The Research Hypotheses

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Hypothesis Defined

- A temporary or tentative explanation about the relationship between certain behaviors, phenomena or events which have occurred or will occur
- It is a testable statement of probable relationship between two or more variables
- Used for Level 2 or 3 type of inquiry

Classifications of Hypothesis

A. Research Hypothesis
B. Statistical Hypothesis

Research Hypothesis

- A temporary solution to a statement of the problem
- Example:
  - Statement of the Problem
    - To what extent is the relationship between age and hemorrhagic hypertension significant?
  - Hypothesis
    - There is no significant relationship between age and hemorrhagic hypertension.

Research Hypothesis

- Statement of the Problem:
  - To what extent is the relationship between the time of the year and room utilization in hospitals?
- Hypothesis:
  - There is no significant relationship between the time of the year and room utilization of hospitals
- Statement of the Problem:
  - To what extent is the relationship between the category of the clinical laboratory and the amount of waste it generates?
- Hypothesis:
  - There is a significant relationship between the category of the clinical laboratory and the amount of waste it generates.

Statistical Hypothesis

- A hypothesis which receives action of acceptance or rejection based on inferential statistics
- Two forms:
  - Null hypothesis
  - Alternative hypothesis

Null hypothesis

- Always the first temporary solution to a problem which receives the action of acceptance or rejection
- If the null hypothesis is rejected, then the alternative hypothesis is accepted
- If the null hypothesis is accepted, there is no need for the alternative hypothesis
- **Asserts that <u>there is NO significant difference</u> between two variables or relationship among variables** (*null* in mathematics means empty to zero)
- Recommended use because of less errors and bias

Null hypothesis

- There is no significant relationship between heredity (A) and mental ability (B)
  - Ho: A:B = 0
- There is no significant difference between the effects of Fish Oil (A) and Pharmatone (B) on the treatment of anemia
  - Ho: A = B
    or
  - Ho: A-B = O

Alternative Hypothesis

- The opposite (alternative form) of the null hypothesis
- Presented and accepted if the null form is rejected
- **Asserts that <u>THERE IS a significant relationship</u> between variables or relationship among variables**
- Three forms:
  - Nondirectional hypothesis
  - Positive directional hypothesis
  - Negative directional hypothesis

Nondirectional hypothesis

- States that there is a significant relationship between variables or relationship among variables but does not state the direction (greater or lesser)
- The interest lie only in the difference, not the direction
- Uses a two-tailed test that is rigid

Positive Directional Hypothesis

- Uses the positive tail or upper tail of the distribution curve
- It is therefore a one-tailed test and is less rigid

Negative Directional Hypothesis

- Uses the negative tail or lower tail of the distribution curve
- It is therefore also a one-tailed test and less rigid

Forms

- Is there a significant difference between the effects of Fish Oil (A) and Pharmatone (B) on the treatment of anemia?
  - Null hypothesis: Ho: A = B
  - Alternative Nondirectional Ha: A ≠ B
  - Positive directional Ha: A > B
  - Negative directional Ha: B < A

Forms

- There is no significant difference between the effects of Fish Oil (A) and Pharmatone (B) on the treatment of anemia
- There is a significant difference between the effects of Fish Oil (A) and Pharmatone (B) on the treatment of anemia
- Fish Oil (A) has significantly better effects than Pharmatone (B) on the treatment of anemia
- Pharmatone (B) has significantly lesser effects than Fish Oil (A) on the treatment of anemia

- Mangrove extract is better than lipitor in lowering the lipid profile of guinea pigs.
- Lipitor is not better than mangrove extract in lowering the lipid profile of guinea pigs.

Seatwork

- Is there a significant difference between the effects of insulin and *ampalaya* in lowering the blood glucose levels of Type I diabetic patients?
- Is academic performance a better indicator for passing the board examinations than skills in laboratory performance?

- There is no significant difference between the effects of insulin and *ampalaya* in lowering the blood glucose levels of Type I diabetic patients.
- There is a significant difference between the effects of insulin and *ampalaya* in lowering the blood glucose levels of Type I diabetic patients.
- Insulin is has significantly better effects than *ampalaya* in lowering the blood glucose levels of Type I diabetic patients.
- *Ampalaya* has significantly lesser effects than ampalaya in lowering the blood glucose levels of Type I diabetic patients.

- There is no significant difference between academic performance and skills in laboratory performance as predictor in passing the board examination.
- There is a significant difference between academic performance and skills in laboratory performance as predictor in passing the board examination.
- Academic performance is better than skills in laboratory performance as predictor in passing the board examination.
- Skills in laboratory performance is not better than academic performance as predictor in passing the board examination.

Characteristics of a Good Hypothesis

- It clearly states what variables are used
- It clearly states how the variables are used
- It determines the purpose of the study
- It is testable
- It clearly determines the significance of the relationship or difference of sets of variables
- It is comparative in analysis
- The independent and dependent variables are clear, specific and isolated

Variables

- Are characteristics possessed by an object, situation or people
- They are arbitrary hence the name variable
- They vary in different situations and not constant in all situations

Variables can be classified as:

- Quantitative
- Qualitative

Quantitative Variables

- Variables that can be measured quantitatively or numerically
- Examples:
  - Age, IQ, number of years in service, scores in examination, grade point average, number of hours slept, temperature in degrees, blood pressure, heartbeat, number of white blood cells

Qualitative Variables

- Those that cannot be measured quantitatively or cannot be expressed numerically
- Examples:
  - Gender, civil status, educational attainment, amount of grief, stress, amount of depression, types of blood extraction

Variables in correlational studies are classified as:

- Independent variable
- Dependent variable
- Other types of variables

Independent Variable

- The variable manipulated by the researcher
- It is the variable that predicts relationship, or an intervening variable in comparative analysis or the x-variable
- It is the presumed **CAUSE** of a relationship

Dependent Variable

- Sometimes referred to as the criterion measure (variable) or the y-variable
- Is the presumed **EFFECT** dependent on the x-variable (which is the cause)

Other types of variables

- Controlled variables
- Confounding variables
- Extraneous variables

Variables and Hypothesis Formulation

- Simple Hypothesis
- Complex Hypothesis
- Component Hypothesis

Simple Hypothesis

- Age is significantly related to hemorrhagic stroke
  - IV: age
  - DV: hemorrhagic stroke
- Socioeconomic status is significantly associated to severe diarrhea
  - IV: socioeconomic status
  - DV: severe diarrhea

Complex Hypothesis

- There is no significant relationship between hemorrhagic stroke with age and diabetes mellitus
  - IV: age
    diabetes mellitus
  - DV: hemorrhagic stroke

Complex Hypothesis

- There is no significant relationship between the IQ of a person and his EQ, TQ, health, habits and heredity
  - IV: IQ
  - DV: EQ
    TQ
    health
    habits
    heredity

Component Hypothesis

- Pregnant mothers who perform moderate exercises do not significantly suffer during labor than those who do not exercise.
- Experimental group: pregnant mothers who perform moderate exercise
- Expected results: less suffering during labor
- Comparison group: pregnant mothers who do not perform moderate exercise

Variables in Titles

- Effect of Group Counseling on the Academic Performance and Emotional Intelligence of Secondary High School Students
- Determinants of Teaching Performance of Allied Medical Professions Faculty of Lyceum of the Philippines University
- Effect on the Gram-positive Bacterial Cell Wall of Monolourin as Assessed by Cell Lysis and Electron Microscopy
- Political Maturity and the Exercise of the Suffrage in the Philippines

The End (wish ko lang!)

Class Exercise

- Work performance ratings of RMT's are significantly related to level of job satisfaction
- Admission of patients depends upon the season of the year and age of patients
- A person's eyesight is affected by age and state of health
- There is no significant relationship between internship grades and board examination scores
- There is no significant relationship between the risk factors for hemorrhagic and nonhemorrhagic stroke
- Donors who received pre-donation counseling will experience less pain during phlebotomy than those who do were not counseled.

Class Exercise

- Board examination scores and laboratory proficiency of medical technologists in the Province of Batangas
- Effects of Nutritional Feeding and Deworming on the Academic Performance of Elementary Students in Barangay Marikaban, Tingloy, Batangas
- Zero-based Grading System: Its Implications to the Retention of the Medical Laboratory Science Students of Lyceum of the Philippines University
- Career expectations and retention of Medical Technologists in the Philippines

Class Exercise

- Lulu wants to determine if the household income of a family affects the incidence of lifestyle diseases in the family. Formulate the following based on the said situation:
  - Hypothesis as to the following types:
    - » Null hypothesis
    - » Alternative hypothesis
  - Research questions as to the following types:
    - » Factor-isolating questions
    - » Factor-relating questions
    - » Situation-relating questions
    - » Situation-producing questions
  - Research questions as to the following levels of inquiry:
    - » Level 1
    - » Level 2
    - » Level 3
  - Formulate a title for the problem mentioned above.
  - Identify the independent and dependent variables in the title you have formulated.

Null Hypothesis

- There is no significant relationship between the household income of the family and the incidence of lifestyle diseases

Alternative Hypothesis

- There is a significant relationship between the household income of the family and the incidence of lifestyle diseases

Factor Isolating Question

- What is the profile of the respondent families in terms of:
  - Household income;
  - Incidence of lifestyle diseases?

Factor relating question

- What is the relationship between a family's household income and the incidence of lifestyle diseases?

Situation-relating Question

- To what extent is the income of a family related to the incidence of lifestyle diseases?

Situation-producing Question

- What plans can be implemented to lessen the incidence of lifestyle diseases caused by a high household income?

Level 1 Inquiry

- What is the profile of the respondent families in terms of:
  - Household income;
  - Incidence of lifestyle diseases?

Level 2 Inquiry

- What is the relationship between a family's household income and the incidence of lifestyle diseases?

Level 3 Inquiry

- Why is there a relationship between the income of a family and the incidence of lifestyle diseases?

Tentative Title

- Household Income and Incidence of Lifestyle Diseases in the Filipino Family: An Analysis

Variables

- IV: household income
- DV: incidence of lifestyle diseases

Quiz

- April wants to know if gender and civil status of a student affects the performance in the board exam. Formulate the following based on the said situation:
  - Hypothesis as to the following types:
    - Null hypothesis
    - Nondirectional Alternative hypothesis
    - Positive directional Alternative hypothesis
    - Negative directional Alternative hypothesis
  - Research questions as to the following types:
    - Factor-isolating questions
    - Factor-relating questions
    - Situation-relating questions
    - Situation-producing questions
  - Research questions as to the following levels of inquiry:
    - Level 1
    - Level 2
    - Level 3
  - Formulate a title for the problem mentioned above.
  - Identify the independent and dependent variables in the title you have formulated.

Null Hypothesis

- There is no significant relationship between the gender and civil status of the respondents and their performance in the board exam

Alternative Hypothesis

- There is a significant relationship between the gender and civil status of the respondents and their performance in the board exam

Positive Directional

- Gender is a better indicator than civil status in passing the board exam.

Negative Directional

- Civil status is a not a better indicator than gender in passing the board exam.

Factor Isolating Question

- What is the profile of the respondents in terms of:
  - Gender;
  - Civil status;
  - Board examination score?

Factor relating question

- What is the relationship between the gender and civil status of the respondents and their performance in the board exam?

Situation-relating Question

- To what extent is the board exam performance affected by the gender and civil status of the respondents?

Situation-producing Question

- What can be done to improve the board exam performance of the respondents?
- OR
- What can be done to lessen the impact of age and civil status in the board exam?

Level 1 Inquiry

- What is the profile of the respondents in terms of:
  - Age;
  - Gender;
  - Board examination score?

Level 2 Inquiry

- What is the relationship between the gender and civil status of the respondents and their performance in the board exam?

Level 3 Inquiry

- Why is there a relationship between the gender and civil status of the respondents and their performance in the board exam?

Tentative Title

- The Effect of Gender and Civil Status on the Board Examination Performance
- OR better yet,
- Determinants of Board Examination Performance

Variables

- IV: gender
  civil status
- DV: board exam performance