Chapter 7
Hypothesis and Research Questions

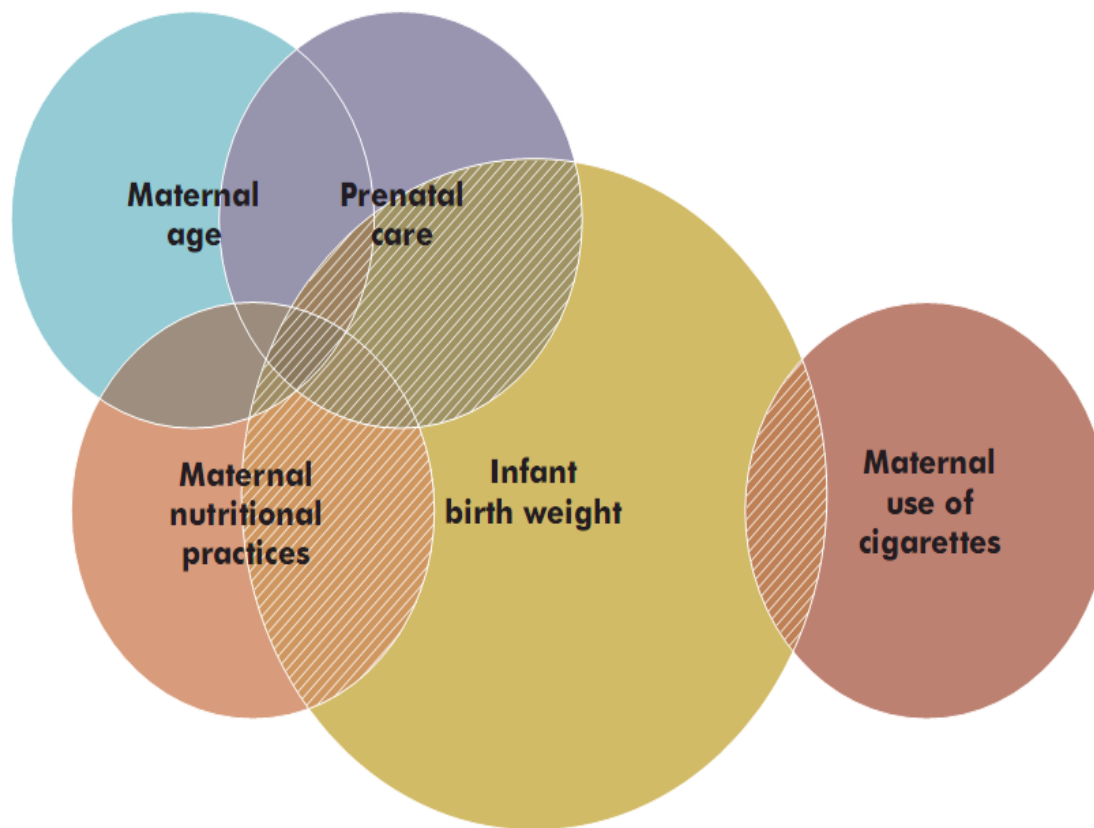**2023**

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FIGURE 2.1
Hypothetical representation of factors affecting infant birth weight.

Maternal age

Prenatal care

Maternal nutritional practices

Infant birth weight

Maternal use of cigarettes

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A hypothesis:

- States an expectation, a predicted answer to the research question
- Should almost always involve two or more variables
- Suggests the predicted relationship between the independent variable and the dependent variable.
- "tentative prediction or explanation of the relationship between two or more variables"
- Always written before the study, should not be changed after the study results are examined

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Purpose of hypothesis

- Provide objectivity
- The theoretical proposition can be tested in the real world.
- Guide the research design.
- Direct the statistical analysis.

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Source and rational of hypothesis

- Personal experience

- Observation

- Previous literature

- Theory

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Classification of hypothesis
1. Simple and complex

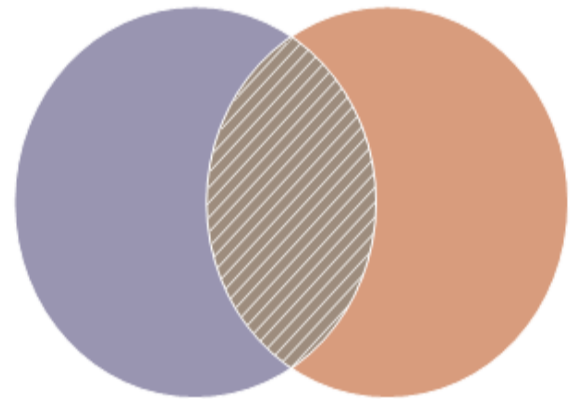| **Simple**	**Complex**
• State a relationship between one independent variable and one dependent variable.	• State a relationship between two or more independent variables, two or more dependent variables are being examined in the same study

Example of a simple hypothesis:
Patients receiving a warmed solution for body cavity irrigation during surgical procedures [X] will maintain a higher core body temperature [Y] than patients receiving a room temperature solution (Kelly, Doughty, Hasselbeck, & Vacchiano, 2000).
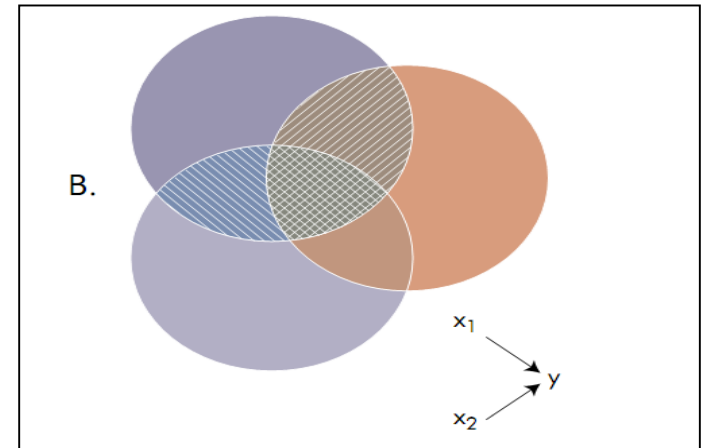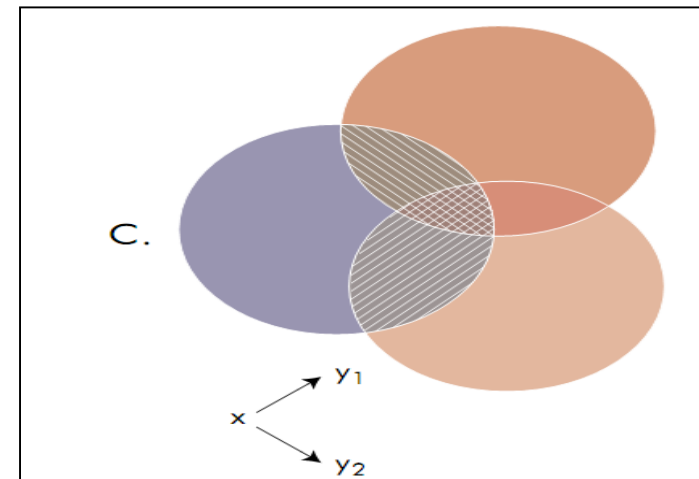
A.

x ⟶ y

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Example of a complex hypothesis—multiple independent variables:

Among breast cancer survivors, emotional well-being [Y] is influenced by the women's self-esteem [X_1], their resourcefulness [X_2] and their degree of social support [X_3] (Dirksen, 2000).

B.

Example of a complex hypothesis—multiple dependent variables:

The implementation of an evidence-based protocol for urinary incontinence [X] will result in decreased frequency of urinary incontinence episodes (Y_1), decreased urine loss per episode [Y_2], and decreased avoidance of activities [Y_3] among women in ambulatory care settings (Sampselle et al., 2000).

C.

Classification of hypothesis
2. Directional and Non-Directional

• **<u>Directional</u>**	• **<u>Non directional</u>**
• Prediction of the type of relationship between variable • "More than" • "Less than" • "Decrease"	• Prediction that a relationship exists

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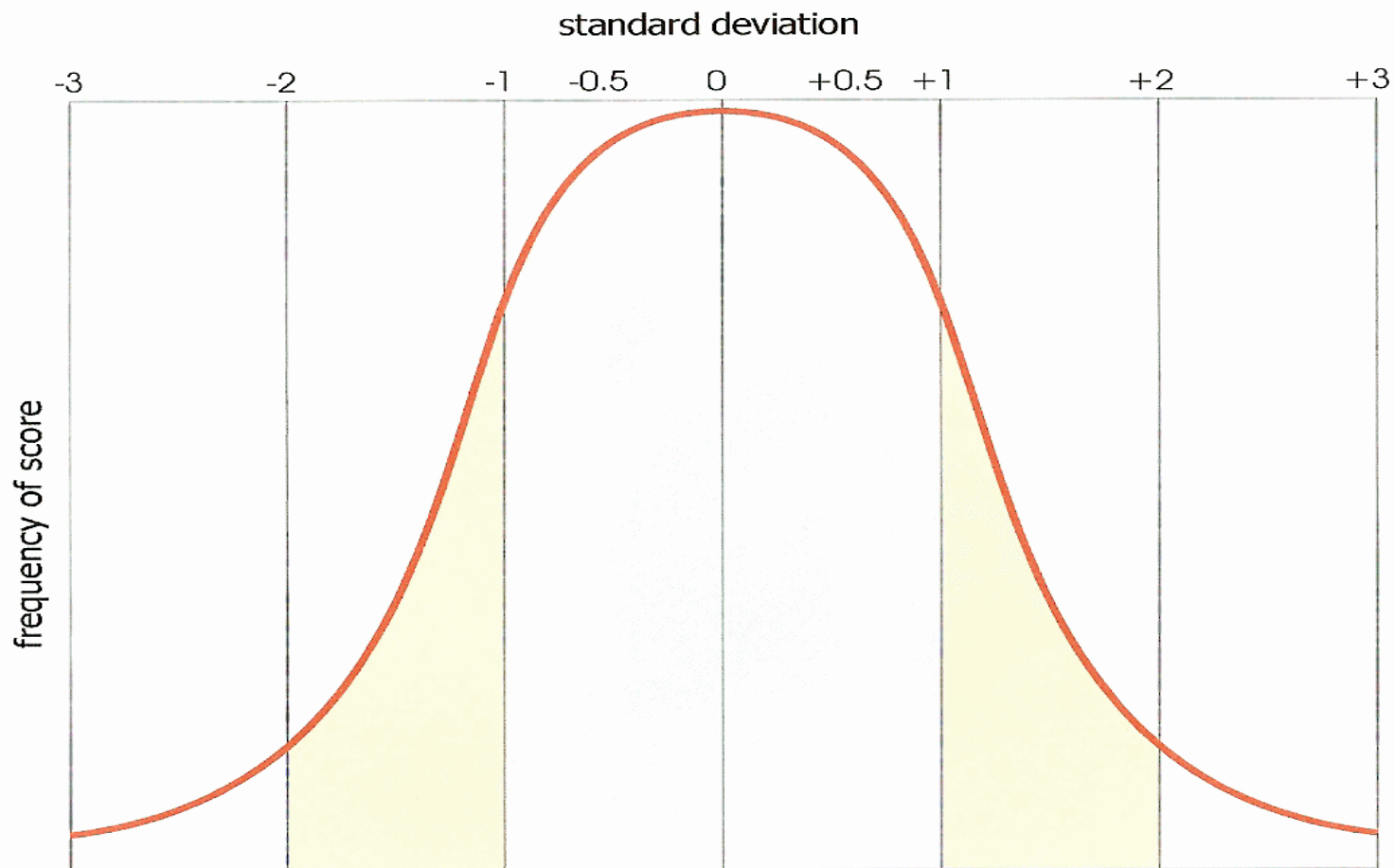
Classification of Hypothesis
3. Null and Research Hypothesis

• **Null or statistical Hypothesis (Ho).** • Predict that there is no relationship presents between variables. • Null hypothesis subjected to statistical analysis. • The aim of researcher to reject null hypothesis	• **Research or alternative hypothesis. (H1).** • States the expected relationship between variables.

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standard deviation

frequency of score

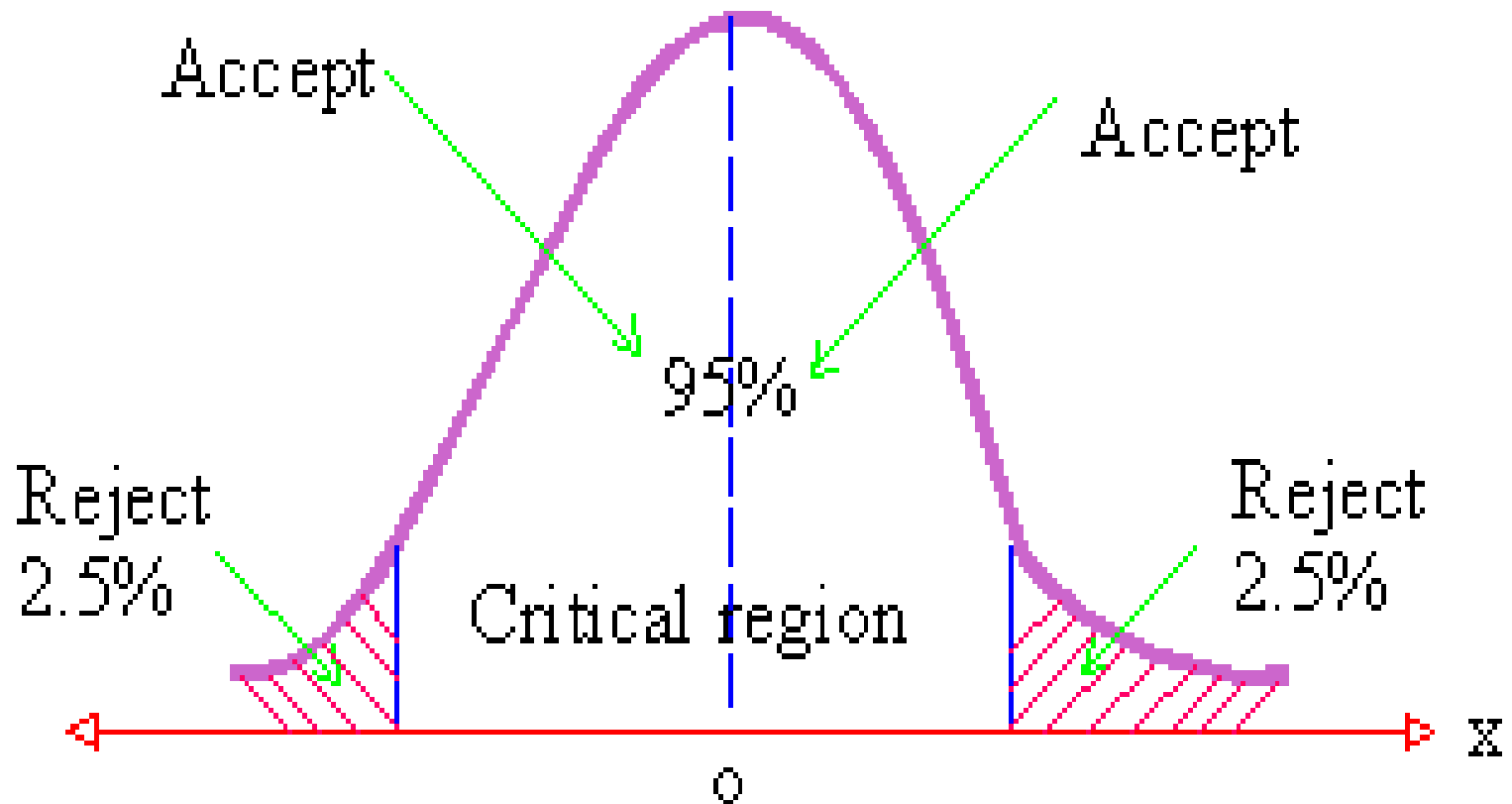least suitable candidates   most suitable candidates

95% of the population lie between -2 and +2 standard deviations
68% of the population lie between -1 and +1 standard deviations
31% of the population lie between -.5 and +.5 standard deviations

criteria to be considered when formulating a hypothesis

A hypothesis should:

- be written in a declarative sentence
- be written in the present tense
- Hypotheses are tested in the present
- specify the population to be studied
- reflect the problem statement or the purpose statement
- contain all the variables
- be empirically testable
- Ethical and value issues are not empirically testable and must be avoided.

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Hypothesis testing

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Examples

Hypotheses	(1) Subjects receiving antiemetic therapy by a patient-controlled pump will report less nausea than subjects receiving the therapy by nurse administration; (2) subjects receiving antiemetic therapy by a patient-controlled pump will vomit less than subjects receiving the therapy by nurse administration; (3) subjects receiving antiemetic therapy by a patient-controlled pump will consume less medication than subjects receiving the therapy by nurse administration.

Examples

- Elderly patients who are praised (reinforced) by nursing personnel for self-feeding require less assistance in feeding than patients who are not praised.
- Pediatric patients who are given a reward (e.g., a balloon or permission to watch television) when they cooperate during nursing procedures tend to be more obliging during those procedures than nonrewarded peers.

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Examples

Pregnant women who receive prenatal instruction regarding postpartum experiences are not likely to experience postpartum depression.

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Hypothesis Examples.

- **Birth weight is lower among infants of alcoholic mothers than among infants of nonalcoholic mothers.**

- **The greater the degree of sleep deprivation, the higher the anxiety level of the ICU patients**

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Hypothesis exercise

- **Daily weight loss is greater for adults who follow a reduced calorie diet and exercise daily than those who do not follow a reduced calorie diet and do not exercise daily**

- **The level of job mobility is different for psychiatric nurse than for medical surgical nurse.**

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Hypothesis exercise

- **More postpartum depression and feeling of inadequacy are reported by women who give birth by caesarean delivery than by those who deliver normally**.

- **There is a negative relationship between denial and reports of anxiety among post myocardial infarction patients.**

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Example

- Problem statement: is there a change in the anxiety level of preoperative patient after listening to relaxation tape?

- Hypothesis: there is a change in the anxiety level of preoperative patients after listening to a relaxation tape.

- Preoperative anxiety level will decrease after listening to relaxation tape.

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Hypothesis criteria

- Written in declarative sentence

- Written in the present tense

- Contains the population

- Contains the variables

- Reflect the problem statement

- Is empirically testable.

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Find the independent and dependent variables

- Male appendectomy patients request more pain medication on the first postoperative day than do female appendectomy patients

- There is a relationship between the number of prenatal classes attended by pregnant women and their degree of fear concerning labor and delivery

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Find the independent and dependent variables

- The infants born to heroin addicted mothers have lower birth weight than infants of non addicted mothers.

- There is a relationship between tactile and auditory stimulation and heart rate response in premature infants.

- Older nurses are less likely to express approval of the expanding role of nurses than younger nurses.