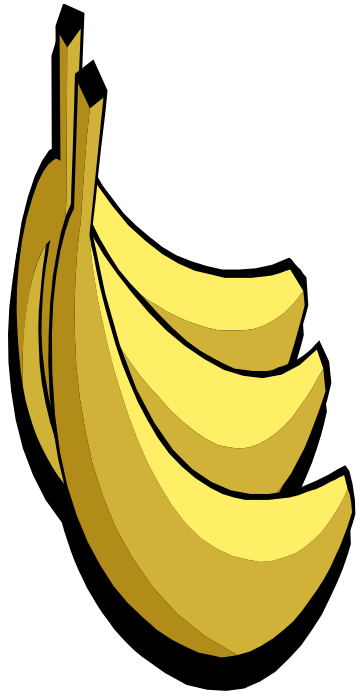


**Empirical
Level**

**OBSERVATION OF OBJECTS
AND EVENTS (REALITY)**



A Ladder Of Abstraction For Concepts



Vegetation



Fruit



Banana



Reality



Increasingly more abstract



Theory and Research

- **Research produces facts.**
- **Are facts and theories different?**
- **Soft mental images vs. empirical world of hard, settled, and observable things.**
- **Theory and fact (research) contribute to each other.**



Role of Theory

- ***Theory as orientation.*** Framework. Phenomenon may be studied in different ways. Narrows the range of facts to be studied. Study of football.
- ***Theory as conceptualization and classification.*** Provides concepts.
- ***Theory in summarizing role.*** Empirical generalizations.
- ***Theory predicts facts.*** Extrapolation.
- ***Theory points gaps in knowledge.***



Role of Facts

- *Facts initiate theory.*
- *Facts lead to the rejection and reformulation of theory. Alteration and expansion.*
- *Facts clarify theory.* New facts redefine theory. Provide further clarification.



Theory and Research: The Dynamic Duo

- Theory and research are interrelated. The dichotomy is artificial.**
- Researchers weave together knowledge from different studies into more abstract theory.**

