The Psychological Approach

Studying Human Mind: Structure vs function

- Structure
  - Describe ‘elements’ of thought
  - Voluntarism
  - Structuralism
- Functionalism
  - Away from parts
  - How parts interrelate/function
    - Psycho-Analytic
    - Gestalt
    - Cognitive
    - Neuroscience
  - Behaviorism

Inspirations, Connections and Reactions

The use of analogy is a common method of explanation

Structuralism
- Chemistry and Physics

Gestalt
- Field Theory

Reactions:
- Structuralism -> Functionalism & Gestalt
- All previous ‘isms’ -> Behaviorism

Voluntarism

Goal: Identify Mental Elements
Elements combined together with ‘Will’
Influenced by Chemistry
Immediate : Direct experience
Mediate: Reflected upon experience
Tridimensional Theory of feelings
- Pleasant vs unpleasant
- Tense verse relaxed
- Excited versus depressed

Categorize: Regret, disgust, awe, envy, shadenfreude

Introspection is technique
Problems with Introspection?

Problems with Method of Introspection

Introspection might change process
Process may change over time
Process may be inaccessible
Subject agreement
Language may be inadequate

Voluntarism 2.0: Structuralism

More careful cataloging of elements
- 32,820 visual
- 11,600 auditory

More passive combination

Dimensions:
- Quality
- Intensity
- Duration
- Clearness
- Extension

How do these map unto our current understanding of neural function?

Criticisms same as voluntarism

Ignored whole experience, which leads to…

Functionalism

Mind is not elements but rather a ‘dynamic process’

- ‘stream of consciousness’
- Maps onto neural firing basis of mind

Substantive thoughts

- Focused attention when mind slows down

Transitive thoughts

- flights of fancy, mind drifts and associates

Criticism: What is a function/activity?

- Is it activity like perception or memory?
- Is it the usefuleness of mental process?

Gestalt Movement

Focus on whole versus parts

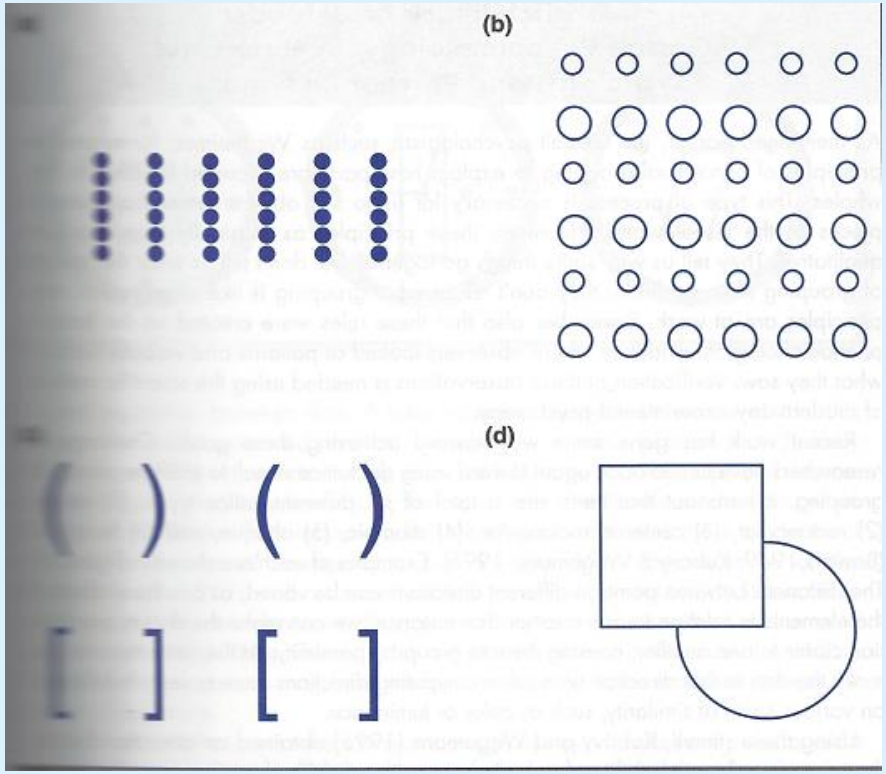
Grouping principles

A) Proximity

B) Size

C) Closure

D) Pragnanz (Good figure)



Gestalt Movement: Insight Learning

Stages of Learning:

- Preparation
- Incubation
- Illumination (“Aha”)
- Verification

Gestalt Movement: Criticisms

Explanations seen as just descriptive
Competition of Grouping principles in real world
Definition of ‘pragnanz’
Insight learning is not present in many real world studies

Psychoanalytic Theory: Mini-Minds

Conscious (tip of iceberg above surface)
Preconscious (just below surface)
Subconscious (largest part of iceberg)

Id (Wants)
Superego (Moral Ideals)
Ego (Mediates Id and Super Ego)

Defense Mechanisms
- Repression
- Sublimation

Psychoanalytic Theory: Criticisms

Painful memories not repressed but everpresent
Analytic treatments not appropriate for many disorders (e.g. anxiety disorders)
Unscientific and low in predictability

Behaviorism

Minimizes ‘mind’ and just looks at behaviors

Observables
- Stimulus and response

Method
- Well-controlled experiments using animals

Focused on learning

Behaviorism: Elements

Stimulus -> “black box” -> response

Classical Conditioning

Before training

Unconditioned Stimulus -> Unconditioned Response

During training

Conditioned Stimulus & Unconditioned Response

After training

Conditioned Stimulus -> Conditioned Response

After time link between CS and CR often weaken

Example: Vegas engagement

Behaviorism: Elements

Operant Conditioning

- Reinforcement
  - Positive
  - Negative
- Punishment

Example: Dog barking jingle bells

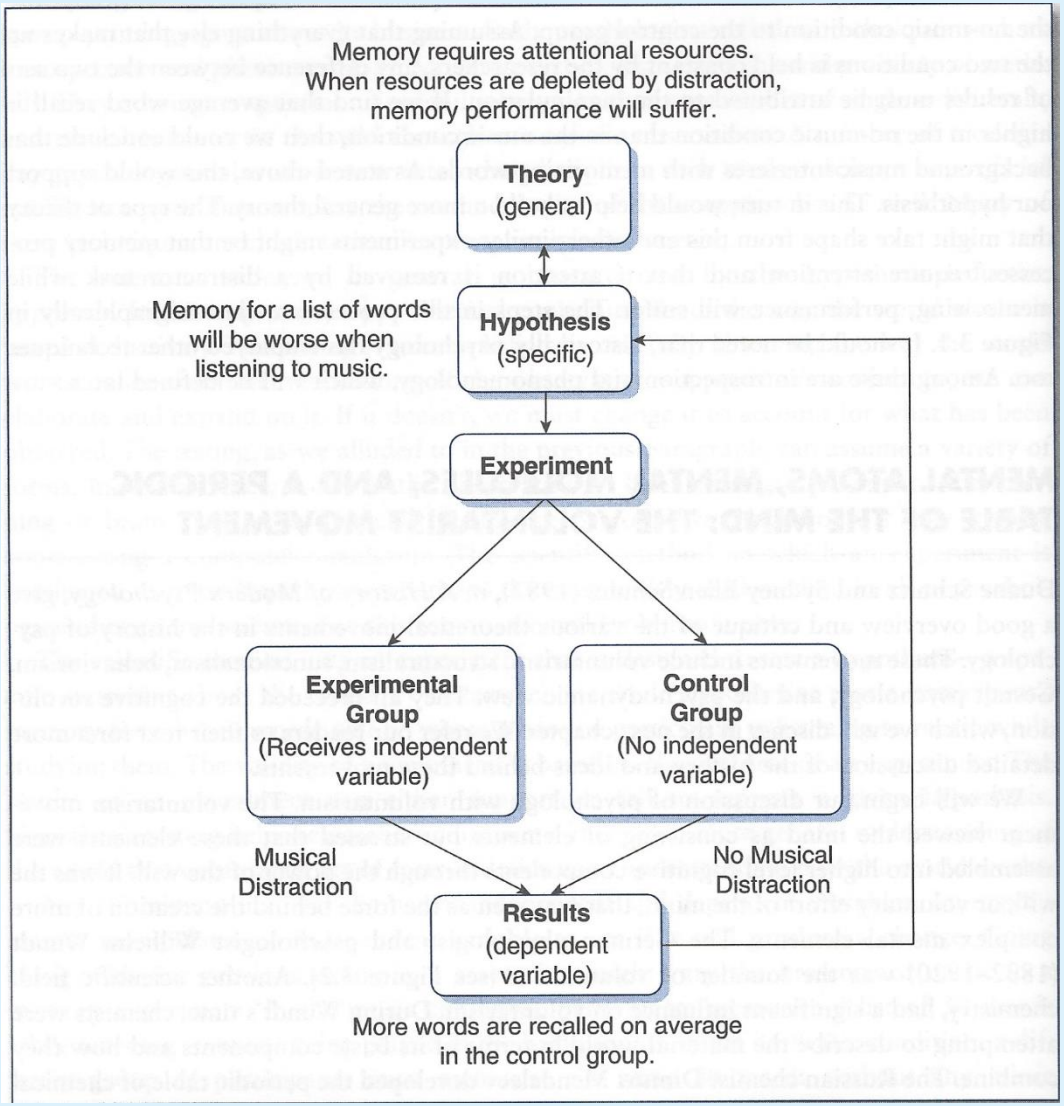
Behaviorism: Strengths and Weaknesses

Minimizes ‘mind’ and just looks at behaviors

Strengths
- Good experiments
- Good theories
- Predicted behavior

Weaknesses
- Could not explain complex behavior
  - Perception
  - Language
  - High-level thought
  - Attention

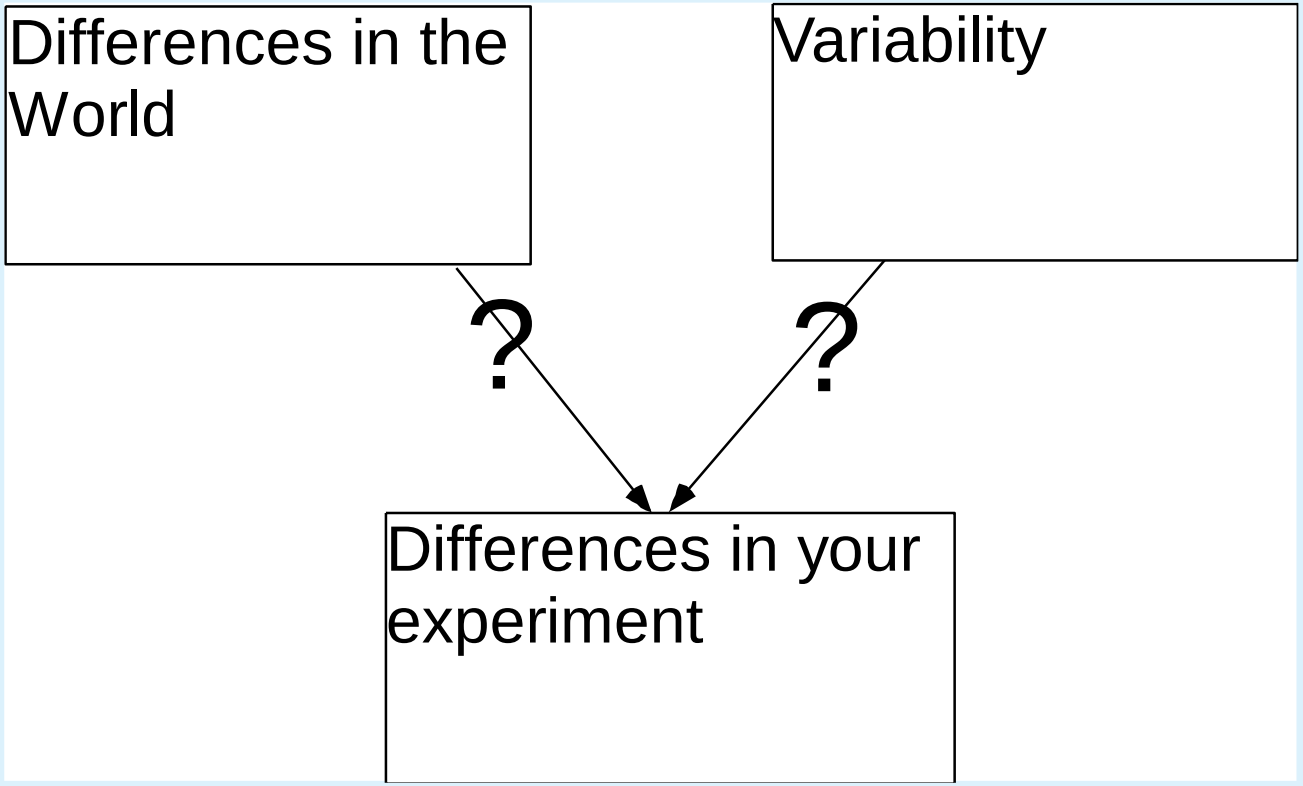
Scientific Method



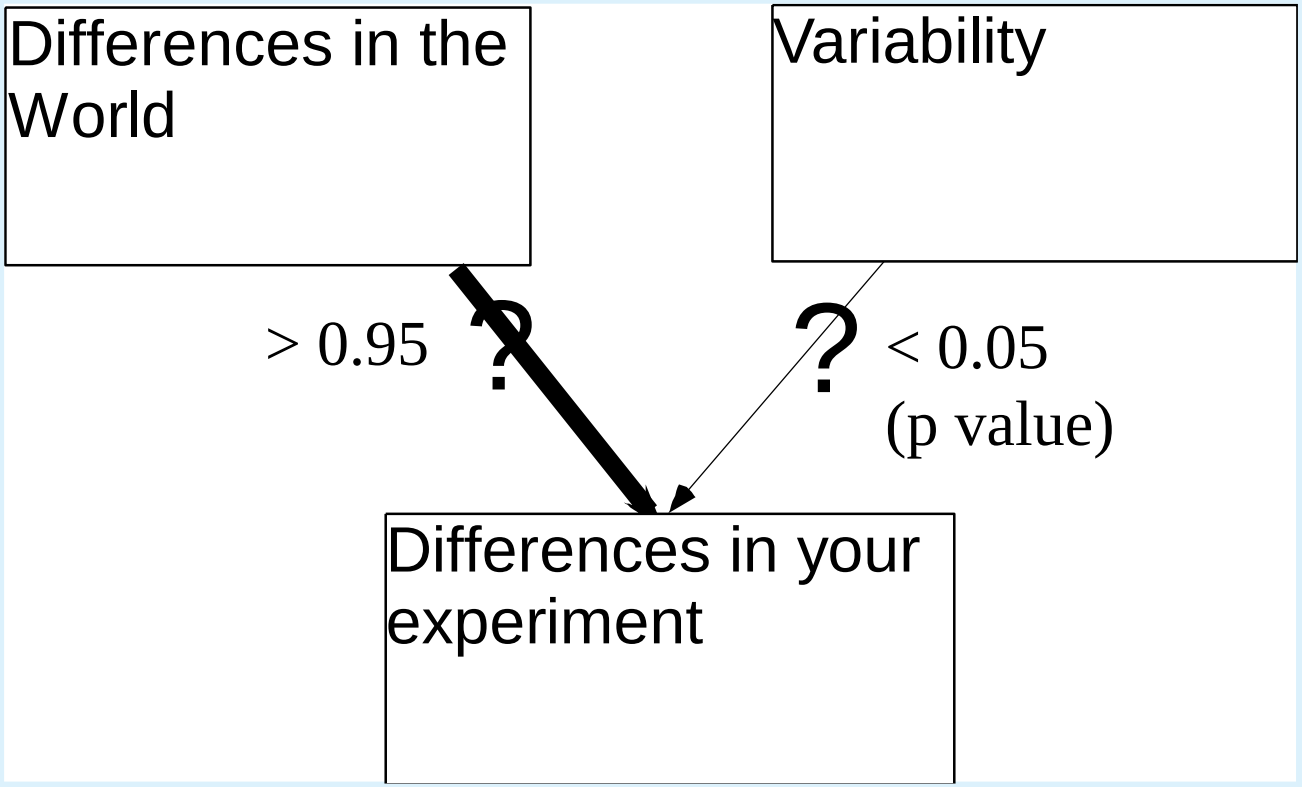
Scientific Method: Comparing Experimental and Control Groups

Need statistics to compare dependent variable of groups
Samples used to make inferences about populations
Almost always differences in dependent variables
    Variability
        Between individuals
        Within Individuals
What is the likely cause of the differences between groups?

Scientific Method: Comparing Experimental and Control Groups



Scientific Method: Comparing Experimental and Control Groups



Scientific Method: Comparing Experimental and Control Groups

What effects p value?

Variability (lower is better)

Difference in Means (higher is better)

Scientific Method: Comparing Experimental and Control Groups

When might p value be misleading?

P value assumes ‘blank slate’ before experiment

The curious case of Daryl Bem and precognition

Scientific Method: Comparing Experimental and Control Groups

Bayesian approach

- **Assume some prior probability**
- **Change ‘p value’ needed**

Non Random-Assignment Experiments

Correlation and causation

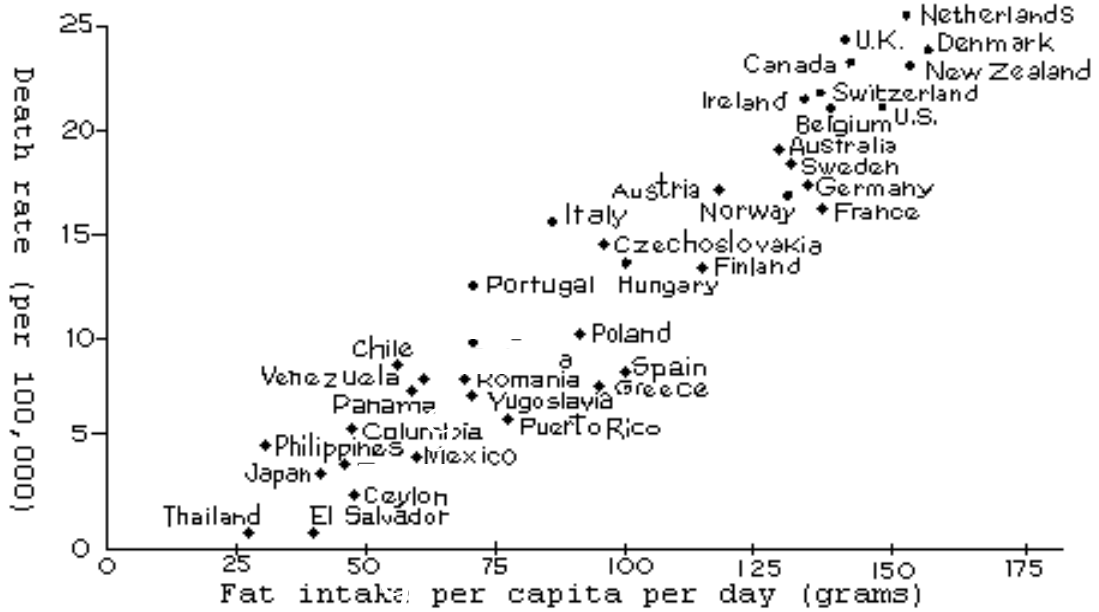
Correlation: statistical measure of association

What is the cause?

- **Minister Salaries and Rum Price (+)**
- **Children: Arm Length and Reasoning ability (+)**
- **Bottled Water Consumption and Baby Health (+)**
- **Espresso Machine expenditure and Baby Health (+)**
- **Cigarette Smoking and GPA (-)**
- **Women: Foot angle and Age (+)**
- **Months of Breast Feeding and IQ (+)**

Non Random-Assignment Experiments

Figure 8. Cancer rates plotted against fat in the diet for a sample of countries



Source: K. Carroll. "Experimental evidence of dietary factors and hormone-dependent cancers Cancer Research vol. 35 (1975) p.3379. Copyright by Cancer Research. Reproduced by permission