Introduction
**Verbal Behavior About the Science (Content Expertise)**

*Introduction and Basic Concepts* (or alternative) quiz to 90% mastery criterion from the list of acceptable readings attached to this rank. Supervisor specify alternative unit:
Chapter 1 - Definition and Characteristics of ABA

Chapter 2 - Basic Concepts
Chapter 1: Definition and Characteristics of Applied Behavior Analysis
Basic Characteristic of Science

• Systematic approach for seeking & organizing knowledge about the natural world

• Purpose
  • To achieve a thorough understanding of the phenomena under study
    • ABA – socially important behaviors
  • Seeks to discover the real truths (not those held by certain groups, organizations, etc.)
Basic Characteristic of Science

• Three different types of investigations provide different levels of understanding:
  • Description
  • Prediction
  • Control

• Each level contributes to the overall knowledge base in a given field
Basic Characteristic of Science

• Description
  • Collection of facts about observed events that can be quantified, classified, & examined for possible relations with other known facts
  • Often suggests hypotheses or questions for additional research
Basic Characteristic of Science

• Prediction
  • Relative probability that when one event occurs, another event will or will not occur
  • Based on repeated observation revealing relationships between various events
  • Demonstrates correlation between events
  • No causal relationships can be interpreted
  • Enables preparation
Basic Characteristic of Science

• Control
  • Highest level of scientific understanding
  • Functional relations can be derived
    • Specific change in one event (dependent variable)....
    • Can reliably be produced by specific manipulations of another event (independent variable)...
    • And the change in the dependent variable was unlikely to be the result of other extraneous factors (confounding variables)
Basic Characteristic of Science

• Control (continued)
  • Events can only really be “co-related”
  • Nearly impossible to factor out all other possible “causes”
Attitudes of Science

• Science as a set of attitudes (Skinner, 1953)
• Definition of science lies within the behavior of scientists, not the instruments or materials they use
• Only known as science due to an overriding idea of “scientific method”
  • Fundamental assumptions about the nature of events
Attitudes of Science

• Scientific attitudes that guide the work of all scientists include:
  • Determinism
  • Empiricism
  • Experimentation
  • Replication
  • Parsimony
  • Philosophic doubt
Attitudes of Science: Determinism

- Assumption upon which science is predicted
- Presumption that the universe is a lawful and orderly place in which all phenomena occur as the result of other events
- Events do not just occur at will
- Events are related in systematic ways
Attitudes of Science: Empiricism

• Practice of objective observation of phenomena of interest
• What all scientific knowledge is built upon
• “Objective” is the key to gaining a better understanding of what is being studied
Attitudes of Science: Experimentation

• Basic strategy in most sciences

• Experiment:
  • Controlled comparison of some measure of the phenomenon of interest (dependent variable) under two or more different conditions in which only one factor at a time (independent variable) differs from one condition to another
Attitudes of Science: Replication

- The repetition of experiments to determine the reliability and usefulness of findings
- Includes the repetition of independent variable conditions within experiments
- Method for which mistakes are discovered
Attitudes of Science:
Parsimony

• The idea that simple, logical explanations must be ruled out, experimentally or conceptually, before more complex or abstract explanations are considered

• Help scientists fit findings within the field’s existing knowledge base
Attitudes of Science: Philosopich Doubt

• The continuous questioning of the truthfulness and validity of all scientific theory and knowledge

• Involves the use of scientific evidence before implementing a new practice, then constantly monitoring the effectiveness of the practice after its implementation
A Definition of Science

• Science is...
  • A systematic approach to the understanding of natural phenomena...
  • As evidenced by description, and control...
  • That relies on determinism as its fundamental assumption...
  • Empiricism as its prime directive...
  • Experimentation as its basic strategy...
  • Replication as its necessary requirement for believability...
  • Parsimony as its conservative value...
  • And philosophic doubt as its guiding conscience.
Development of Applied Behavior Analysis

• Behavior analysis is comprise of three major branches
  • Behaviorism
    • Philosophy of the science of behavior
  • Experimental analysis of behavior (EAB)
    • Basic research
  • Applied behavior analysis (ABA)
    • Development of a technology for improving behavior
    • Can only be understood in the context of the philosophy & basic research traditions & findings
Development of Applied Behavior Analysis

• Psychology in the early 1900’s was dominated with the study of states of consciousness, images, & other mental processes
Development of Applied Behavior Analysis

• Watson is recognized as moving the field of psychology in a new direction
  • Argued that subject matter for psychology should be the study of observable behavior, not states of mind or mental processes
  • Early form of behaviorism known as stimulus-response (S-R) psychology (Watsonian behaviorism)
  • Created foundation for the study of behavior as a natural science
Development of Applied Behavior Analysis

• B.F. Skinner’s *The Behavior of Organisms* (1938/1966)
  • Formally began the experimental branch of behavior analysis
  • Summarized his laboratory research from 1930-1937
  • Discussed two types of behavior
    • Respondent
    • Operant
Development of Applied Behavior Analysis

• Respondent behavior
  • Reflexive behavior
  • Ivan Pavlov (1927/1960)
  • Respondents are elicited (“brought out”) by stimuli that immediately precede them
  • Antecedent stimulus & response it elicits form a functional unit called a reflex
  • Involuntary responses
  • Occur whenever eliciting stimulus is present
  • S-R model
Development of Applied Behavior Analysis

- Operant behavior
  - Behavior is shaped through the consequences that immediately follow it
  - Three term contingency
  - S-R-S model
  - Behaviors that are influenced by stimulus changes that have followed the behavior in the past
Development of Applied Behavior Analysis

• Experimental analysis of behavior (EAB)
  • Named as a new science by Skinner
  •Outlined specific methodology for its practice:
    • The rate or frequency of response is the most common dependent variable
    • Repeated or continuous measurement is made of carefully defined response classes
    • Within-subject experimental comparisons are used instead of designs comparing the behavior of experimental & control groups
Development of Applied Behavior Analysis

• Experimental analysis of behavior (EAB)
  • Specific methodology for its practice (continued):
    • Visual analysis of graphed data is preferred over statistical inference
    • A description of functional relations is valued over formal theory testing
Development of Applied Behavior Analysis

• Skinner & colleagues conducted many laboratory experiments between the 1930’s - 1950’s
  • Discovered & verified basic principles of operant behavior
  • Same principles continue to provide the empirical foundation for behavior analysis today
Development of Applied Behavior Analysis

• B.F. Skinner
  • Founder of experimental analysis of behavior
  • Wrote extensively
    • Very influential in the guiding practice of the science of behavior & in proposing the application of the principles of behavior to new areas
    • Walden Two (1948)
    • Science and Human Behavior (1953)
    • About Behaviorism (1974)
  • Philosophy of science became known as radical behaviorism
Development of Applied Behavior Analysis

• Radical behaviorism
  • Attempts to explain all behavior, including private behavior (e.g. thinking & feeling)

• Methodological behaviorism
  • Philosophical position that considers behavioral events that cannot be publicly observed to be outside the realm of the science
Development of Applied Behavior Analysis

• Mentalism
  • Approach to understanding behavior that assumes that a mental or “inner” dimension exists that differs from a behavioral dimension & that phenomena in this dimension either directly cause or at least mediate some forms of behavior
  • Relies on hypothetical constructs and explanatory fictions
  • Dominated Western intellectual thought & most psychological theories (e.g. Descartes, Freud, Piaget)
Development of Applied Behavior Analysis

• Mentalism (continued)
  • Relies on the premise of explanatory fiction (e.g. “knowledge”)
    • A fictitious variable that often is simply another name for the observed behavior that contributes nothing to an understanding for the variables responsible for developing (or maintaining) the behavior
  • Circular view of the cause & effect
Development of Applied Behavior Analysis

• Structuralism
  • Rejects all events that are not operationally defined by objective assessment
  • Restrict activities to descriptions of behavior
  • Make no scientific manipulations; do not address causal questions
Development of
Applied Behavior Analysis

• Methodological behaviorism
  • Rejects all events that are not operationally defined by objective assessment
    • Deny existence of “inner variables” or consider them outside the realm of scientific account
    • Acknowledge the existence of mental events but do not consider them in the analysis of behavior
  • Use scientific manipulations to search for functional relationships between events
  • Restrictive view since it ignores major areas of importance
Development of Applied Behavior Analysis

• Skinner did not object to cognitive psychology’s concern with thoughts & feelings (i.e. events taking place “inside the skin”)  
• Referred to these as “private events”  
• They are behavior to be analyzed with the same conceptual & experimental tools used to analyze publicly observable behavior
Development of Applied Behavior Analysis

• Radical behaviorism (Skinner’s behaviorism) makes three assumptions about the nature of private events
  • Private events such as thoughts and feelings are behavior
  • Behavior that takes place within the skin is distinguished from other (‘public’) behavior only by its inaccessibility
  • Private behavior has no special properties & is influenced by (i.e. is a function of) the same kinds of variables as publicly accessible behavior
Development of Applied Behavior Analysis

- Radical behaviorism (Skinner’s behaviorism)
  - Includes & seeks to understand all human behavior
  - Far-reaching & thoroughgoing
  - Dramatic departure from other conceptual systems
Development of Applied Behavior Analysis

• Fuller (1949)
  • One of the first studies to report the human application of operant behavior
  • Participant: 18-year-old boy with profound mental retardation
  • Arm-raising response was conditioned by injecting a small amount of a warm sugar-milk solution into participant’s mouth every time he moved his right arm
Development of Applied Behavior Analysis

• Ayllon & Michael (1959)
  • “The Psychiatric Nurse as a Behavioral Engineer”
  • Formed the basis for branch of behavior analysis that would later be called applied behavior analysis (ABA)
  • Described techniques based on principles of behavior to improve the functioning of chronic psychotic or mentally retarded residents
Development of Applied Behavior Analysis

• 1960’s
  • Researchers began to apply principles of behavior in an effort to improve socially important behavior
  • Techniques for measuring behavior & controlling & manipulating variables were sometimes unavailable, or inappropriate
  • Little funding was available
  • No ready outlet for publishing studies
    • Difficult to communicate findings
Development of Applied Behavior Analysis

• Despite limitations in the 1960’s many applications of behavior principles were made

• Application of behavior principles to education is a major area of impact

• Provided the foundation for:
  • behavioral approaches to curriculum design
  • instructional methods
  • classroom management
  • generalization and maintenance of learning
Development of Applied Behavior Analysis

• 1960’s & 1970’s
  • Many new university programs were developed in applied behavior analysis
  • Teaching & research conducted in these programs made major contributions to the rapid growth of the field
Development of Applied Behavior Analysis

• 1968 – Formal beginning of contemporary applied behavior analysis
  • Journal of Applied Behavior Analysis (JABA) began publication
  • “Some Current Dimensions of Applied Behavior Analysis” (Baer, Wolf, & Risley)
Development of
Applied Behavior Analysis

• Journal of Applied Behavior Analysis (JABA)
  • First journal in U.S. To deal with applied problems & gave researchers using methodology from the experimental analysis of behavior an outlet for publishing their findings
  • Flagship journal of ABA
Development of
Applied Behavior Analysis

• “Some Current Dimensions of Applied Behavior Analysis” (Baer, Wolf, & Risley)
  • Founding fathers of the new discipline (ABA)
  • Defined the criteria for judging adequacy of research & practice in ABA & outlined the scope of work for those in the science
  • Most widely cited publication in ABA
  • Remains standard description of the discipline
Defining Characteristics of Applied Behavior Analysis

- Baer, Wolf, and Risley (1968) recommended the following seven defining dimensions for research or behavior change programs:
  - Applied
  - Behavioral
  - Analytic
  - Technological
  - Conceptual
  - Effective
  - Generality
Defining Characteristics of Applied Behavior Analysis

- Applied
  - Investigates socially significant behaviors with immediate importance to the participant(s)
  - Examples include behaviors such as:
    - Social
    - Language
    - Academic
    - Daily living
    - Self-care
    - Vocational
    - Recreation and/or leisure
Defining Characteristics of Applied Behavior Analysis

• Behavioral
  • Precise measurement of the actual behavior in need of improvement & documents that it was the participant’s behavior that changed
    • The behavior in need of improvement and it is a study of behavior (not about behavior)
    • The behavior must be measurable
    • Important to note whose behavior has changed
Defining Characteristics of Applied Behavior Analysis

• Analytic
  • Demonstrates experimental control over the occurrence and non-occurrence of the behavior (a functional relation is demonstrated)
  • Functional & replicable relationships
Defining Characteristics of Applied Behavior Analysis

• Technological
  • Written description of all procedures in the study is sufficiently complete and detailed to enable others to replicate it
  • All operative procedures are identified and described in detail & clarity
  • Replicable technology
Defining Characteristics of Applied Behavior Analysis

• Conceptually systematic
  • Behavior change interventions are derived from basic principles of behavior
  • Better enable research consumer to derive other similar procedures from the same principle(s)
  • Assist in integrating discipline into a system instead of a “collection of tricks”
Defining Characteristics of Applied Behavior Analysis

• Effective
  • Improves behavior sufficiently to produce practical results for the participant(s)
  • Improvements in behavior must reach clinical or social significance
  • Extent to which changes in the target behavior(s) result in noticeable changes
Defining Characteristics of Applied Behavior Analysis

• Generality
  • Produces behavior changes that last over time...
  • Appear in other environments (other than the one in which intervention was implemented)...
  • Or spread to other behaviors (those not directly treated by the intervention)
Additional Characteristics of Applied Behavior Analysis

• Offers society an approach toward solving problems that is:
  • Accountable
  • Public
  • Doable
  • Empowering
  • Optimistic
Additional Characteristics of Applied Behavior Analysis

• Accountable
  • Created by the focus on
    • Accessible environmental variables that reliably influence behavior
    • Reliance on direct & frequent measurement to detect changes in behavior
      • Detect successes and failures
      • Allow changes to be made
Additional Characteristics of Applied Behavior Analysis

• Public
  • Visible, explicit, & straightforward
  • Of value across a very broad spectrum of fields
Additional Characteristics of Applied Behavior Analysis

• Doable
  • Not prohibitively complicated or arduous
  • Variety of individuals are able to implement principles and interventions
  • Does involved more that learning to do some procedures
Additional Characteristics of Applied Behavior Analysis

• Empowering
  • Provides practitioners with real tools that work
  • Raises confidence
  • Increases confidence for future challenges
Additional Characteristics of Applied Behavior Analysis

• Optimistic
  • Possibilities for each individual (Strain et al., 1992)
  • Detect small improvements
  • Positive outcomes yield a more optimistic attitude about future successes
  • Peer-reviewed literature provides many examples of success
Definition of Applied Behavior Analysis

• Applied behavior analysis is:
  • A scientific approach to improving socially significant behavior...
  • In which procedures derived from the principles of behavior are systematically applied to improve socially significant behavior...
  • And to demonstrate experimentally that the procedures employed were responsible for the improvement in behavior
Definition of Applied Behavior Analysis

• Six key components:
  • Guided by attitudes of methods of scientific inquiry
  • All behavior change procedures are described & implemented in a systematic, technological manner
  • Only procedures conceptually derived from the basic principles of behavior are circumscribed by the field
  • Focus is socially significant behavior
  • Seeks to make meaningful improvement in important behavior
  • Seeks to produce an analysis of the factors responsible for improvement
Domains of Behavior Analytic Science

• Four domains
  • Behaviorism
  • Experimental analysis of behavior (EAB)
  • Applied behavior analysis (ABA)
  • Professional practice

• Behavior analysts may work in one or more of the four domains

• Domains are very interrelated & influence one another
Domains of Behavior Analytic Science

• Behaviorism
  • Theoretical & philosophical issues
  • Conceptual basis of behavior principles as it relates across many spectrums
Domains of Behavior Analytic Science

• Experimental analysis of behavior (EAB)
  • Basic research
  • Experiments in laboratory settings with both human participants and nonhuman subjects
  • Goal of discovering & clarifying fundamental principles of behavior
Domains of Behavior Analytic Science

• Applied behavior analysis (ABA)
  • Applied research
  • Experiments are aimed at discovering & clarifying functional relations between socially significant behavior & its controlling variables
  • Desire to contribute to further development of a humane & effective technology of behavior change
Domains of Behavior Analytic Science

• Professional practice
  • Providing behavior analytic services to consumers
  • Design, implement, & evaluate behavior change programs that consist of behavior change tactics derived from fundamental principles of behavior
    • Discovered by basic researchers
    • Experimentally validated for their effects on socially significant behavior by applied researchers