

# Quantitative Methods

- **Dependent Variable - fundamental motor competence: locomotor & object control**
- **Why Test of Gross Motor Development-2**
  - Age range 3-11 years
  - Normed over a national sample in USA
  - Measures FMS competence that uses skills that have direct relationship to PE curriculum
  - Easy to administer
  - Does not require specialized equipment
  - Can be done in the school site

# Quantitative Methods

## ➤ **Independent Variable - Intervention**

- Describe in detail so the reader knows what the experimental manipulation is:
  - Experimental condition=Preschool program + SKIP motor skill program
  - Control condition=preschool program alone
  - Describe the “dose” - factors like time, duration, intensity
  - Pedagogical approach
- Establish **intervention efficacy** – a process measure (assessment) that convinces the reader that the intervention was delivered as intended

# Quantitative Methods

## ➤ Procedures - Considerations

- Ethics - Human subjects consent
- Chronological time line of what happened in study
- **Inter-rater** reliability of assessing DV (rating between 2 different raters – also called inter-observer agreement)
- **Intra-rater** of assessing DV (rating within 1 assessor over the timeline of the study – inter-rater drift)

# Quantitative Methods

## ➤ Statistical analysis

- Select the statistical approaches that allow you to answer your RQs – look to the literature for how other people have done this.
- Consider the type of data you have (ratio, ordinal, nominal)
- Power analysis – is your  $N$  big enough to run the analysis
- Statistical assumptions – check your data meets the statistical assumptions
- **Hierarchical Linear Modeling** – evaluates intervention effects taking into account teacher/class effects
- **2 Group** (SKIP, Comparison) **X 2 Time** (pretest, posstest) **X 2 Gender** (girls, boy) **ANOVA with repeated measures**: look for Group X Time & Group X Time X Gender interaction

# Qualitative Research

- Qualitative researchers aim to gather an **in-depth understanding of human behavior and the reasons that govern such behavior.**
- Often smaller, but focused, samples are selected rather than large samples.
- Qualitative methods rarely claim to **generalize findings** to other populations. It produces **IN DEPTH** information on the particular cases studied. After reading the research the reader is left to determine the ways in which the findings generalize to his/her research.



# Qualitative Research - Inductive

- Cases (participants) selected **purposefully**, according to whether or not they typify certain characteristics/contextual locations.
- **Researcher lens** - researchers reflect on their role in the research process & make this clear in the analysis.
- **Interpretive** - Make meaning of the data collected
- **Holistic & contextual analysis of data** rather than being reductionistic and isolationist. Nevertheless, systematic & transparent approaches to analysis are almost always regarded as essential for rigor.
- **Inductive analysis** – data drives modification of the Research Questions, the assertions developed, & conclusions made.

# Qualitative Theory for My Hot Topic

## ➤ Social Constructivism

- **Constructivism** is a theory of knowledge (epistemology) that argues humans generate knowledge and meaning from an interaction between their experiences and their ideas.
- Each learner is unique, complex, & multidimensional with unique needs and backgrounds. This view of the learner promoted & supported in learning environment.
- Encourages the learner to arrive at his or her version of the truth, influenced by his or her background, culture or embedded worldview.



# Qualitative Research Questions

- How do children make individual meaning as they participate in the SKIP motor skill program and how do individual characteristics influence their understandings?
- What is children's understanding of their changing motor skill competence across the SKIP motor skill program?
- How does the SKIP program influence children's motivation to be physically active?
- Tie back to theory:
- Children are unique and their understandings will be different.
- Focused on how children “see” their own motor competence not actual motor competence.



# Qualitative Research Questions

- **What types of factors in disadvantaged communities exist that support or are a barrier to developing motor competence?**
- **How do family dynamics, culture, and modeling influence a child's development of motor competence and their motivation to be active?**
- Tie back to theory:
- Motor competence is influenced by a child's background, culture or embedded worldview

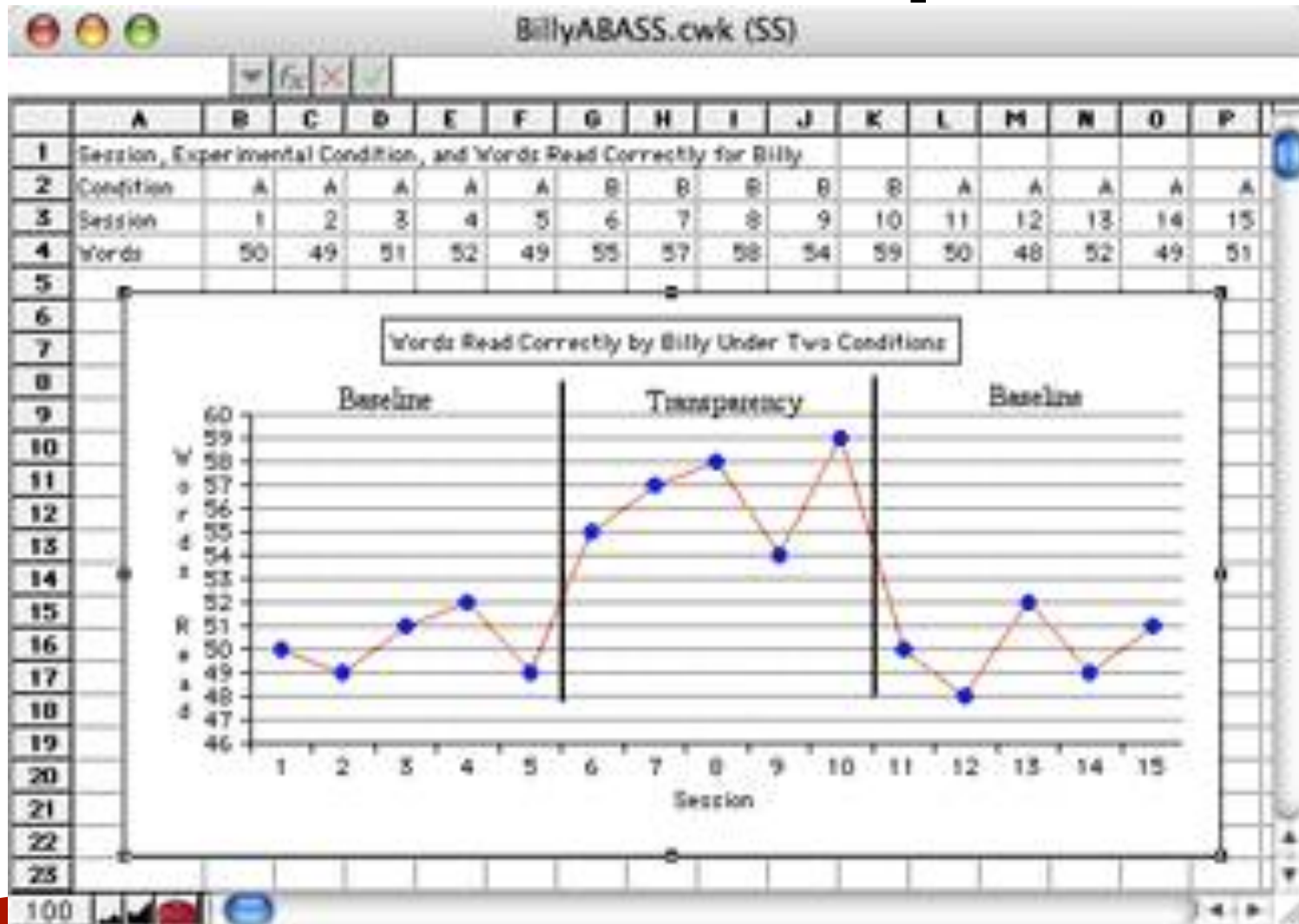
# Single Subject Research

- Group of research methods often used with behavioral theory & applied behavior analysis in the experimental analysis of behavior.
- Focus on the **conditions surrounding the change in a specific behavior.**
- Behavior analysis is data driven and typically inductive
- Focus on the observable relationship of behavior to the environment
- By functionally assessing the relationship between a **target behavior** and the **environment**, the methods of Applied Behavior Analysis can be used to change that behavior.
- Chart the behavior & visual examination of findings

# Single Subject Research

- Four principal designs in this type of research are:
  - **Changing criterion** – change level of reinforcer & see what happens to behavior – develop a functional relationship between level of reinforcer & behavior change.
  - **Reversal ("ABA")** – Baseline=A, Treatment=B (observe how behavior changes) return to Baseline=A (behavior should go back to baseline)
  - **Alternating treatments** – change treatment rapidly & see effect on behavior
  - **Multiple baseline** – Grp 1-Baseline then apply treatment & see how behavior changes. Grp 2-baseline is longer & then apply treatment. Grp 3-longer baseline etc. Controls for learning effects.

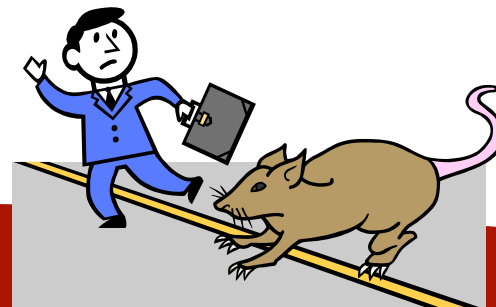
# Chart Example



# Theory for My Hot Topic

## ➤ BEHAVIORISM

- The research paradigm of single subject research and the theory of behaviorism are linked closely.
- Looks at the reinforcers (conditions) surrounding a behavior being produced.
- Reinforcement processes shape behavior.
- Behavior change results from application or removal of specific conditions of reinforcement.



# Single Subject Research Questions

- ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
- **Examine the effects of the SKIP instructional approach on low skilled male and female students opportunities to respond (OTR) in performance of the overhand throw for force.**
  - **Will OTR increase under the SKIP condition as compared to baseline?**
  - **Will there be gender differences in the way students respond to SKIP condition?**
- Tie back to theory:
- A (baseline=traditional approach) – B (SKIP approach) – A (baseline) – how do OTRs change
- Conditions influence behavior - the application and then removal of the SKIP condition shows relationship between SKIP and OTR

# What Have We Learned?

- A hot topic can be looked at from many different perspectives
- There is often a relationship between research paradigm and the theory selected
- There should be **STRONG** relationship between **THEORY** and **RESEARCH QUESTIONS** – these two aspects should align
- The design of the study will come from the way the RQs are framed and the theoretical perspective

# TASK

- Read your article and identify:
  - Theory
  - Purpose statement
  - Research Questions
  - Headings and subheadings from the methods
- Report back to the large group
- Were things well laid out in the article?
- What have you learned from this exercise?