Research Methods 1:

Book: Research Methods in Applied Linguistics

Author: Dr. H. Farhady

Chapters 1 to 9 - 259 slides

Slide production: Dr. H. Iravani

Shahriar Center

Research Method I: Chapter 1

Chapter one: background

Research Methods 1

Sources of information:

1. **Sensory experience**
2. **Expert opinion**
3. **Logic**

Research Methods 1

Sensory information:

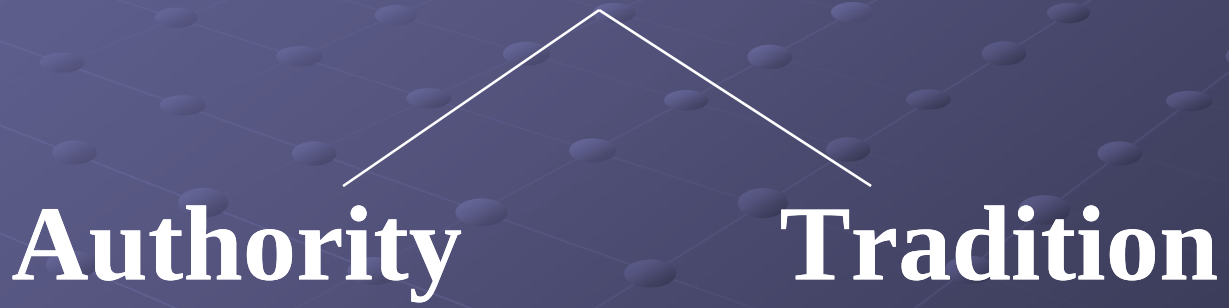
- **It is relative (not reliable)**
- **It can be increased by multiple sensation made by multiple people**
- **It is verifiable**

Research Methods 1

Expert opinion is

1. the easiest and most available source
2. subjective: it should be investigated empirically

Research Methods 1



Research Methods 1

Logic (the first scientific approach)

Aristotle founded deductive reasoning =

natural axiomatic facts → conclusion

Research Methods 1

An example:

1. **All men are mortal**
   (major premise)
2. **Aristotle is a man (minor premise)**
3. **Aristotle is mortal (conclusion)**

Logic

Deduction:

General

↓

Specific

Induction:

Specific

↓

General

Research Methods 1

Deductive reasoning was founded by Frances Bacon: moving from data and observable facts to conclusions

Research Methods 1

Enumeration: all instances are observed and counted, then conclusion is drawn

Research Methods 1

Scientific approach seeks for a compromise between

Deduction and Induction

Research Methods 1

Scientific Method:

- **It was derived from POSITIVISM.**
- **Natural positivism only relies on observable natural phenomena.**

Research Methods 1

The first principle is verifiability: Something can be meaningful if it is observable. Therefore, feelings, values and attitudes were non-observable and *not researchable*.

Research Methods 1

- Positivism was questioned in human sciences since human behavior is so complex.
- This led to Post Positivism.

Research Methods 1

Research **is a systematic approach to**

1

answering questions.

2 **3**

Research Methods 1

Chapter 2

Principles of Research

Characteristics of Research

Research is:

1) Systematic
2) Logical
3) Reductive
4) Replicable
5) Generative

Research Methods 1

Research is systematic:

It is a structured process

Researchers believe in *constancy* (regulation) and *uniformity* in natural events.

Research Methods 1

In physical sciences:

We have maximum constancy and uniformity because elements are (1) concrete, (2) observable and (3) controllable.

Research Methods 1

In human sciences:

We have abstract phenomena mixed with subjective, personal and relative features.

Research Methods 1

Research is logical:

a researcher should think, speak, act, and conclude *logically*.

Research Methods 1

Research is Reductive

Research Methods 1

Conceptual implication:

From many instances to generalization (similar to what a child does)

Research Methods 1

Practical implication:

A researcher's findings forms the basis of other researches (additivity / transmission of human knowledge).

Research Methods 1

Replicability: conducting a similar research (1) in a new environment, (2) with a new group of subjects, (3) at a different time

Research Methods 1

Three possible outcomes of replication: previous research is

(1) confirmed,

(2) partially confirmed,

(3) contradicted

Research Methods 1

- Replication acts as a validation technique. Therefore, reporting can be reliable and complete

Research Methods 1

Generativity: it is the key to scientific development. Research opens up new horizons and new borders of science. One question leads to many.

Research Methods 1

Goals of research:

(1) description

(2) prescription

(3) improvement

(4) explanation

Research Methods 1

Description:

Describing natural or man made phenomena (describing the relationship between IQ and language proficiency)

Research Methods 1

(1) how language is originated (2)what the structure is (3) how language works (4) how language has changed (5) how language is related to culture and society

Research Methods 1

Description is done through:

(1) Observation

(2) Tests

(3) Questionnaire

(4) Other instruments

Research Methods 1

Prediction (second goal of research): description should lead to prediction (predicting one's success according to his IQ)

Research Methods 1

Improvement (goal of research): the final end of research is to improve the quality of life (how to improve students' listening comprehension).

Research Methods 1

Explanation (goal of research):

Explanation goes beyond description. After you describe that girls are better L2 learners you explain the reasons.

Research Methods 1

By explanation, we try to find out why things happen the way they do. This leads to theorizing (from generalization to theory making).

Research Methods 1

Kinds and methods of research:

- **Kind refers to the nature of research**
- **Method refers to the procedures used in research**

Research Methods 1

Kinds of research:

(1) Exploratory (pure / applied)

(2) Confirmatory (pure / applied)

Research Methods 1

Methods of research:

(1) historical

(2) descriptive

(3) experimental

Research Methods 1

Exploratory research:

Exploring the mysteries of the universe

Research Methods 1

Confirmatory research:

Exact or partial replication of previous research for confirming previous researches (more common in research in language learning).

Research Methods 1

- Pure research: research for the sake of research. Research is the goal. Applicability is not important. Pure research adds to human knowledge.

Research Methods 1

- Applied research concerns the utilization of the findings. It is responsible for the good or evil of the findings (atomic energy)

Research Methods 1

Examples:

Exploratory pure: finding out the number of vowels in a new language in Amazon.

Research Methods 1

- Exploratory applied: the effect of chemicals on fluency (useful for lecturing and interviews)

Research Methods 1

- Confirmatory pure: to see if Broca and Wernicke (two brain areas) also work in very young children.

Research Methods 1

- Confirmatory applied: to find out if the correlation between IQ and success in L2 learning is positive. If yes, we can use this in our placement procedure.

Research Methods 1

- Research in natural sciences is more concrete (on sodium).
- Research in human sciences is more abstract and multi-aspected (on motivation)

Research Methods 1

Changing factors in human sciences:

age, gender, family, economy, natural / social environments, learning strategies, emotional / physical / mental conditions

Research Methods 1

Steps in conducting research:

1. **forming the questions**
2. **selecting the method**
3. **testing the hypothesis**
4. **writing the report**

Research Methods 1

Forming a research question:

Research comes from searching and we always search for an answer.

Questions should be converted into a hypothesis

Research Methods 1

- A hypothesis is a tentative (uncertain) statement about the outcome and results of the research.

Research Methods 1

A hypothesis comes from the researcher's expectations generating from:

(1) his knowledge

(2) the review of the literature

Research Methods 1

- A hypothesis expresses a relationship between two or more factors or variables.

Research Methods 1

- Question: what is the relationship between knowledge of grammar and fluency?
- Hypothesis: better knowledge of grammar leads to more fluency.

Research Methods 1

Question: what is the relationship between IQ and ability to learn L2?

Hypothesis: more intelligent students are better language learners.

Research Methods 1

Selecting a good method:

A method is selected based on a design (will be discussed later)

Research Methods 1

Testing the hypothesis:

First data should be collected, then analyzed through statistical techniques, and the results should be interpreted.

Research Methods 1

- Preparing the report (last step in conducting research): to inform the others about the results we write a well organized report.

Research Methods 1

Section two

Formulating Research Questions

Research Methods 1

In formulating questions ----------
must be determined:

1. area of research (chapter 3)

2. a question within that area (ch. 4)

3. features of the question (ch. 5)

Research Methods 1

Chapter 3

Areas of Research in Language Education

Research Methods 1

Areas of research in TEFL:

1. **teaching (education)**
2. **language (linguistics)**
3. **learner (social environment)**
4. **learning (psychology)**

Research Methods 1

- The scope of applied linguistics?
- It includes all branches of linguistics. Branches of linguistics intersect with other discilines.

Research Methods 1

Questions in linguistics:

1. **phonology**
2. **morphology**
3. **syntax**
4. **semantics**

Questions in Methodology

1. Curriculum development
2. Syllabus design
3. Teacher training
4. Material preparation
5. Methodology
6. Testing

Research Methods 1

Questions on factors influencing TEFL:

1. **Cognitive factors**
2. **Personality factors**
3. **Social factors**

Research Methods 1

Cognitive factors:

A. process (general mental activity)

B. style (individual mental activity)

C. strategy (idiosyncratic mental activity)

Research Methods 1

Different types of learning:

A. signal learning

B. stimulus response learning

C. verbal association

D. multiple discrimnation

Research Methods 1

E. concept learning

F. problem solving

G. discovery learning

H. rote leaning

i. inductive learning

Research Methods 1

J. deductive learning

K. meaningful learning

……. The list is open

Research Methods 1

When two or more languages are learned, the cognitive processes:

A. transfer (L1 to L2 or vice versa)

B. interference

C. overgeneralization

Research Methods 1

- Transfer, interference, overgeneralization and similar cognitive processes are discussed in contrastive analysis and error analysis.

Research Methods 1

Style (another cognitive factor):

Persistent differences in cognitive functioning such as:

A.field dependent (totality)

B.field independent(individual parts)

Research Methods 1

Brain (a cognitive factor):

A. left hemisphere dominance

B. right hemisphere dominance

Research Methods 1

Affective factors (emotions and feelings):

A. interpersonal interactions

B. intrapersonal interactions

Levels of Affectivity (Brown 1987)

A. receiving

B. responding

C. valuing

D. organizing the values

F. identifying oneself with value system

Research Methods 1

Self esteem (affective factor):

The way a person evaluates himself. Positive attitude is helpful (self confidence)

Research Methods 1

Inhibition (affective factor):

The defense system one builds around himself.

Research Methods 1

Alienation (affective factor):

Critical learner vs. performing learner; first language vs. second language; learner vs. teacher; learner vs. learner; L1 culture vs. L2 culture

Research Methods 1

Anxiety (affective factor):

A. debilitative anxiety

B. facilitative anxiety

Research Methods 1

Motivation (affective factor): an inner force, emotion or desire to achieve a goal

A. integrative

B. instrumental

Research Methods 1

Integrative motivation: learner wants to associate himself with L2 culture (≠ alienation)

Research Methods 1

Instrumental motivation:

Learner wants to learn L2 for further education, finding a job, reading manuals, watching films, …

Research Methods 1

Social factors (questions in TEFL)

Widdowson (1979) makes a distinction:

A. Usage: linguistic forms

B. use: communicative functions of language

Research Methods 1

Attitude (social factor):

A. positive attitude to L2 (integration)

B. negative attitude to L2 (alienation)

Research Methods 1

Acculturation (social factor)

Adding a culture, or at least becoming identified with a new social group [culture shock vs. anomie] (Hudson 2000).

Research Methods 1

Questions in language and literature

(language is a medium to understaning literature):

A. relationship between the two

B. readability formulas

Research Methods 1

C. linguistic aspect of literary text (lexical difficulty and syntactic complexity)

Lexicon → Syntax → Culture → Literature

Research Methods 1

Language and technology:

A.Impact of technology on education

B. utilization of mechanical and electronic devices

C. programmed instruction

Research Methods 1

D. content analysis through technological software

Research Methods 1

- Questions in language and politics (policy making):
- A. national language vs. local languages
- B. selecting a second language
- C. formal vs. informal languages

Research Methods 1

D. coining new words

E. finding equivalent words

F. deciding when to start teaching L2

Research Methods 1

G. deciding how to deal with L2 culture

H. deciding on an L2 entrance level for university students

Research Methods 1

Chapter 4

The Research Question

Research Methods 1

All research projects start with a question

Students fail to make good questions because:

A. they do not observe well.

Research Methods 1

B. they take written and spoken materials as truth.

C. they can not find a topic

Research Methods 1

Characteristics of a good research question:

1. **interest**
2. **relevance**
3. **manageability**

Research Methods 1

Interest:

If the researcher is interested in the topic he conducts it with great eagerness and care.

Research Methods 1

Relevance:

Research should have short term or long term relevance to the needs of the society (research on African or Iranian subjects?).

Research Methods 1

Manageability:one should manage to conduct the research (parameters: man power; expertise; financial support; time; equipment; social and educational limitations)

Research Methods 1

Narrowing down the topic:

How is L2 learned?

In what order does an Iranian female young adult learn English vowels?

Research Methods 1

- Why do we prefer “in what order” to “how”?
- Quantity (how many, how often, how fast, …) words are easily measured.

Research Methods 1

What is the best method? (broad)

Would Audiolingual method lead to a better test score than Grammar Translation method for Iranian female students in Rahnamai?

Research Methods 1

A question involves two variables.

What is the relationship between

IQ and achievement in vocabulary learning for Iranian English learners?

Research Methods 1

Types of research question:

1. Descriptive

2. Correlational

3. Cause-Effect

Research Methods 1

Descriptive Qs are in search for

A. Frequency, B. Duration,

C. Intensity, D. Range, and

E. Sequence of an event or behavior.

Research Methods 1

Correlational questions:

- **The degree of relationship between two or more variables.**
- **What is the relationship between X and Y?**

Research Methods 1

- Cause-Effect questions require experimentation.
- Causal relationship between two or more factors as in:
- "What is the effect of X on Y?"

Research Methods 1

Formulating a hypothesis:

A hypothesis is an uncertain or tentative answer to the question

Research Methods 1

Question: what is the relationship between X and Y?

Hypothesis: there is a relationship between X and Y.

X=IQ Y = Accuracy in Grammar

Research Methods 1

- After collecting data and testing the hypothesis, the hypothesis is supported, rejected, or partially supported.

Research Methods 1

Hypothesis

Directional — **Alternative**

Nondirectional — **Null**

Research Methods 1

- **Directional Hypothesis: the researcher predicts a positive or negative relationship between two variables.**

Research Methods 1

Example:

H_1: There is a positive relationship between IQ and Second language acquisition.

Research Methods 1

Example:

H_1: There is a negative relationship between age and Second language acquisition.

Research Methods 1

Nondirectional or null hypothesis (the researcher tries to reject it): No particular relation is predicted or suggested.

Research Methods 1

Example:

H_0: There is no relationship between the age of learner and the speed of learning L2 vowels.

Research Methods 1

Chapter 5

Review of Literature

Research Methods 1

- Review of literature: searching for documents and reports related to the topic (additivity).

Research Methods 1

A. How comprehensive should it be?

B. How many sources?

C. What kind of sources?

D. Where to find sources?

E. How to read?

Research Methods 1

Goals of Literature Review?

1.a. To put the topic within a scientific perspective.

1.b. To help formulate a better question (deleting or adding a factor).

Research Methods 1

2.a. To avoid mere duplication

2.b. To find new unexplained items.

3. To avoid inadequacies of previous research (e.g., the proficiency test was not standard).

Research Methods 1

The focus of literature review should be on theory, method and data analysis of the previous research. Theory is the foundation of all research.

Research Methods 1

Method includes (1) subjects, (2) the instruments to collect data, (3) the procedures, (4) kind, method and design of research and (5) statistical analysis.

Research Methods 1

- Statistical analysis includes the presentation and interpretation of results 9section four).

Research Methods 1

Finding the source of information:

A. Encyclopedia

B. Abstracts

C. Books and articles

D. Dictionaries,yearbooks,journals

Research Methods 1

Periodicals in TEFL:

(1) Language Learning (2) TESOL Quarterly (3) Modern Language Journal (4)Language Teaching Journal (5) Linguistics

Research Methods 1

(6) Applied Linguistics (7) International Review of Applied Linguistics (8) Language (9) Language Testing (10) Language Acquisition

Research Methods 1

When recording bibliographical information, try to include:

1. **Full name of the author**
2. **Full title of the document**
3. **Place, publisher, date 4. Pages**

Research Methods 1

When taking notes, take care:

1. Do not copy

2. Do not ignore unimportant notes

3. Keep them in an organized way

4. Collect comprehensive notes

Research Methods 1

The process of Note Taking:

1. **Write legibly in ink**
2. **Write on one side of the card**
3. **Use abbreviations**
4. **Label the cards for later use**

Research Methods 1

American Psychological Association (APA) Format:

Tuckman, B. (1972). Conducting educational research. New York: Harcourt Brace.

Research Methods 1

Modern Language Association (MLA) Format:

Tuckman, B. Conducting Educational Research. New York: Harcourt Brace, 1972.

Research Methods 1

Chapter six

Characteristics of a variable

Research Methods 1

A hypothesis (Null/Alternative) involves the relationship between two or more variables:

"What is the effect of IQ on language learning?"

Research Methods 1

Variable: an attribute changing from person to person, object to object, or time to time

(e.g., size, height, temperature, IQ, knowledge of grammar,…)

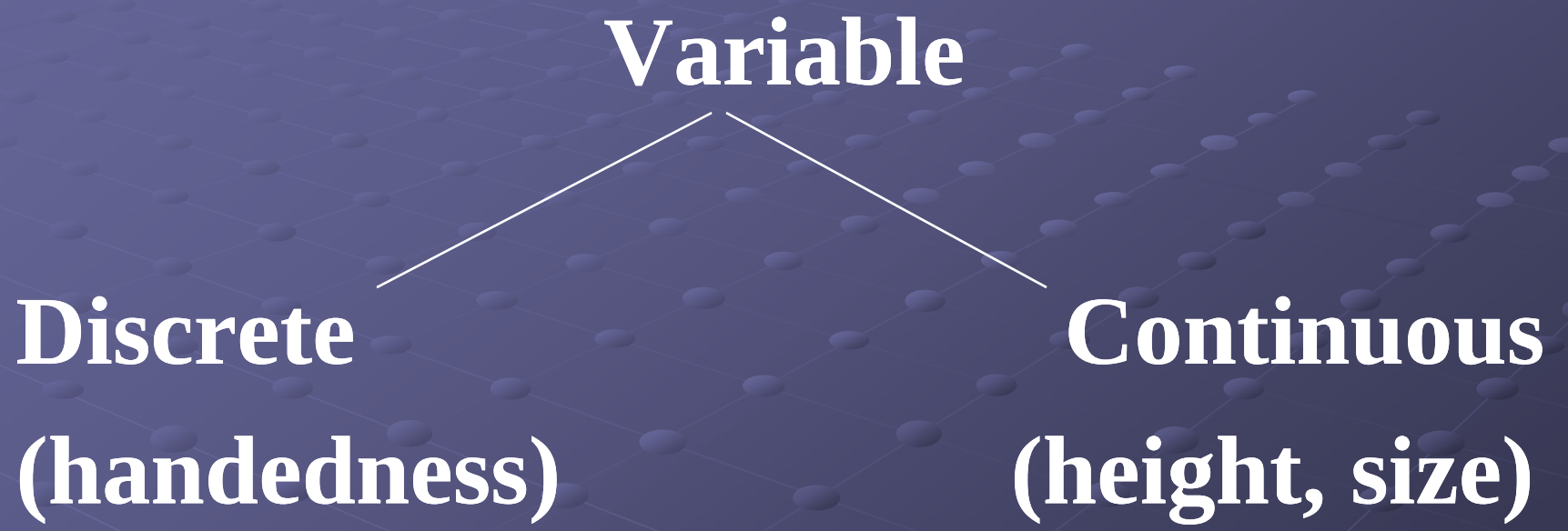
Research Methods 1

Variable

Concrete (size)

Abstract (motivation)

Research Methods 1



Research Methods 1

Examples:

***Handedness*: discrete and concrete**

***Cognitive style:*discrete and abstract**

***Intelligence*: continuous and abstract**

***Height*: continuous and concrete**

Research Methods 1

We *narrow down* the topic by *reducing* the number of variables.

A topic becomes *manageable* by *specifying the features* of the variables.

Research Methods 1

Variables should be defined from:

(1) A theoretical perspective.

a variable has a theory behind it

(2) An operational perspective. It has some measurable features.

Research Methods 1

Measurement scales of variables:

1. Nominal scale

2. Ordinal scale

3. Interval scale

4. Ratio scale (NOIR)

Research Methods 1

Nominal scale (for concrete variables, all or nothing nature):

Numbers (without mathematical values) are used to label variables.

Research Methods 1

Ordinal scale (not easily measured, abstract as for happiness, interest):

people or objects are ranked from high to low (very happy, happy, unhappy, very unhappy).

Research Methods 1

- Different cut off points are labeled by numbers. Numbers are meaningful but they do not specify the differences accurately. Distances are not equal.

Research Methods 1

- Interval scale (similar to ordinal scale): It determines how much of an attribute exists. The distances are equal and have mathematical values (as in test scores)

Research Methods 1

The distances are theoretically equal but not in practice (interval scale is the most objective scale in human sciences).

Research Methods 1

- Ratio scale (exclusive in natural sciences):
- It has true zero (and minus points) and equal distances as for temperature. It is not used ion social sciences.

Research Methods 1

- Convertibility of measurement scales:
- A variable may be measured on different scales depending on the nature of research.

Research Methods 1

Convertibility **works from interval to ordinal or nominal scales as in language proficiency: interval scale (scores of 1 to 20) can be converted to ordinal and nominal scales.**

Research Methods 1

Functions of variables

Variables are attributes of people or things (e. g., eye color, language ability, fluency, knowledge of grammar, pronunciation).

Research Methods 1

There is no relationship between (variable 1)teaching listening comprehension and students' (variable 2)achievement in language proficiency.

Research Methods 1

After selecting the variables, they should be operationally defined.

variables

Independent **Dependent**

Research Methods 1

- Achievement on language proficiency is a dependent variable (it is observed and measured but not manipulated).

Research Methods 1

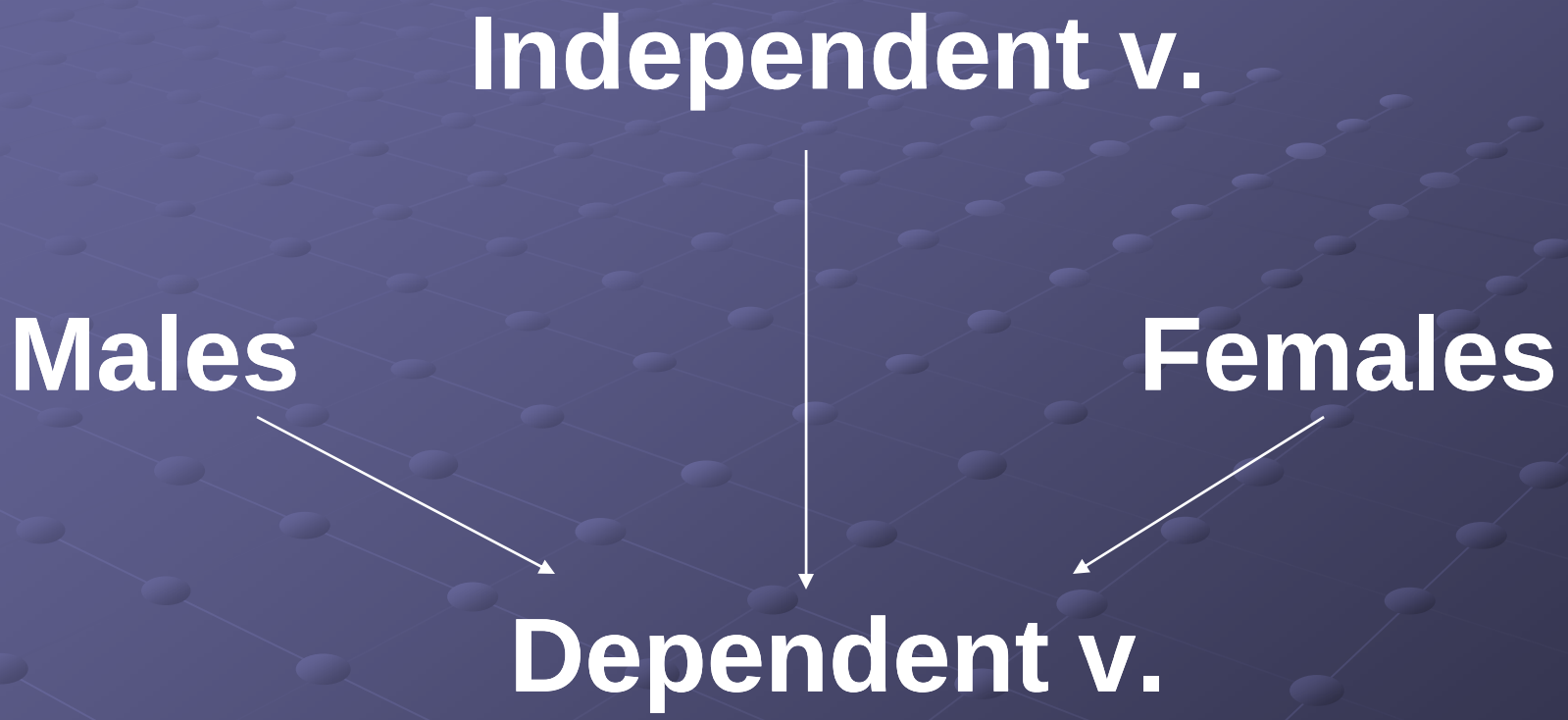
The instruction on listening comprehension is an independent variable (it is manipulated through time, method, subjects, period, materials, teachers, …).

Research Methods 1

Independent variable (cause)

Dependent variable (effect)

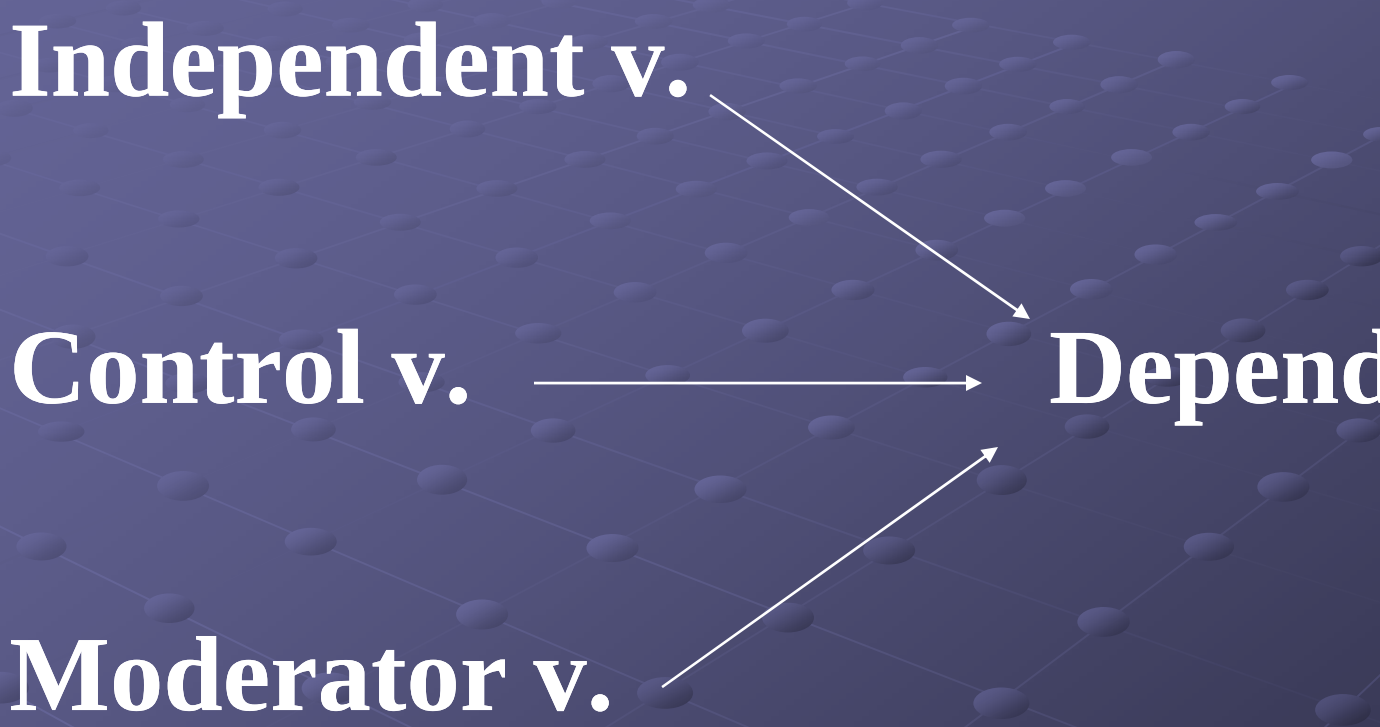
Research Methods 1



Research Methods 1

- Gender is a *moderator variable*
- A moderator variable modifies the relationship between the independent and dependent variables (but it can not be manipulated).

Research Methods 1

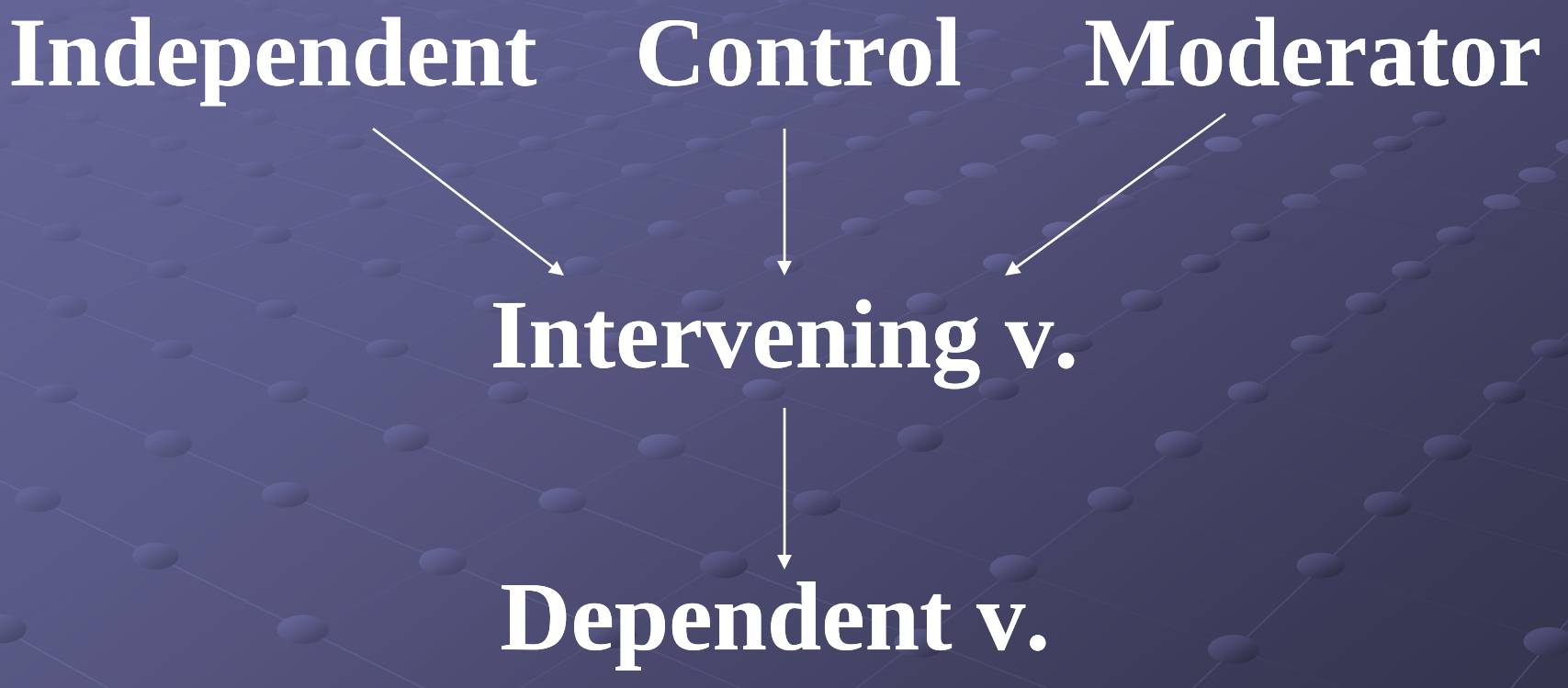


Research Methods 1

A variable which is controlled and kept constant to neutralize its effect on the outcome is called the *control variable* .

(e. g., language background).

Research Methods 1



Research Methods 1

Intervening variable

(not measurable or observable) stands between the independent and dependent variables (e.g., learning an underlying factor).

Research Methods 1

SECTION TRHREE

SELECTING AN APPROPRIATE RESEARCH METHOD

Research Methods 1

After the selection and operational definition of variables, the method should be determined. A method is the procedure used to answer the question and test the hypothesis.

Research Methods 1

A method should be (1) time, (2) energy and (3) cost effective.

- Historical method
- Descriptive method
- Experimental method

Research Methods 1

CHAPTER 7

HISTORICAL METHOD OF RESEARCH

Research Methods 1

TO STUDY THE PAST IS THE BEST WAY TO UNDERSTAND THE PRESENT

Research Methods 1

- Literature review is different from historical method. The former is to collect what others have done about a topic.

Research Methods 1

- Historical research is a systematic collection and an objective evaluation of the past events to test the hypotheses about causes, effects or trends in the past.

Research Methods 1

Historical research:

- **deals with nonliving subjects**
- **has a different procedure**
- **gives insight**
- **finds solutions for future problems**

Research Methods 1

- has a question and hypothesis
- is very common in human sciences
- may not produce generalizations
- doesn't operate in a closed system

Research Methods 1

Historical m. involves these steps:

1. Formulating the problem, 2. formulating hypotheses, 3. collecting data. 4. criticizing the data, 5. interpreting the findings.

Research Methods 1

Formulating a problem:

Explaining the past and predicting the future are the basic goals.

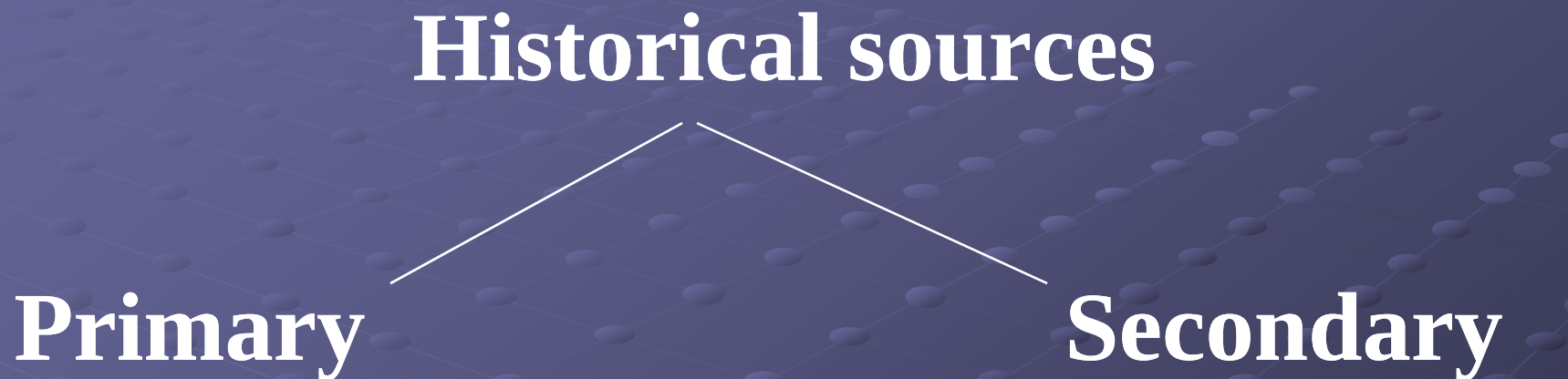
Research Methods 1

Different sources are researched in historical method (no scientific measurement may be involved): 1. official records, 2. nonofficial records, 3. physical remains

Research Methods 1

Nonofficial records may include: 1. personal records, 2. tales, letters, contracts, 3. drawings, paintings, 4. book, articles, and 5. mechanical records such as tapes.

Research Methods 1



Research Methods 1

- Primary sources of information are produced by actual participants or witnesses, dead or alive (e.g., laws and news papers).

Research Methods 1

Secondary sources on information are obtained indirectly (less reliable). Historical sources should be examined for authenticity and truthfulness (CRITICISM).

Research Methods 1

Research Methods 1

- External criticism deals wit the authenticity (genuineness) of the materials. Is the document real? Is it really written by the claimer?

Research Methods 1

- Internal criticism deals with the accuracy of the content. Isn’t it biased?
- Historical sources should be reconfirmed.

Research Methods 1

Accuracy can be checked by :

- considering the knowledge of the writer
- examining the time elapse between the event and its creation.

Research Methods 1

- checking the bias and motives of the writer
- cross validating the data

Research Methods 1

CHAPTER 8

DESCRIPTIVE METHOD OF RESEARCH

Research Methods 1

- Descriptive method involves the description and interpretation of the phenomena.

Research Methods 1

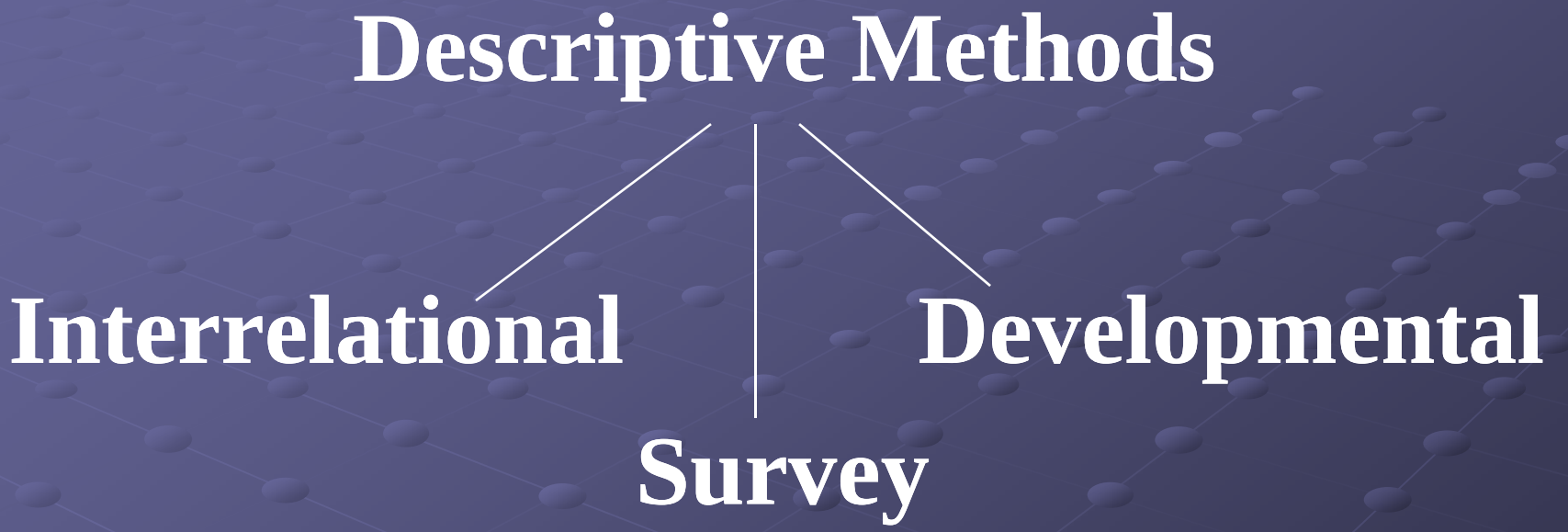
Descriptive method is important because:

1. A great number of research in education is descriptive (since experimentaion is difficult).

Research Methods 1

2. descriptive method has different techniques suitable for different questions.

Research Methods 1



Research Methods 1

Survey methods involves asking direct questions to 1. describe the nature of conditions (describing the composition of students),

Research Methods 1

2. Identifying standards (describing the ideas of students and their progress in a quality university), and

Research Methods 1

3. Determining the relationship between conditions (describing the family pressure on students and their choice of majors).

Research Methods 1

Surveys may vary in (1) complexity (frequency counts vs. describing the nature of L1 acquisition), and (2)scope (a school vs. the whole country).

Research Methods 1

Different factors to consider:

1. **Specifying the purpose (narrowed down)**
2. **Selecting the type of information (facts, opinions, behaviors).**

Research Methods 1

- Facts: age, race, gender, income, period of education (verifiable)
- Opinion: feelings, likes, dislikes (non-verifiable)
- Behavior: how frequent one does an action (verifiable)

Research Methods 1

The third factor is the instrument in data collection:

- **Questionnaire**
- **Interview**
- **Observation**

Research Methods 1

Survey Methods:

1. School Survey

2. Community Survey

3. Public Opinion Survey

Research Methods 1

School Survey

Related issues: learners/teachers characteristics; learning process; legal and managerial matters,; physical settings.

Research Methods 1

- In School Survey affective factors can be surveyed (motivation, attitude, self esteem, socioeconomic background, …)

Research Methods 1

Community Surveys

Similar to school survey (health service, employment, situation of minority groups, …)

Research Methods 1

Public Opinion Surveys

Surveys on educational, political and industrial matters for decision making

Research Methods 1

Interrelational Methods:

involve the discovery of the relationship among factors or variables.

Research Methods 1

Four methods of interelations:

1. **Case studies**
2. **Field studies**
3. **Correlational studies**
4. **Causal-comparative studies**

Research Methods 1

Case Studies:

deal with the investigation of a social unit. Observing the way a child acquires his L1 is an example.

Research Methods 1

A Survey involves collecting data on a few factors from many people but a Case Study is narrow in scope but more exhaustive and qualitative.

Research Methods 1

Field Studies:

deals with the investigation of the features of a phenomenon.

Research Methods 1

Key terms in Field Studies:

- **Direct Observation**
- **Naturally Occurring Event (naturalistic method)**

Research Methods 1

Field linguistics:

Collecting data on nonverbal behavior, body movement, facial expression, eye contact, posture and gesture

Research Methods 1

Two kinds of sampling in field research:

1. Continuous time sampling (observing the library behavior of students over the term)

Research Methods 1

2. Time point sampling (observing the students' behavior around midterm or final exam)

Research Methods 1

Correlational Studies

Deal with the discovery, measurement, or determination of the degree of relationship between two variables.

Research Methods 1

Negative Correlation:

The magnitude of variable1 increases while that of variable 2 decreases (accuracy in speaking and grammar errors)

Research Methods 1

Positive Correlation:

The magnitude of variable1 increases while that of variable 2 also increases (height and weight)

Research Methods 1

Factors to consider:

1. Data should collected on every single subject to determine the degree of relationship.

Research Methods 1

2. the interpretation of a given relationship should be done cautiously. How do you interpret a high relationship between intelligence and achievement?

Research Methods 1

Three possibilities:

1. **Intelligence affects achievement**
2. **Achievement affects intelligence**
3. **A third factor affects both**

Research Methods 1

Correlation does not necessarily mean causation (a cause-effect relationship). Both height and weight are under the effect of nutrition (the third factor).

Research Methods 1

- The third factor: Gotogetherness (correlation) may be without special reasons. The correlation should be interpreted based on the theory (height and fluency).

Research Methods 1

To find the causal relationship we conduct causal-comparative research (also done through experimental methods).

Research Methods 1

- Causal comparative and correlational research are both descriptive but the former involve two or more groups and one independent variable and comparison.

Research Methods 1

- Correlational studies involve two or more variables and one group and looks for gotogetherness.

Research Methods 1

Both causal comparative and experimental methods involve cause-effect relationship and group comparison. In the former we do’t manipulate the variables.

Research Methods 1

- In an experimental research we create the cause by offering different treatments-independent variable (to see the effect of vitamins on intelligence).

Research Methods 1

In an causal-comparative study (ex-post-facto), we observe the effect and find out the cause. To find that preschool language learning affects the students' achievement.

Research Methods 1

Problems of causal-comparative studies:

No control over variables

No single factor may be the cause

Contradictory findings may happen

Research Methods 1

Developmental Methods

Deals with the changes that take place over time.

1. longitudinal method

2. cross-sectional method

Research Methods 1

In Longitudinal studies, the development is investigated over a long period of time at special intervals (language acquisition,cognitive development).

Research Methods 1

In cross-sectional method, we obtain data in a short period of time or even in one session (selecting many children at different ages and collecting data).

Research Methods 1

Cross-sectional studies involve many subjects in little time while longitudinal studies involve few subjects over a long time.

Research Methods 1

CHAPTER 9

EXPERIMENTAL METHOD OF RESEARCH

Research Methods 1

- The experimental research does not have the shortcomings of the Historical and descriptive methods.

Historical and Descriptive methods do not lead to strong conclusions about the variables. They look at what happened in the past or what is happening at present.

Through Historical and Descriptive Methods, we can not make cause and effect relationships among variables. Experimental method is the peak of scientific research

- **Principles of the Experimental Method**
- **Certain features should exist: randomization, pretesting, having experimental and control group, ..**

… offering a treatment to the experimental group and a placebo to the control group, and post testing.

- Depending on the extent of using these requirement, three types of experimental methods have emerged:

1. True Experimental (if all requirements are met)
2. Pre-experimental (if one or two requirements are not met)

3. Quasi-experimental (we try to compensate for the violation of certain principles)

Each will be discussed separately.

- True Experimental Method
- The strongest method in education. Here all requirements should be met.

- If we want to see the effect of a new method of teaching dialogues on speaking ability.
- 1. A random group of students should be selected. Why?

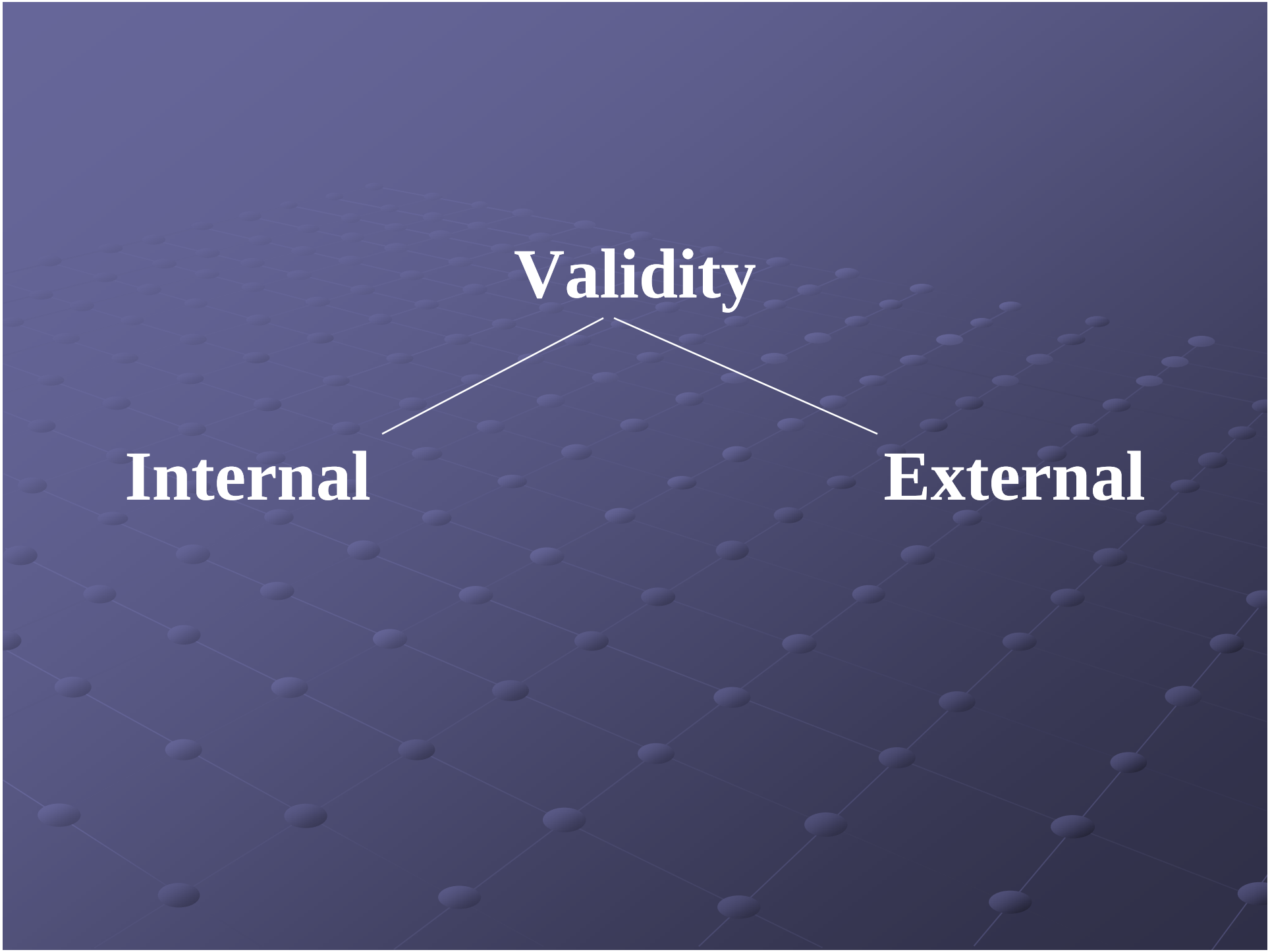
2. The researcher should find a control group (taught by a traditional method).

3. We need to give a pre-test to prove that all students had almost equal abilities at the beginning.

4. the researcher needs a post test to prove the privileges of his innovative group. If the experimental group performed better, the claim is confirmed.

Validity: If an answer to a question is (1) verifiable and (2)applicable,it is valid.

- **Verifiablity: similar research leads to similar results.**
- **Applicability: the results of a research are applicable to similar situations outside the experiment (generalizablity).**



Internal validity:The extent to which the changes in the dependent variable are due to the manipulation of the independent variable (and not other factors).

- To ensure internal validity, the researcher should control as many variables as possible.

Threats to internal validity:

1. **History effect (attending extra classes).**
2. **Maturation**
3. **Testing effect (pre testing and post testing)**

4. Selection effect
5. Mortality effect (loss of subjects/attrition).

External validity:

The extent to which the outcomes would apply to other similar situations (generalizablity from sample to population).

- The more controlled the conditions are, the more internal validity can be obtained and the less the external validity results.

- If one of the requirements of True Experimental research is nor met, the method changes to Pre-Experimental method.

Pre-Experimental Methods:

1. One-shot case study (no control group)
2. One-group pretest post test study
3. Intact group study (without random selection)

- Quasi-Experimental methods are alternatives for True-Experimental methods.

Time-Series Study (the most common type of Quasi-Experimental method):

T1 T2 T3 X T4 T5 T6

Equivalent-Time Series Method:

T1 X T2/T3 O T4/T5 X T6/T7 O T8,.

The End
Research Methods I