

Research Designs PPT

1. Ex Post Facto

- a. After the fact research, examines the data already on file
- b. Case control (see example ii)
- c. Retrospective search for causes
- d. Case Study Research
- e. Problems with Reliability
 - i. Data may have been collected by someone else & IV have occurred in the past
 - ii. Causes of human disease in most cases are not experimental
- f. Strengths
 - i. Sometimes the only type of research that can be done
- g. Weaknesses
 - i. Not experimental
 - ii. Extraneous IV are not ruled out
 - iii. Cannot assert cause and effect relationship
 - iv. May be statistical correlation which may be significant, but only if the two variables coexist
- h. Examples of Retrospective:
 - i. “Children with autism (43), dd(30), and TD(36) were recruited from 2-7 years old. Parents provided home videos of children in infancy. Staff compiled video samples in age intervals and coded samples for frequency of social interaction, behavior reg, and joint attention.”
 - ii. “There’s a suspicion that zinc oxide (nonabsorbent sunscreen) can lead to skin cancer compared to absorbent sunscreen. A case control study was conducted to investigate if zinc oxide is more effective skin protection measure. The study compared former lifeguards that developed skin cancer and lifeguards without this type of cancer and assess their type of sunscreen used.”
 - iii. EX: Retrospective analysis of data collected from clinical files in 1978 of 100 children seen for fluency evals- looking to see if those who were referred for tx differed from the other children on a number of variables
 - iv. EX: Relationship between smoking and lung cancer “compare speech and lang comp between low birthweight and normal birthweight in 9 year olds”

2. Normative Research

- a. The distribution of selected DV across age groups are observed and recorded
- b. Also called developmental research- measures changes in behavior/characteristics of people over time
- c. Purpose: to get norms (for morphology, syntax, phonology, semantics)
- d. Usually focuses on very young or very old
- e. Seeks to establish behavioral differences
- f. Procedure: randomly selects subjects that are representative of the population, sample the behaviors, statistical analysis of behaviors, obtain means and SD

- g. Strengths
 - 1. Establish norms

- h. Weaknesses

- i. Representative of sample
 - ii. Need a small sample- only like 2 or 3 chances to produce gram. Morph.
 - iii. Can only describe observed events and cant explain them
 - iv. Not experimental

- i. Examples

- i. “cross sectional growth study investigating changing patterns of intelligence by sampling groups of children at 10 different age levels”
 - ii. “physiological development of speech motor control in young children”
 - iii. “changes in hearing as adults progress through age”
 - iv. “development of abstract entities in language of adolescents”
 - v. “The purpose of this report is to provide such reference and to provide a basis for clinical needs of differential diagnosis of stuttering from normal disfluency. Data are presented from 90 stuttering children ages 2 to 5 within 6 months of stuttering onset and from 54 age-matched normally fluent children. Means for disfluency types are presented. No significant differences were found for gender or for age”
 - vi. “The purpose of this study was to compare Percentage of Consonants Correct-Revised of typical 24-and30-month olds to a performance curve

3. Developmental Research (under Normative Research)

- a. Cross Sectional

- i. Selecting subjects from various age groups
 - ii. Example
 - 1. “examine the influence of aging in 4 age ranges: 20-39, 40-59...
 - iii. Weakness
 - 1. Observations are made of differences between participants of different ages in order to generalize about developmental changes that would occur within participants as they mature

- b. Longitudinal

- i. Same group is followed over time
 - ii. Example
 - 1. “10 children with developmental phonologic disorders for 7yrs”
 - iii. Weakness
 - 1. Expensive, time consuming

4. Standard Group Comparison

- a. Also called comparative research/static group comparison

- b. Measures behavior of 2+ participants at one point to draw conclusions about the similarities and differences between them
- c. Either *compares* 1DV to the same DV, or 1 DV to other DVs
- d. No manipulation of a IV
- e. Examples
 - i. “studied vocalization patterns, phonetic profiles, syllable formation patterns of 30 toddlers with SLI-E and 30 typically developing toddlers’
 - ii. “children who have language problems compared with normal language children on the age at which they master grammatical morphemes”
 - iii. “Assess difference between stuttering and nonstuttering persons on motor performance”
 - iv. “persons with and without aphasia are compared on basis of memory skills”
 - v. “This study compared the longitudinal performance of two groups of toddlers with palatal clefts and an age-matched group of children without palatal clefts on measures of elicited symbolic play at 18, 24, and 30 months. The results indicated that the group with isolated cleft palate differed significantly from both the cleft lip and palate group and the noncleft group on all but 1 play measure. Correlational analyses for each group indicated significant positive correlations between a number of the play variables at 18 months and productive vocabulary and MLU at 24 and 30 months of age. The findings suggest that assessment of early play gestures may assist clinicians in identifying children with clefts who are at risk for later language impairment.”
- f. Strengths
 - i. Useful info on differences between normal and clinical populations
- g. Weaknesses
 - i. Other variables may be operating
 - ii. Difficult to draw conclusions about the causation

5. Correlational Research

- a. Study *relationships* among 2+ variables by examining the degree to which changes in one variable correspond with or can be predicted from variations in another
- b. Two questions:
 - i. How closely related are the variables?
 - 1. Correlation coefficient determines the strength of the relationship
 - 2. Good for complex variables
 - 3. Depicted by scatterplot

4. Determines the degree of the relationships
5. Positive correlation- increases in 1 variable, the other variable increases
6. Negative correlation- increases in 1 variable, decreases in the other variable
7. Zero correlation- two variables are unrelated
- ii. How well performance on one variable can be predicted from knowledge of performance on the other variable?
 1. Done by regression analysis
- c. Examples
 - i. “speaking rate in dysarthria associated with ALS”
 - ii. “relationship between intelligence and self-esteem”
 - iii. “relationship between anxiety and achievement on the exam”
 - iv. “how well a college applicant will do based on HS record”
 - v. “relationship between deaf childrens speech and speech intellig.”
 - vi. “relationship between GPA and another variable”

- vii. “Factors that have been used to predict future reading competence vary widely from study to study. This study examined the *relationship* between cognitive skills (expressive and receptive language, phonological awareness, Performance IQ, vocabulary, and verbal memory) and reading (decoding and comprehension) at three different stages of reading development: Early Elementary, Middle School, and High School.”
- viii. “Language samples were examined from 10 children with developmental language disorders *relationship* between the size of a language sample and the calculated mean length of utterance. This research investigated the similarity of MLU calculated on language samples of different sizes.”

- d. Weakness
 - i. A does not cause B

6. Case Study

- a. Investigates an individual, group, or community
- b. Non experimental
- c. Aids in clinical techniques
- d. Weakness
 - i. Limited to generalizability
 - ii. Vulnerable to subject bias
- e. Examples
 - i. “development of personal pronouns from reversal to correct usage in a

- ii. highly imitative child with otherwise normally developing language
- iii. “Use of tactile supplements to lipreading in adult deaf and who spoke English and Swedish
- iv. “Speech deterioration in amyotrophic lateral sclerosis
- v. “A review of Japanese phonology is provided to offer a context for understanding the transfer of Japanese to English productions. A case study of an 11-year-old is presented, demonstrating parallel speech assessments in English and Japanese. Speech motor and phonological awareness tasks were conducted in both languages.
- vi. “The charts of 9 patients with AIED who had been seen in the Saint Louis University School of Medicine's clinic between 2004 and 2011 were reviewed, with special focus on audiometric results.”

7. Field Study

- a. In-depth study of individual or groups of people in a natural setting
- b. Background studying
- c. Examples:
 - i. Piagets study of cognitive growth in children
 - ii. Intensive study of inner city culture
 - iii. “The research was conducted using an array of ethnographic methods. The findings were summarized in a set of claims concerning the engagement and learning of these students. Finally, cases of individual students were constructed to illustrate these claims. The article concludes with the case of one fourth-grade student as he engaged in a program of study investigating why objects float and sink. The case revealed (a) the ways in which, in the context of guided inquiry, the student achieved a number of

positive outcomes; (b) how his learning problems, principally with regard to print literacy, revealed themselves in his activity; and (c) how contextual features served to enhance and deter his engagement and learning, as well as the engagement and learning of others.

8. Evaluation Research

- a. Assesses effects of social and educational programs and enhances accountability
- b. Not experimental
- c. Three types:
 - i. Process evaluation-was the program implemented in the way it was described and whether the program served the population
 - 1. Examine procedures used in implementation of the program and ask what modifications were made
 - ii. Impact evaluation-effects of the program on the target population
 - 1. (also called outcome evaluation) – did the target population benefit

- as prescribed by the program
 - 2. Used to determine if a program should be discontinued, replaced, modified, continued or replicate
 - iii. Comprehensive evaluation-assessment of process and effects of the program
- d. Strengths
 - i. Helps make policies
 - ii. Assess usefulness of the program
- e. Weaknesses
 - i. Cant determine effectiveness of a program
- f. Example
 - i. “This article presents, and explains the issues behind, the Stuttering Treatment Research Evaluation and Assessment Tool (STREAT), an instrument created to assist clinicians, researchers, students, and other readers in the process of critically appraising reports of stuttering treatment research.

9. Survey Research

- a. Assesses some characteristics of a group
- b. Detailed inspection of the prevalence of conditions, practices or attitudes in a given environment by asking people
- c. Questionnaires- collecting information from a wide range of persons
- d. Interviews: gathering detailed information from a more restricted sample
- e. Response rate of 50% is adequate, response rate of 60% is good and 70% is very good
- f. Strengths
 - i. Helps determine dispositions of large groups of people
- g. Weaknesses
 - i. May be a biased representation
 - ii. Cannot isolate events or explain

10. Experimental Research

- a. Cause and effect
- b. Series of controlled conditions in which one or more independent variables are manipulated and the effects of such manipulations on the dependent variable are measured
- c. Most powerful
- d. Three characteristics
 - i. Manipulation-experimenter does something to at least some of the subjects

- ii. (must be under controlled conditions so we know it's the IV)
 - iii. Control-use of a control group
 - iii. Randomization-assign subjects to an experimental or control on a random basis
 - e. Strengths:
 - i. Can isolate cause-effect relationship
 - ii. Can explain events and support theories
 - f. Weaknesses
 - i. Cannot be extended to all kinds of problems
 - ii. Criticized as artificial
 - g. Examples
 - i. "The effect of positive reinforcement on attitude toward school"
 Dependent variable: attitude toward school
 Independent variable: type of reinforcement
 - ii. "This exploratory study investigated the outcome of in-service training on language facilitation strategies of child care providers in day care center. Sixteen caregivers were randomly assigned to experimental and control groups. Caregivers were taught to be responsive to children's initiations, engage children in interactions, model simplified language, and encourage peer interactions. At posttest, the experimental group waited for children to initiate, engaged them in turn-taking, used face to face interaction, and included uninvolved children more frequently than the control group. In turn, children in the experimental group talked more, produced more combinations, and talked to peers more often than the control group. The results support the viability of this training model in early childhood education settings and suggest directions for future research.
 - iii. Two approaches to grammar facilitation in preschool-age children with language impairment were evaluated. One approach was administered by a speech-language pathologist and the other was presented by the subjects' parents, who were trained by the speech-language pathologist. Both treatment packages ran for 4 1/2 months and made use of focused stimulation procedures and a cyclical goal-attack strategy. Subjects were 30 children between the ages of 3:8 and 5:10 (years:months) who had marked delays in grammatical development. Children who served in a delayed-treatment control group averaged no gains over their no-treatment period

11. Quasi-Experiment Research

- a. Manipulation of a variable but without a comparison group or randomization
- b. Do not have the same degree of experimental control
- c. May involve settings where it is not possible to control all the variables

d. Compromises all internal validity

e. Examples

- i. “A quasi-experimental design was employed to measure the PA, reading and spelling development of one hundred twenty-nine 5-year-olds. Thirty-four children received 10 weeks of PA instruction from their teachers. Ninety-five children continued with their usual reading program, which included phonics instruction but did not target PA.

12. Treatment Efficacy

- a. Carefully controlled group studies which investigate the relative efficacy of two or more intervention paradigms

13. MetaAnalysis

a. Method for integrating and synthesizing research studies

b. Uses previously gathered data

c. Statistical techniques are used to compare results

d. Examples

- i. A substantial contemporary research literature on the impact of otitis media with effusion (OME) on language development in young children currently exists. Compared to the reports of earlier retrospective research on the topic, the results of the more recent prospective studies may be viewed as less conclusive and more equivocal. Nonetheless, the negative impact of OME on young children's language development appears to be a widely held belief. What is required now, in addition to the continuing primary research, and occasional qualitative/narrative reviews, is an objective quantitative analysis, synthesis, and evaluation of this research literature. The purpose of this project was to conduct such an examination employing the methodology of meta-analysis. The results of this meta-analysis of the contemporary primary research on OME and language development in young children show that the magnitude of the statistical population effect of OME is markedly low.
- ii. A systematic review of the literature on PECS written between 1994 and June 2009 was conducted. Quality of scientific rigor was assessed and used as an inclusion criterion in computation of effect sizes. Effect sizes were aggregated separately for single-subject and group studies for communication and speech outcomes
- iii. A systematic literature search yielded 18 studies that met the predetermined inclusion and exclusion criteria. Effect sizes for each study were calculated for 7 language outcome variables and analyzed using a random effects model. Separate analyses were conducted for each language outcome and for each comparison group. Outcomes were compared for children with and without intellectual disabilities and for parent report and direct observational language measures.

14. Qualitative Research

a. Examples:

- i. In-depth interviews were conducted with 55 mothers of young children with FXS. Interviewers asked mothers to describe their children's communication, strategies they used to help promote their children's

communication, communication-related frustrations, their expectations for their children, and the roles that they perceive for themselves.

- ii. We conducted 4 focus groups and one 1-on-1 interview with a total of 20 adults (7 Deaf, 15 hearing) who work at bilingual–bicultural (ASL–English) schools for the Deaf. Experiences of these educators and language professionals were analyzed qualitatively using a combination of grounded theory
- iii. Qualitative investigation examined semistructured interviews of 31 survivors of ABI. Thematic analysis followed a phenomenological approach and revealed 4 major themes and 28 subthemes in the interview data. Four participants stood out as exemplars of the themes embodied by all participants in this investigation. Quotes from each are used to highlight the prevailing themes.

Quiz→ What type of research?

1. This study followed the development of pragmatic accomplishments and vocabulary development in five children with autism from the prelinguistic to early oneword stage of language.
 - a. Longitudinal case study
2. Preparation of Speech-Language Pathologists to Provide Services to Patients With a Tracheostomy Tube Speech-language pathologists often are consulted to facilitate communication and swallowing for patients with a tracheostomy tube. The purpose of this study was to survey the clinical knowledge base of speech-language pathologists serving patients with tracheotomy and the level of confidence they place in their ability to provide professional treatment to these persons
 - a. Experimental or quasiexperimental
3. Twenty-four adults participated in a 2 (group) by 3 (rate) factorial study designed to determine the main and interactive effects of speech rate during reading on the frequency of stuttering. In this regard, the participants orally read three passages, one at their normal rate, one that was 30% faster than this rate, and one that was 30% slower
 - a. Experimental or quasiexperimental
4. The present study was designed to examine how preadolescents gain an understanding of idioms. In particular, it examined the role of idiom familiarity in conjunction with students' language-based academic abilities. The participants were 50 children (mean age 12 years 4 months) who attended a primary school in Christchurch, New Zealand.
 - a. Developmental or normative

Summary of Research Types and Their Strengths and Weaknesses

Type of Research	Strengths	Weaknesses
Ex post facto: Retrospective study of events; case studies	Can describe an effect and suggest potential causes in the past Sometimes the only possible research type	Cannot isolate causes or explain effects Not experimental
Normative research: Studies the distribution of behaviors across age groups	Can describe behaviors specific to age groups Helps establish norms	Cannot specify causes Not experimental Cannot explain behaviors
Standard-group comparison: Study of clinical versus non-clinical groups	Can describe differences Helps distinguish clinical groups	Cannot specify causes Not experimental Cannot explain effects
Experimental research: Assessment of cause-effect relations	Can isolate cause-effect relations Can explain events and support theories	Cannot be extended to all kinds of problems Criticized as mechanistic and artificial
Clinical and applied research: Designed to solve practical problems	The experimental type can isolate causes, explain events, assess treatment effects	The descriptive type cannot isolate causes, explain events, or assess treatment effects
Sample survey: Study of opinions and attitudes through random samples	Helps determine dispositions of large groups of people	Cannot isolate causes Cannot explain events Not experimental

