Notes for a Class in
Educational Research and Statistics

Taught at Biola University
By Donald Ratcliff

Overview of Text

- Part I—Introduction (ch. 1 & 2)
- Part II—The Steps of Research (ch. 3-10)
- Part III—Designs/Approaches (ch. 11-16)
  We will not cover ch. 17, and only part of ch. 18 early in class. I will add another design the last regular night of class; one that fits with many of the other designs and may be basic to *all* of them in some ways.
- Appendix B—how to defend a research proposal (may come in handy some day) (The other appendix is less useful)
- Really good glossary—p. 641.

One of best textbooks I have found, very balanced, a bit cookbook-ish --not everyone uses the steps Creswell lists, but it can help beginners to have everything spelled out in detail; you need to learn the song before you can improvise effectively.

Two schematics for two halves of book and class:

I. Overview of research process: The Six Steps
- What is the progression for doing research?
- Six steps introduced in ch. 1, reviewed briefly in ch. 2, then described in detail in ch. 3-10

II. Varieties of research you can do: The Eight Designs
- Not all of the possible designs, but most of the common ones used today
- Introduced in ch. 2

- Mentioned in several of the early chapters (especially 6-9)
- Detailed in ch. 11-16

A Biblical Perspective for Research

(Adapted from the work of Ted Ward and J. P. Moreland by Don Ratcliff)

The excitement of conducting research

Knowing before others

You as a source of knowledge.

"To boldly go where no one has gone before"

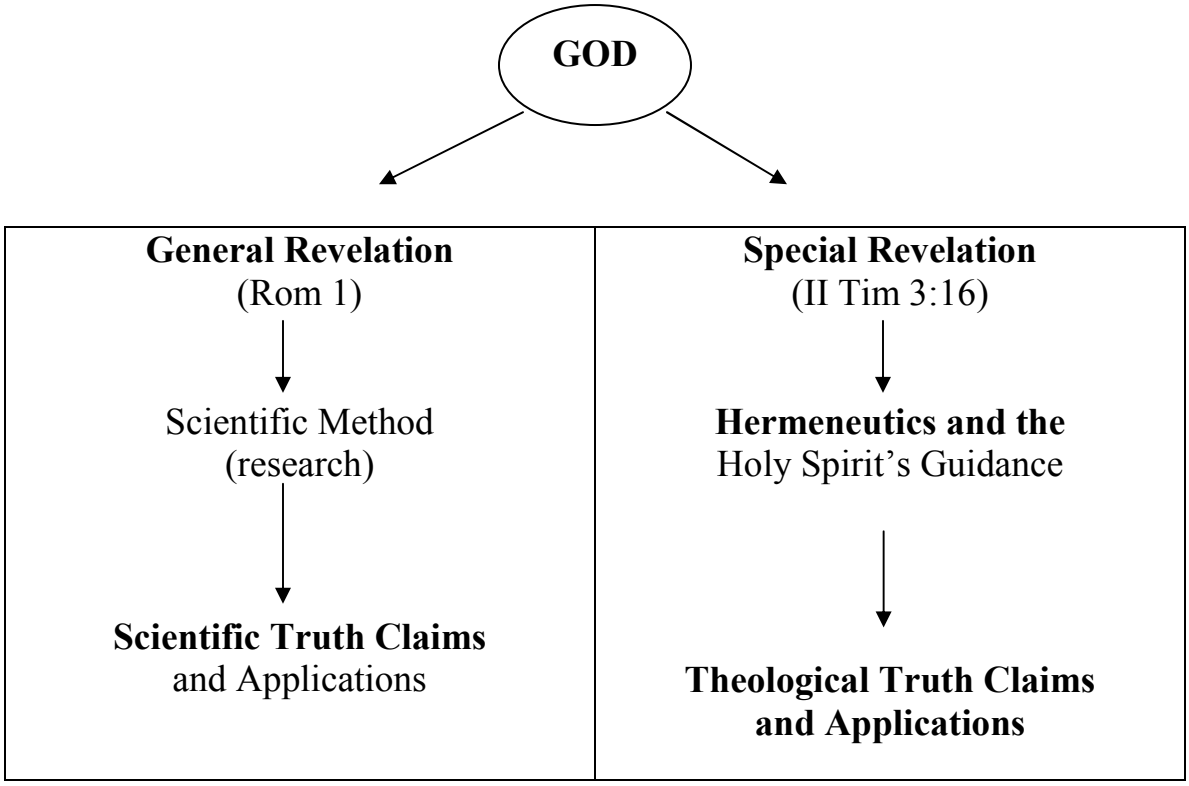
Genesis 1:26

Book of Proverbs parallels research principles (dozens)

Prov. 8:34, 2:4&5

I Thes. 5:21

Foundation is God—Prov. 1:7 He is the source of all truth:



Truth claims of the two sources and methods may be:

- Independent
- Similar
- Complementary
- Contradictory
- Some combination of the above/blends

Anyone who makes truth claims has values that influence their work, whether they be theologian, educator, and/or researcher.

While both Bible and research make truth claims, the Bible also provides:

- Values and moral absolutes
- Meaning and purpose for life
- Insight into a relationship with God—through Christ

Scientists also have values, and science rests upon assumptions:

- Not always chosen values and assumptions (Schaeffer)

- There is a real world "out there"
- The world can be studied systematically
- Knowledge, however limited, is possible
- Systematic study and careful reflection will produce superior understandings to normal, everyday experience

These assumptions also are shared by Bible scholars (presuppositions)

Why contradictions between research and the Bible?

- Inadequate research methodology
- Inadequate methods of studying Bible
- Limited access to information (either)
- Poor methods of analysis (either)

Conclusion: Good research and good Bible interpretation will ***never*** conflict because both reflect God's revelation.

How can teachers use a research methods class? (and why is this class required)

by Don Ratcliff

A. This class can help you understand and critique existing research (see the flaws—there are always weaknesses to any research).

- Research studies cited in textbooks
- Research reports to read in other classes (or even a thesis)
- Good teachers keep up on research related to their teaching
- Be a critical consumer—learn the language of research
    - Not caught up in fads
    - Be able to spot poor quality research (so won't be misled)

B. Preparation for a thesis research project. Three options: comprehensives, project, or thesis. Why be one of the select few?

- Learn habits of good observation and interviewing
- Learn something you may be puzzled about
- Give something back to the teaching profession (not just a taker)
- A witness to the world via ERIC

C. Preparation for more education (beyond the Masters) that will require research.

- Individual class projects
- Expectation that you understand research methods
- Dissertation work

D. Increase your effectiveness as a teacher

- Evaluating students is much like research
- Improvement as a teacher is much like research
- Unique insights into your classroom and school—***Action Research***

Ways of Knowing

Adapted from William Ray, *Methods Toward a Science of Behavior and Experience,* 4th ed. (1993) by Don Ratcliff.

There are at least five ways of knowing in human experience:

1. **Tenacity**—holding on to a perspective without any consideration of alternatives

2. **Authority**—affirming an authority to whom you refer for truth (the Bible, God, a pastor, a textbook, parents, teachers, etc.)

3. **Reason**—rational thinking and logic are the basis of knowledge; philosophy and reasoning from assumptions to conclusions.

4. **Common sense**—accepted wisdom or what just appears to be the case from casual observation

5. **The scientific method**—basis for the natural sciences, adapted to human behavior for the social sciences (psychology, sociology, education, anthropology, etc.)

Appendage: In a sense, Christians affirm all five sources of knowledge. We affirm the authority of God and the Bible, due to the inerrancy of Scripture. We affirm theology and other forms of reason that rest upon an accurate view of God and the Bible as the ultimate authorities. Common sense is useful—there is a lot of it in the book of Proverbs—but it should be tested when possible by science, reason, and the Scripture. The scientific method is valuable not only for testing common sense but for also helping us avoid questionable reasoning, including faulty theological reasoning. Can Christians be tenacious? I believe that once we have thought through our faith ("counting the cost") and affirmed God and Scripture as our ultimate authority, we can be tenacious about that affirmation ("rooted and grounded" "building upon the rock, not the sand" "not driven by every wind of doctrine"), but always open to understanding others within their frameworks of understanding, willing to share with others at their level, and willing to admit things we do not understand. Our tenacity is limited to things that are firmly established in Scripture, not just personal opinions and common sense. Because we are tenacious about our basic assumptions, but very open to exploring God's creation through the scientific method, including humanity and the education of human beings.

Isaac Newton's Rules of Reasoning (characteristics of good theories)

The rules of reasoning are adapted by Don Ratcliff from William Ray, *Methods Toward a Science of Behavior and Experience,* 4th ed. (1993)

1. **Parsimony**—the simplest complete explanation is the best. As much as possible, avoid jargon and unnecessary complexity.

2. **Unity and order**—Newton assumed there is an order to nature and the universe, including people's actions. This fits with creation and the existence of our Creator.

3. **Generalizability**—People, animals, and things in the world have similarities, and thus laws and principles hold true for similar things, and by extension characteristics of people can also be true for other people. To some extent animals are similar in some ways to people because of what Francis Schaeffer termed the "continuity of creation."

4. **Data is to be trusted over opinions**. This is true in the faith dimension as well; we should trust the Bible, not just someone's opinion about the Bible (even if it is a theologian—if it is just opinion, then it is secondary to the Bible in authority).

Appendage: Science is not sacred, though—not to be worshipped, but respected and trusted if done well (as in theology). Science does not give final answers and cannot answer all questions. It is a very human endeavor—not a completely objective approach, but a way of systematically using experience to test ideas. Indeed, research methods can be understood to be an extension of the trial and error babies and children use, as do adults in everyday life. We are all born "little scientists" (as Piaget termed it).

The Limitations of Scientific Research
(and thus the need for humility in conducting research)

These are primarily my own reflections, but I know I have used many sources that have helped me in sorting out these ideas, including Ray's research text and others.

1. **Our tools**—the methods and instruments used are limited. We may be overly impressed with a method, instrument, or other aspect of doing research (or teaching!) and try to reduce our experience to what can be studied (or taught) with that method or device. Scientism is a real threat—reducing our incredibly complex world to that which can be measured or observed.

We must be careful not to ***reify*** our constructs; act as if our concepts are exactly the same as the real world. Concepts and theories are ways of understanding and interpreting reality, but the real world is ultimately much more complex. Theories and concepts are like maps—useful for getting to a destination—but a map only represents certain aspects of the world, such as roads, cities, rivers, etc.

For example, it may be tempting to treat depression as a thing, but actually it is a ***construct*** used to understand and treat people. It is a construction we impose on people that represents a cluster of actions and ways of thinking. It is a useful construct, but it is only a construct and therefore it is limited.

As Christians, one can find truth through research and careful study, but we live in a complex world that also includes God, Satan, angels, and the like. Avoid making God "too small" and that is a danger in relation to the universe as well. The sin of pride can make us overconfident about our constructions. We need humility about our procedures and the results of using those procedures. Always see the person—your student or the person you are studying—before trying on constructs and using procedures. I Cor. 13:99, 12.

2. **Our world view**—our preconceptions limit us. Sometimes we cannot see reality because assumptions get in the way (known or unknown bias). We need to cultivate a sense of openness to different possibilities, again an expression of humility that we can be wrong. This was one of the key differences between the Pharisees and Jesus—the Pharisees had preconceptions that clouded their experience, and thus people tended to be reduced to categories (the woman caught in adultery, the woman at the well, gathering food to eat on the Sabbath). Jesus tried to open them up to real people and push them beyond their limited categories.

Of course, a person can be a bigoted humanist; be so open that one ignores aspects of life that are real but do not fit the secular humanist mindset (such as the supernatural world, or the unchanging absolutes related to morality). Christians should be more open to the world as it is because God made it; "closed minded" Christians seems like an oxymoron; we should be the most open in regards to God's creation as we know the Creator. The Pharisees were very closed and they were the main enemies of Christ.

There is movement to a less stable view of the world—from determinist perspective to a less determinist or even chaotic view of the world. While I believe there are genuine choices in the world, because the Bible affirms it ("choose you this day whom you will serve"), this is quite different from the postmodernist perspective that makes us question cause and effect relationships or genuine knowing of the world. We need balance between cause and effect influences and the reality of choice, and not buy into either the narrow modernism that is overly deterministic or postmodernism that ignores cause and effect influences and the relatively stable world we live in. A distinctly Christian perspective puts these antithetical views into proper balance—the world was created by God and thus we expect to find order, but sin has entered the world and thus there is disorder and chaos, and thus we are faced with genuine choices because God does not force us to follow a predetermined plan. I call this "neomodernism"—the world is real, we can know it, but we are limited in our knowing and can make mistakes rather easily. Knowing the Creator helps us find truth not only in scripture but in the world around us and in the study of people. We start with the right foundation when we start with biblical Christianity.

3. **Psychological limitations**. We fear failing and looking stupid (or perhaps we fear making God look stupid). We need to be bold—we are discovering God's creation, so the threat is not to our world view, but only to our limited understandings and biases within that world view. We need to move from the limited human perspective to the divine perspective. Knowing God and knowing his revealed Word are essential steps in this process.

As we look at the world from an informed Christian perspective, we sift what we see according to the absolutes God has revealed. Thus theories can be created, because we are created in God's image, but they are tentative statements that can be modified as we gain more data. A parallel in theology can be drawn here—theology is a partial and tentative summarizing of the Bible and God, yet the Bible and God are always greater than our limited theological understanding—to say otherwise is to make our theology an idol that can obscure God's greatness that extends beyond our limited understandings of him. We must never put God in a box, saying He has "five characteristics" (not four or six); God is always much larger than any construction of Him. Our goal is to use psychology, or education, or whatever we study, to be a means of apprehending God's view.

Research is a very helpful collection of tools, but it should never become an idol. "What we observe is not nature herself, but nature exposed to our method of questioning" (Warner Heisenburg, 1901-1976).

Action Research

Adapted from chapter 18 of Creswell's *Educational Research* (Upper Saddle River, NJ: Merrill Prentice Hall, 2002) by Ron Shope and Don Ratcliff, and adapted from Geoffrey Mills' *Action Research, 2nd ed.* (Upper Saddle River, NJ: Merrill Prentice Hall, 2003) by Don Ratcliff.

I. Definition of Action Research (Creswell, p. 603, taken from Mills):

> "Action research is systematic inquiry done by teachers (or other individuals in an educational setting) to gather information about the ways their particular educational setting operate, how they teach, and how well their students learn."

"Action research is an invitation to learn, a means to tackle tough questions that face us individually and collectively as teachers, and a method for questioning our daily taken-for-granted assumptions as a way to find hope for the future." (Mills, p. v).

II. Characteristics:

- Addresses the gap between the daily practice of teachers and academic research; practical issues are studied that have immediate benefits.

- Research activities are embedded in the daily activities of teachers; people participating at the site test ideas, gain insight, and experiment with new practices--you can teach and research at the same time.

- The research locations are the classroom and school.

- Teachers and administrators take the role of ***learner*** rather than ***experts***; a democratic approach in education is encouraged.

- Emphasizes action, progress, and reform; ideas are tested and everyday assumptions are challenged.

- The process is dynamic; there are repeated "spirals" or iterates, as results influence what is to be done next in the study.

- Research is often collaborative; research takes place as you work with others in the school who review findings, help with data collection, and do other activities (you are not studying "them").

- Research seeks to answer questions of meaning and may also include questions related to numbers.

III. The goals of action research are
  - to improve students' lives and learning,
  - produce a more effective practice of teaching, and
  - gain insight into teaching.

"Action research provides teachers with a philosophy and practice that allows them to systematically study the effects of their teaching on student learning." (Mills, p. 4)

Two Approaches to Action Research:

1. Practical Action Research—emphasizes individual or team activities to study learning by students and/or development of teacher. Leads to "teacher-as-researcher.

2. Participatory Action Research—emphasizes social issues, emancipation of the teacher and those researched, equality of everyone involved.

My focus—the first because the second has Marxist overtones (but some valuable insights).

1. Local school ***issues*** emphasized

2. Work alone or with other school people: other teachers, administrators, counselors, staff, and—most likely—students.

3. Test own explanations or theories, explore the influence of practices on school officials, teachers, students, and staff.

4. Systematic reflection on practice, thus potential for professional development.

Steps in action research:

1. Select an area for your focus of attention

2. Write a plan to guide research
3. Gather data in multiple ways: interviews, surveys, observations, artifacts

4. Analyze data by finding themes, conduct an organizational review, do concept mapping (diagramming the relationship between ideas), examine antecedents and consequences, display results creatively.

Example of Concept Map--Overhead

Overhead of quantitative and qualitative displays

5. [return to step 1, 2, or 3 and continue the spiral]

[Action Research Spiral—page 607 of text]

Examples: (adapted from Creswell text and Mills)

Group activity—which sounds the most interesting, or suggest creative new ideas that could be researched.

- Study an elementary-aged youngster in your classroom that disrupts constantly
- Team of teachers, students, and parents examine the effect of a new junior high math program
- Use technology and see what difference it makes (if any). Do students really gain anything, or do they just play with the computer?
- Work with students in high school to understand their views of portfolio development using a new program for writing
- Examine if not having in-classroom help for gifted students was a problem
- Track how use of drama affects teaching a communication class in high school (actual study reported on pp. 625-632)
- What can motivate students that are unmotivated?

- How does learning the keyboard of a computer help in doing word processing, spreadsheets, databases, and drawing on a computer?

- What difference does elimination of grades make on students' attitudes, teachers' assignments and choices of curriculum, and other aspects of class? How do grades compare with self-assessment by students?

- What are the results of a new policy on school attendance—are they the intended results and are there other problematic and/or beneficial results?

- What are the results of a new or modified curriculum on students' reading and writing skills?

- What folklore informs teaching? How do teachers learn and participate in a "culture of teaching?" How does that folklore conflict with (or complement) "teacher colleague culture," "home culture," "church culture," and other "cultures" of teachers?

- What folklore informs students and learning? How do students learn and participate in the "culture of learning?" How does this conflict with (or complement) "peer culture," "home culture," "church culture," and other "cultures" of students?

Note: These are just examples—don't just choose one of these, but look carefully at ***your own*** classroom and school for important issues specific to that situation.

"Action research . . . provides teachers with the opportunity to model for their students how knowledge is created." (Mills, p. 10)

How is action research a good model for students? (adapted from Mills, p. 10, including his quotation of Osterman and Kottkamp)

- Emphasizes that you should take responsibility for own development; everyone can learn and needs opportunities for growth

- Collaboration with others is a good idea
- Decisions are made that are informed by the real world; you learn from successful and non-successful experiences of self and others
- New information is linked to existing knowledge
- One learns to develop questions and discover answers in a systematic manner; problem solving is a practical and professional activity

So how can you develop an idea for an action research project?

Appendage: How to Get a Topic to Study

Adapted by Donald Ratcliff from Geoffrey Mills, *Action Research*, 2nd ed. (2003);
John and Lyn Lofland, *Analyzing Social Settings,* 3rd ed. (1994);
David Martin, *Doing Psychological Experiments* 3rd ed.(1991).

The spectrum of things that can be studied include the classroom, the school, children or adolescents, church, leaders in school or church, fellow educators, and environments. You need to take time making the decision, as you will spend a fair amount of time on the proposal and you don't want to get bored or come to see it as irrelevant. You need to be passionate about the issue.

Reflect on your classroom experience, talk with friends and coworkers, but don't make a rushed decision. You need to choose a topic that you are able to do in terms of having access and sufficient control. Start where you are and look around (environmental scanning). What could be studied that might improve your classroom experience (for students or self or society), or how the school functions. Gather some information about possibilities; reflect on your own views of key issues that keep "nagging" at you. Observe in public settings, observe friends, your kids, even your pets can give you ideas!

You might reflect upon:

- Theories you use in your classroom
- Values related to education that mean a lot to you
- How your activities in school impact the school as a whole, education in general, and society as a whole (possibly keep a journal for ideas)
- History of education in your society, region, state, district, school, or the history of something that occurs in your school

Reflect on your own background/s—what are your experiences in education—even when you were a child—that significantly influenced you positively or negatively, and what about those experiences could be studied as a topic? Reflect on your current situation—your own education—at present, your interests or things you must deal with. What interesting educational contexts do you have potential access to (your own kids' school, your parents' home, work, and/or school).

Review textbooks on a favorite topic, and scan the literature on the library web page to see if it is researchable. Pray that God will open you to the possibilities you may never have considered, then ask Him to narrow down the options and ask God to show you the best possibility. Spend time talking with God about the options and listen for God's response, either through the Bible or more directly from His "still, small voice."

Overhead: Eight phobias to avoid in thinking about a topic and planning research

Why is Research Important?

Adapted from chapter one of the Creswell text by Ron Shope and Don Ratcliff

I. Four Reasons Why Research is Important

A. Research Adds Knowledge About Educational Issues

- Addresses gaps in knowledge
- Expands knowledge—new areas emerge
- Adds voices of individuals to knowledge
- God conceals knowledge and we—like the king in Prov. 25:2—can search it out

B. Research Helps Improve Practice

- Teachers gain new ideas
- Teachers evaluate existing methods
- Teachers gain new insight into students
- Teachers can connect with other educators who are trying the similar methods

C. Research Creates Data for Policy Discussions

- Research helps people weigh different perspectives on issues
- Research helps people make informed decisions regarding policy

D. Research Helps Your Students (and you!) Build Skills

- Organizational skills
- Analytical skills
- Writing skills
- Presentation skills

II. Problems With Research Today

- Contradictory or vague findings
- Questionable data—postmodern influence

Appendage: There is a growing problem in some recent research—research is changing from the stable view of reality it once had, to more of a postmodern view (see earlier "Limitations of Research" section 2). The emphasis becomes telling a credible story, rather than finding objective truth. The strong research base is thereby being undermined. This non-Christian perspective is possible because the Christian/Reformation base of the early years of modern science (1600's and into the 1700's) is removed, and even the

underlying concept of stability of the world and possibility of getting at an approximation of truth has been lost.

Because of this poor foundation, research is passed off as acceptable that falls short of anything close to being accurate; poor research because of a poor foundations, but passed off as important because it confirms someone's biases. Political goals come to be considered more important than truth.

Examples: "Study links gene, homosexuality" and "Puberty arriving earlier"

Then why do research? "To convince people you are right." [I don't call that research.]

- Unclear statement about the intent of the study
- Lack of full disclosure of the data collection procedure
- Inarticulate rendering of the research problem

III. The Research Process

A. Research Defined:

"Research is a cyclical process of steps that typically begins with **(1)** *identifying the problem or issue of the study. It then consists of* **(2)** *reviewing the literature,* **(3)** *specifying a purpose for the study,* **(4)** *doing the research, and* **(5)** *forming an interpretation of the information. This process culminates in* **(6)** *a report disseminated to the audience that is evaluated and used in the educational community." (p. 18-19)* (Note: #4 was added to the definition)

B. Using Existing Research

1. What do you want to do?
2. What does the research say?
3. What lines of research help you?

C. The Six Step Research Cycle (figure 1.2 on page 9)

Overhead

1. Identify the Research Problem (chapter 3)
   - Specify a problem
   - Justify a problem
   - Suggest a need to study it for audiences
   - Usually is in the introduction of a research report

2. Reviewing the Literature (chapter 4)
    - Locate the Resources – see Beth Patton
        - Books (both literal and electronic)
        - Journals (many now full text at Biola)
        - Electronic Resources (internet—caution: as much or more junk than jewels)
    - Select Resources
        - Determine the relevant resources for the topic
    - Summarize the resources in a Literature Review
    - This usually is the second section of a research report, but may be infused throughout

3. Specify a Purpose for the Research
    - Identify the purpose statement
    - Narrow the purpose statement to research questions, hypothesis, or statement of Central Phenomenon to be studied
    - This is usually fused with the research problem in the introduction to a report

4. Collecting Data
    - Determine the data collection method
    - Select the individuals to study
    - Design data collection instruments and outline procedures
    - Obtain permissions
    - Gather information
    - This is in the method/procedure section of a research report

5. Analyzing and Interpreting Data
    - Breaking down the data (whole to parts)
    - Representing the data (parts to whole)
    - Explaining the data (interpretation)
    - Can occur during data collection or after data collection, depending upon the design
    - This is usually in the results/findings/ discussion section of a report

6. Reporting and Evaluating Research
   - Determine the audience for the report
     - Academic (thesis, dissertation, journals)
     - Teachers (papers, books, magazines)
     - Others: administrators, legislators, the public
   - Structure the report for the audience
   - Write the report sensitively and accurately

III. Ethical Considerations in Research

[see Code of Federal Regulations, Title 45, Part 46, Subpart D on research with children]

A. ***Informed consent***: "informed"--must know enough to be informed yet not so much the participant acts in an unusual manner, "consent" refers to ability to give permission (thus parents or guardians must give consent for youngsters under age 18).

- Respect the rights of the participants
- Children: permission from school, parents, ***and the child*** (if interviewed)
- Participants can leave the study at any time
- Honor the requests and restrictions of the research site (may be renegotiated)

B. Approval for research involves weighing outcomes against costs (such as discomfort, possible consequences to participants)

- Became an issue because of unethical research: Hitler ("experiments" in starvation), Tuskeegee (syphilis studies where some were infected but not given medication), and Milgram (supposed electric shock for incorrect responses)
- Misleading information—so people will not act in an unusual manner. Is deception for this reason ethical? Mary Stewart VanLeeuwen in *The Sorcerer's Apprentice* says it is never necessary to deceive; you can always find an alternative.
- Debriefing about the details of the research is crucial

Overhead

- Confidentiality (names not provided by researcher, but researcher could trace who did what) vs. anonymity (the latter is where one can not trace back responses to any specific participant)
- Any thesis research at Biola must be approved by a special university research committee—they are a "check" to be sure the outcomes really do outweigh the costs
- Assignments in research methods classes that involve participants have special protocol form (see syllabus)

C. Report the research fully and honestly

- Fabricated research—may be more common than we think (postmodern approach—"all research is just a personal story" implies that fraud is not a problem)

Overheads

- Misleading reports, "fudging" missing data, eliminating undesired data or participants, not admitting to potential confounding influences
- Acceptable—to bring order to something that was less than perfect, leaving out irrelevant details, as long as the report is truthful and not misleading [Do you agree? Is this compatible with Christian values or too much of a stretch?]
- Audit trail and data archives—keep original data 10 years

D. Plagiarism

- Not just on research reports but any paper for class
- Using exact words without quotation marks, even if there is a reference given
- Using another person's ideas, even in your own words, if you do not cite them (not just writing but in public speaking as well)
- Ignorance of the rules of plagiarism does not excuse you from liability
- Example: dean of law school affiliated with Trinity

Overhead

IV. Skills Needed for Research

- Curiosity
- Flexibility
- Enjoy solving problems, like a puzzle
- Good attention span (can develop it)
- Using the library and computer resources
- Writing and editing
- Willing to defer conclusions and be tentative

IMPORTANT CONCLUDING COMMENTS!!!

Be sure to read the two research articles between chapters one and two—they will help you understand chapter two and the rest of the book (they are also really interesting)

Quantitative and Qualitative Approaches

Adapted from Creswell chapter two by Ron Shope and Don Ratcliff

Prov. 1:1-7

Basic distinctions between quantitative and qualitative research (pp. 43-44; more complete summary on p. 58)

I. Combinations of Qualitative and Quantitative Research

The distinction is roughly an emphasis upon meanings and understandings by people vs. counting things.

[Combinations in figure 2.1 on page 45]

Overhead

II. The Historical Development of Quantitative Research

A. Overall trends

- At one time, spoke of "laws" of human behavior (Znaniecki, for example) [people are like machines or animals; borrowing from naturalistic science]
- Statistical Averages (for whole group)
- Statistical Probabilities (from sample)
- Measurement Theory- "error" as unexplained variation
- Computerized statistical analysis—mainframe in 1960's, P.C.'s in 1980's.

B. Trends in statistical procedures

- Correlational procedures
- Regression (predictions from data)
- Comparing groups (significant differences?)
- Inferential statistics (infer from sample)
- Cause/Effect relationships (by researcher deciding who gets what condition)
- Meta-analysis—pooling data across studies

- Comparing groups (significant differences?)
- Inferential statistics (infer from sample)
- Cause/Effect relationships (by researcher deciding who gets what condition)
- Meta-analysis—pooling data across studies

C. Trends in Testing and Measurement
- Testing mental abilities (late 19th century)
- Testing and the military (WWI and WW2)
- Measuring school achievement (California tests given every few years in school)
- Predicting achievement from standardized measurements (especially IQ)
- Item difficulty and discrimination theory
- Standardized test cutoff scores for children (e.g. to graduate or to enter kindergarten)

D. Historical Trends: Research Designs
- Educational Surveys (late 19th century)
- Simple Experiments (early 20th century)
- Procedures set for experimental design (Fisher—for whom the F ratio is named)
- Longitudinal designs (1930's)
- Validity issues (summarized by Cook and Campbell, 1979)

Are there any parallels between quantitative research and the Bible?

III. The Historical Development of Qualitative Research

A. General Influences
- Anthropology—study of tribal groups in late 1800's and 1900's (no methods classes)
- Sociology of early 1900's—studied poor, immigrants, inner city Chicago
- Piaget, Freud, and others in psychology (now beginning to re-emerge in psych)
- Education—in the 1970's, outgrowth of philosophies of naturalism and humanism

B. Qualitative Research: Philosophical Ideas
- Naturalistic Inquiry or Constructivism

  --consider the participant's point of view—they construct understandings and perspectives (phenomenology; meanings subjectively experienced)

  --describe setting or context (influences behavior and meaning of behavior)

- An alternative perspective to traditional research—move away from being objective to importance of subjective meaning (reaction to natural science view of humans—are people like rocks, animals?)

C. Qualitative Research: Procedural Developments
- Central Phenomenon rather than research question or hypothesis (these can be outcomes of research, not the beginning)
- Methods such as interviews, observations (less structured so the person's views are central, not the researcher's)
- Designs such as case studies, grounded theory and narrative (stories)

D. Qualitative Research: Advocacy Practices
- The qualitative researcher is not objective, neutral observer (admit bias)
- The qualitative researcher is a participating observer—involved in what happens
- The meanings of the research are plural, political and open
- The project is collaborative—a product of what you and those studied do together

Any parallels between qualitative research and the Bible?

IV. Characteristics and Definitions of Quantitative and Qualitative Research

A. Characteristics of Quantitative and Qualitative Research in the Process of Research

[figure 2.2 on page 51—key chart to understand entire textbook]

Overhead

B. Definitions of Qualitative and Quantitative Research (p. 58)

<u>Quantitative Research</u>

Quantitative research is an inquiry approach useful for describing trends and explaining the relationship among variables found in the literature. [A variable is anything that varies (it is vary-able; able to vary)—if it cannot vary, it is not a variable.] To conduct this inquiry, the investigator specifies narrow questions, locates or develops instruments using statistics. From the results of these analyses, the

researcher interprets the data using prior predictions and research studies. The final report, presented in standard format, displays desire for *objectivity and lack of bias.*

Qualitative Research

Qualitative research is an inquiry approach useful for exploring and understanding a central phenomenon. To learn about this phenomenon, the inquirer asks participants broad, general questions, collects the detailed views of participants in the form of words, images, sounds and artifacts, *and analyzes the information for description and themes. From this data, the researcher interprets the meaning of the information drawing on personal reflections and past research. The structure of the final report is flexible, and it includes the researcher's* possible *biases and thoughts.*

V. Research Designs

A. Quantitative and qualitative designs and uses

[figure 2.4 on page 59—overview of second half of textbook]

Three overheads

B. Choosing between qualitative and quantitative designs

- Audience accepts the approach as valid
- Your training and experience fits the approach
- The problem fits the approach
  - --quantitative when the study involves description or relationships between variables
  - --qualitative when the study involves exploring and understanding a process, event, or concept (complex or little-known issues)
  - --usually it is best to be primarily one general design and include some of the other (figure 2.1)

WILL YOU USE A PRIMARILY QUANTITATIVE DESIGN FOR YOUR RESEARCH PROPOSAL OR PRIMARILY A QUALITATIVE DESIGN?

HOW CAN YOU INCLUDE AT LEAST SOME FROM THE OTHER GENERAL DESIGN?

WHICH OF THE SPECIFIC DESIGNS SOUNDS MOST INTERESTING TO YOU AT PRESENT?

--for your research proposal

--if you do option 1, for your design chapter

Identifying a Research Problem

Adapted from Creswell chapter 3 by Ron Shope and Don Ratcliff

I. Research Problem Defined

A research problem is an educational issue or concern that an investigator presents and justifies in a research study.

Appendage: A research "problem" is not always a difficulty or something negative, rather it is an unknown that needs to become known. Sometimes "issue" or "topic" comes closer to the meaning of "problem" here; the answer to the "problem" is the results of the research conducted. It can be a literal problem, or it can just be an important concern.

Question to Ask to Find the Research Problem

- What was the issue or problem that the researcher wanted to address?
- What is the concern being addressed "behind" this study?
- Why was the study undertaken in the first place?
- Why is this study important?

II. Distinguishing the Research Problem From Other Research Steps

- A ***research problem*** is an *educational issue* or *problem* in the study
- A ***research topic*** is the broad subject matter being addressed in a study.
- A ***purpose*** is the major intent or objective of the study.
- ***Research questions*** are questions the researcher would like answered or addressed in the study.

Funneling Down: Topic, Problem, Purpose and Questions
(figure 3.1 on page 69—draw a funnel so large end is at the top--"topic" and the spout is at the bottom--"research questions")

Overhead

Look at "High Versus Low Control at Recess"
--identify the topic/problem
--what is the justification?
--what are the deficiencies in the literature?
--what is the audience

III. Can and Should the Problem Be Researched?
[These help screen potential issues for research; which possible topics and issues that have been considered should be deleted from your options?]

- Determine if the study will contribute to educational knowledge by advancing research.
- Determine if the study will contribute to educational knowledge by adding to effectiveness or practice.
- Determine if there is adequate access to participants and research sites.
- Determine of you have the skills, resources and time to conduct the study.

IV. Questions Regarding Contribution to Knowledge and Practice

- Does the study fill a void or contribute to existing research?
- Does the study essentially replicate a study with new participants or new sites?
- Does the study address a new problem or has this problem been understudied?
- Does the study give voice to people not heard, silenced, or rejected in society?
- Does the study inform practice?

V. Determining the Research Approach

A. Use *quantitative* if your research problem requires you to

- Measure Variables
- Assess the impact of these variables on an outcome
- Test theories or broad explanations
- Apply results to a large number of people

B. Use *qualitative* if your research problem requires you to

- Learn about the views of the people you plan to study
- Assess a process over time
- Generate theories based on participant perspectives

- Obtain detailed information about a few people or research sites.

VI. Introducing the Problem

A. Introducing the Topic: The Narrative Hook

- The Narrative Hook is the first sentence of the Study
- The Narrative Hook performs the following functions:
  - causes the reader to pay attention
  - elicits an emotional or attitudinal response from the reader
  - causes the reader to continue reading

Try writing a narrative hook

B. Stating the Research Problem

- Questions to ask:
  - What is the issue or concern the author is addressing?
  - Is there one issue or several in the study?
- Types of problems
  - Practical research problems
  - Study-based research problems

Try writing a statement of the research problem

C. Justifying the Research Problem

- Suggestions from other researchers
  - conferences
  - reports (usually at the end)
  - summaries of the literature
- Personal work experiences or issues you have heard about from others
- From deficiencies in prior research

Why is this problem important?

D. Identifying Deficiencies in the Evidence

- Literature or practical experience do not address the research problem
- Limitations in theories used
- Deficiencies related to method

- Deficiencies or limitations related to sample (people studied)
- Context/s of prior studies is/are limited
- Other limitations and deficiencies

What's missing in the previous literature?

E. Relating the Discussion to the Audience

Overhead

- Visualize the statement of the problem as the first five paragraphs
  - topic
  - research problem
  - justification
  - deficiencies
  - relate discussion to audience

Who is the potential audience for the research?

VII. Flow of Ideas in a Problem Statement

(figure 3.4 on page 79; this includes steps 1 and 2 of the chart on p. 69)

Appendage: The steps in this chapter are really great, and they give you excellent guidance in developing a statement of the problem. However, they are not absolute; they are not unbending rules. There may be other expectations if you do additional work at other schools or in other programs. Beginners need clear guidelines, and I am sure many researchers and teachers would say these guidelines are good.

In fact, even the chapter-by-chapter steps in the textbook are not absolute either. Creswell often describes things as 1, 2, 3, 4, etc., sort of like a cookbook. But there are other textbooks with different steps and even some books that say you cannot boil it all down to a series of steps. Such books are not wrong, indeed they are probably closer to the complexity of research than the easy, how-to-do-it cookbooks. But if you are just beginning to cook up some research, a cookbook can be very helpful. Just don't make it your Bible; there are other ways of putting it all together.

Reviewing the Literature

Adapted from chapter four of Creswell by Ron Shope and Donald Ratcliff)

Literature reviews and the Bible?

Primary versus secondary sources in Bible

Primary versus secondary relationship to God

Beth Patton Handouts and Presentation: Strategy for Education Research and Evaluating Sources of Information (including information on the internet)

I. Functions of Literature Reviews

A. Literature Review in a Quantitative Study

- Documents the importance of the research problem at the beginning of the study
- Supports the theory or explanation used in the study
- Foreshadows the research questions
- Provides an explanation for the results in other studies and in the theoretical prediction at the end of the study.

B. Literature Review in a Qualitative Study

- Documents the importance of the research problem at the beginning of the study
- Does not foreshadow the research questions (which are broad in scope to encourage participants to provide their own views)
- Is used to compare and contrast with other studies at the end of the study

II. Designing and Conducting a literature review (overview)

- Identify key terms
- Locate literature
- Read and evaluate the relevance of the literature to your topic
- After selection, organize the literature into a coherent picture of studies and documents on your topic
- Write a review by developing summaries of the literature

A. Identifying key terms
- Write a preliminary "working title" for the project and select two or three key words that capture the essence of the project
- Pose a short general research question that you would like to answer in the study
- Look in a thesaurus of terms to find words that match your topic
- Scan the contents in your library stacks and the table of contents of educational journals

B. Locate the Literature
1. Classification of Sources
2. Examples of Sources
   - Stacks in the Library
   - Data Bases (e.g. ERIC, First Search)
   - Encyclopedias
   - Summaries
   - Dictionaries and glossaries of terms
   - Handbooks
   - Statistical indexes
   - Reviews and syntheses

C. Evaluating the relevance of the literature: Questions to ask
- Topic relevance: **Is the literature on the same topic as your proposed study?**
- Individual and site relevance: **Does the literature examine the same individuals and sites you want to study?**
- Problem relevance: **Does the literature examine the same research problem as you propose in your study?**
- Accessibility relevance: **Is the literature available in your library or can it be downloaded from a web site?**
- Time relevance vs. quality of report:

[see figure 4.2 on page 93]

Current research tends to be within ten years or so for most topics, but classic literature can go back decades. Time line denotes the aging of research but also quality improvement. [Expands on text]

1. Research conducted
2. Papers on web sites, drafts of papers for conferences, conference presentations—can be during but more often soon after the research is completed
3. Dissertations, theses—within a few months of completing the research
4. Indexed publications (see text examples)—often within a year or two of completing the research
5. Journal—usually one to two years after the research
6. Book or citation to a journal in database—at least another year after the research in most cases
7. Books that survey research—five to ten or more years after the research

D. Organizing the literature

- Copy and file materials
- Construct a Literature Map
  - Identify key terms for the topic and put them at the top of the map
  - Sort studies into topical areas or "families of studies."
  - Provide a label for each box which will become a heading for the review
  - Develop the map on as many levels as possible
  - Draw a box toward the bottom of the figure that says "my proposed study"
  - Draw lines connecting the proposed study with other branches of the literature

[See literature maps in Creswell—figures 4.14 and 4.15]

Appendage: *My opinion, for what it's worth—literature maps help some people, they confuse others; plain outlines can be as helpful for some of us.*

E. Writing a review of the literature

- Identify and summarize each study in an "abstract" that highlights important elements
- Write out complete citations for the summaries with headings that use appropriate style manual formats
- Write the review using writing strategies related to the type and extent of the review

Quantitative and Qualitative Abstracts

Quantitative	Qualitative
1. The research problem	**1. The research problem**
2. The hypothesis or research questions	**2. The central phenomenon**
3. The data collection procedure	**3. The data collection procedure**
4. Results of the study	4. Findings

F. A few additional comments by Dr. Ratcliff:

- A literature review may extend into the actual research part of a study and even after the research to some extent, particularly in qualitative studies.

- A literature review should be primarily ***primary sources*** (first-hand accounts of research) and only secondarily include ***secondary sources*** (summaries of other people's research. As a rule, avoid statements of opinion and ideas that do not make reference to research, unless it is an absolutely top authority in the field, and then minimize the ideas.

- Work to get sources less than ten years old if at all possible, although in a full literature review some classic sources—those that almost everyone who writes on the topic mentions—can be included that are older than ten years, or if the sources are of historical value to set the context.

- A literature review ***can*** be infused throughout a study, rather than be a separate section (most likely in qualitative dissertations and theses).

- The standard literature review is a ***substantive*** review (reviews the research results of related studies), but you could also have a ***methodological*** review of the literature (reviews the research methods used in related studies). By adding a methodological review, you can discover the most commonly used methods on a topic—those approaches are usually more trustworthy, but it is also possible that different methods could produce new perspectives and understandings of the topic.

- Do not be too literal about all the phases of a literature review—there are variations in the way people do it and how schools want it—but Creswell's approach is a very good way to get started.

Literature Review and Computers

By Don Ratcliff

"Treeing backwards" means to find a good research report, look at the references at the end and locate those that sound interesting. This is an especially good idea when several good reports cite the same reference—it may be a classic study to consider.

"Treeing forwards" refers to finding more recent research that cites classic studies. Only one major resource allows you to do this directly: ***The Social Science Citations Index*****,** although you may be able to input the name of the classic studies and have a database do a full text search for that title (which will be in the references of later articles). You will need to find a large library to locate ***The Social Science Citations Index*** (it is an expensive resource and even most academic libraries do not have it). Some sources that are on the internet can be treed forwards using search engines.

Boolean operators are computer-based procedures to mix multiple terms in a database. For example the operator "and" brings up documents that have both the word before the and the word after, but the two words only have to be somewhere in the documents, not necessarily together. The term "or" will bring up documents that have the first word or the second word somewhere in the document ("spirituality or faith" would give you documents that have either of these terms). The term "not" will bring up documents with the first word but lack the second word ("spirituality not Buddhism") would give you

documents that have the word "spirituality" except for those documents that have the word "Buddhism" in them). There are other operators as well.

Proximity operators—These are similar to Boolean operators except that they relate to the closeness of the terms in the document. For example "near1" means the two search terms can have one word between them (for example "children's near1 spirituality" will give you documents that have phrases such as "children's basic spirituality"), "near2" means the two search terms can have two words between them, and so on. If the one search term must follow the second, such as finding the phrase "children's spirituality" you would use "with," such as "children's with spirituality."

Truncation—in searching a database you can state part of a word and it finds all of the words that are extensions of that word, such as child# can give you sources related to children, childcare, and so on (some databases uses * instead of #). In contrast, gol? will only supply one letter in place of the ?, such as gold and golf, but not golden.

Appendage: While your text presumes that the literature review is a separate section of a report or book, this is not always the case. My entire dissertation did not have a literature review! The reason was that I embedded my literature review throughout the entire dissertation. That is not standard practice, but you do find it occasionally in qualitative research.

In addition, the text appears to presume that the literature review takes place prior to research. Actually, in qualitative research there is an old tradition that the literature review not take place until the end of the research (so prior theories don't "contaminate" the results). However, today it is more common to do some of the literature review before, during, and after data collection in qualitative research.

Also note that your text uses APA version 4, and now it is in version 5.

Beth gave a good overview for library database and internet literature searches. Here I will add a few key computer terms.

ISP—"internet service provider" the service to which your computer connects to obtain the internet

Browser—program that shows you web pages.

FTP—"file transfer protocol"—uploads and downloads files from the internet.

Listserv—email goes to a central computer and is distributed to everyone who is a subscriber, thus large group discussions can take place.

News group—discussion group, but discussion is posted and you can read and respond.

URL—"uniform resource locator"—unique address for a document on the internet (such as don.ratcliff.net).

HTML—"hypertext markup language"—the language of web pages; allows pictures, hyperlinks, and many other interesting features. To view the html of any web page, load the page then click on "view" (at the top) then click on the "source" option.

Search engine—searches internet for sites, although your use is to search the web pages it has discovered using key terms and phrases.

Subject directory—categorizations of web sites.

Meta-engine—sends a request to several search engines simultaneously.

Domain extensions—the last three letters of a web page address, which gives a rough idea of credibility. The most common are (from most credible to least credible): edu, gov, org, net, com, but you can find both good and terrible things on each of these.

Note: If you want a copy of *Biola Library Research Tools and Skills Manual for Educational Ministry Leaders*, just drop me an email and I'll send it as an attachment.

California technology standards require training in using:

ERIC

Wilson Select

LEXIS-NEXIS

EBSCO OnLine Citations

So learn them well! How? Use the Biola library web page!

Specifying a Purpose, Research Questions, or Hypothesis

Adapted from Creswell chapter five by Ron Shope and Don Ratcliff

Prov. 16:1-3

I. Specifying a Purpose, Research Questions or Hypotheses

- **Purpose statements: a declarative statement that advances the overall direction or focus for the study.**
- **Research Questions: Interrogative statements that narrow the purpose statement to specific questions that researchers seek to answer in their study.**
- **Research Hypotheses: Declarative statements in quantitative research in which the investigator makes a prediction or conjecture about the outcomes relationship.**

overhead

Gives examples from dissertation research, discuss topics being studied in class and students with instructor will work at some purpose statements, questions, and hypotheses

- **Null hypothesis**

Appendage: Students often ask why there is a null hypothesis. There are actually two ways of answering this question. One is related to the philosophy of science, and comes out of the work of Karl Popper and his famous book *The Logic of Scientific Discovery*

(1959). He emphasizes that conclusions are always tentative, but we can be more certain when a hypothesis does not hold true, because if it does appear to be the case in a given situation, it may be due to other factors besides the independent variable. His actual rationale is far more complicated than this, but perhaps this gives you a feel for where he is coming from.

The second reason comes from the area of statistics. From the perspective of probability (upon which statistics is based), no difference between two scores is obvious when the means coincide. As the two means move apart from each other (in other words, there are greater differences between the scores in the two conditions as seen in the dependent variable), it becomes more and more likely that those differences in your sample will represent genuine differences in the population as a whole. When you reach the "critical value," that difference is considered significant statistically. Thus the null is retained until the two values of the dependent variable move beyond the critical value.

I must admit, both rationales are difficult to comprehend, even if you have had several classes in research and statistics, and have even read some of Karl Popper. Perhaps what is most important is to be sure you use the right terminology about the null and alternative hypotheses. When we reject the null hypothesis, we do so at some statistical level. For example you might say "reject the null hypothesis at the .01 level" which means there is less than 1% chance that what you found in your sample does not hold true for the population from which you sampled (assuming you did a valid sample as well as valid procedures). But you can never say "The study proved the hypothesis," although it might be acceptable to say "the results are consistent with the alternative hypothesis." You might even say the results support the hypothesis, but *never* say "the hypothesis was true." We just cannot be that certain, given the limitations of the research process and probability theory in statistics.

What if you find that the alternative hypothesis was *not* correct? Technically you would conclude that you "failed to reject the null hypothesis." Avoid stating things like "the null hypothesis was true" or "the study proved the null hypothesis?" In sum, only God knows all of the situations, and the closest thing we have to laws of human behavior are those in the Bible (such as "all have sinned").

- Alternative hypothesis
- Directional vs. non-directional hypotheses

Examples of each from dissertation, have students generate more examples

[Distinguishing purpose, questions, and hypotheses—figure 5.1 on p. 126]

II. Variables in Quantitative Research

[Definition of a Variable-figure 5.2 on p. 129]

overhead

Appendage: How do you know what the relevant variables are? Actually you may not know, so qualitative research may be needed to find what the most relevant variables are in a given situation. On the other hand, the literature on the topic is likely to indicate at least what others feel are the relevant variables (they may not have all of them, of course, and thus there may be need to do additional qualitative research to discover them). Another way to find relevant variables is to take your topic or problem and explore it with "if-then" statements, guesses at cause and effect. The possible causes and possible effects are most likely to be variables, although probably variables that need to be refined and explored in greater detail—probably with qualitative research--before being used in a quantitative research study.

A. Constructs Versus Variables:

- **A Variable is an attribute or characteristic stated in a specific or applied way**
- **A Construct is an attribute or characteristic expressed in an abstract, general way.**

B. Categorical, Ordinal, and Continuous Scores

- **A** ***categorical score*** **is a value of a variable assigned by the researcher into a small number of categories. (e.g. Gender)**

- **An *ordinal variable* is the value of a variable in terms of rank order (first, second, third, etc.)**

- **A *continuous variable* is the value of a variable assigned by the researcher to a point along a continuum of scores, from low to high. (e.g. Age)**

C. Families of Variables

- *Independent Variable*: **An attribute or characteristic that influences or affects an outcome or consequence (the "cause").**
  - Treatment Variable or pre-existing differences

- *Intervening Variables (Mediating Variables):* **An attribute or characteristic that "stands between" the dependent and independent variables (*can increase or suppress effects*).**

- *Dependent Variables:* **An attribute or characteristic influenced by the independent variable (at least theoretically) (the "effect")**

overhead

- *Confounding Variables (Spurious Variables):* **Attributes or characteristics that the researcher cannot directly measure because their effects cannot be easily separated from the other variables, even though they may influence the relationship between the independent and the dependent variable.**

  --can be pre-existing difference or intervening variable, or just a result of doing the experiment ("reactivity")

[The Family of Variables in Quantitative Studies—figure 5.3 on p. 131]

[Intervening Variables--figure 5.4 on p. 135]

[Theories as Bridges Between Independent and Dependent Variables—figure 5.5 on p. 137]

overhead

Read over "High Versus Low Control During Recess" article during break. What are the:
*independent variables
*dependent variables
*potential confounds
*theories
*purpose
*questions
*null and alternative hypotheses (implied in the above, not overtly stated)

Examples of purpose, questions, and hypotheses in my dissertation

D. Whether Variables Prove Probable Cause

- **Probable causation: The researchers attempt to *establish* a likely cause/effect**

relationship between variables rather than *prove* the relationship (not *laws* as in physics).

- ***Control* is vital: *Control* means that the researcher attempts to study (and make consistent if possible) all factors that might help explain the relationship between an independent and dependent variable.**

- ***Superstitious behavior*: Accidental convergence of variables, thus people believe one causes the other, but they are inherently unrelated.**

overhead

[Four Types of Probable Causality—Figure 5.7 on p. 140]

overhead

Appendage: **On the next page is a diagram that reflects levels of understanding perspectives in research. While you are familiar with the terms "theory" and "hypothesis" it is likely that "paradigm" is a new term for you. A paradigm refers to the overall assumptions and approach in a given area of study. This idea was developed by Thomas Kuhn in *The Structure of Scientific Revolutions* (1962). That paradigm tends to hold full sway over the way people look at their world, and science, in a given era of time.**

For example, authority was the emphasis in the Middle Ages, and thus people believed the earth was in the center of the universe because the Pope and other authorities said it was. Scripture was thus interpreted in line with the authorities, which appeared to confirm the authorities (we know now, of course, that this was a misunderstanding of the Bible, but it is important to see that it was

not the Bible, but the authorities—especially religious and political authorities—that held sway over people's views of reality and science.

During the Reformation/Enlightenment era there was a move away from human authority and toward a reliance upon observation and the scientific method. This was, at first, not a move away from God, but rather a shift away from relying on human authority. It had its parallel in theology with an emphasis upon the Bible itself rather than how the religious authorities interpreted the Bible. Thus in science Copernicus (who, interestingly, was a cleric as well as a scientist) asserts that the earth is a medium sized planet circling around a second rate star in the galaxy, and rather than relying on authority he relies upon observation to make his case. This represents a paradigm shift from authority to observations as the basis for conclusions. Another paradigm shift occurs in the twentieth century as there is a shift from Isaac Newton's view of physics to Einstein's theory of relativity.

Some would say we are in the midst of another paradigm shift. Mary Stewart VanLeeuwen, now at Eastern College (a Baptist school), formerly at Calvin College, believes the paradigm in social science research is shifting from a mechanistic, natural science view of humanity (people as machines or at best sophisticated animals). Until recent years many researchers have assumed that people are best studied with methods that have been adapted from the natural sciences, and that—at least in theory—one can have a fairly complete understanding of people using such methods. Today that vision is being challenged (for its incompleteness by most, but a few would go so far as to say the whole paradigm was in error). VanLeeuwen, in her excellent book *The Sorcerer's Apprentice* makes the case that the present shift is a great opportunity for Christians, as people are becoming more and more open to the supernatural and the importance of meaning in life, and are emphasizing less and less the mechanistic view of humanity. This trend is reflected in the rapid increase in the popularity of qualitative research in psychology and education in the last couple of decades.

E. Four Levels of Understanding Perspectives in Research

BROAD

Paradigm (broadest level)
Kuhn's idea of paradigm shift (e.g. Copernicus, Einstein)
Overall assumptions to study, rarely changes
Example: naturalistic perspective of the world

↓

Formal Theory (relates to multiple topics and many contexts)
Based upon paradigm
Changes slowly; more likely to modify than to discard a theory
Example: behavioral theory—reinforcers increase behavior

↓

Middle-Range Theory (relates to specific topics and contexts)
May or may not be related to formal theory
Example: reinforcers increase behavior in elementary-aged children in classrooms

↓

Hypothesis (often specific to topic and may be context-specific)
--relationship between independent and dependent variables
Tentative, tested via research (usually quantitative methods)
Usually based upon theories—more efficient to use theory
Example: reinforcers will increase the attention of six-year-old learning disabled children

NARROW

F. Theoretical Flow of Research

Quantitative Research	Qualitative Research
Theory ↓ Hypotheses (deducted from theory for *this* situation) ↓ Test hypotheses via research ↓ Results confirm or do not confirm hypotheses ↓ Revision or extension of theory	Attempt to suspend theory ↓ Observe carefully context and activities, interview avoiding preconceptions ↓ Generate hunches, test hunches ↓ Create hypotheses from results of above tests ↓ In some cases, multiple interrelated hypotheses result in local theory or middle-range theories

Appendage: **Actually, it should be noted that qualitative research *can* begin with a theory. In my own research I used a very broad and somewhat vague set of theories (Hall's proxemic theory, school and peer culture theory, hidden curriculum theory, and symbolic interaction theory). I purposefully chose very "open" theories because of their flexibility to many situations. However, one could use a specific theory but instead of testing it, one could explore people's experiences in relation to situations where the theory holds up, or even their experiences in a learning or experimental context. One could also explore events that take place at the same time that the events predicted by the theory occur, or explore related contextual aspects of situations where a theory fits.**

G. Differences between quantitative and qualitative purpose statements and research questions

Quantitative - more closed	**Qualitative - more open-ended**
1. Probable cause/effect ("Why did it happen?") **2. Testing and adjusting theories ("Why did it happen in view of an explanation or theory?"** **3. Assessing differences and magnitude** -"How much happened?" -"How many times did it happen?" -"What were the differences among groups in what happened?"	**1. Descriptive ("What happened?")** **2. Interpretive ("What was the meaning to people of what happened?")** **3. Process-oriented ("What happened over time?")** 4. Can generate hypotheses, do preliminary testing of hypotheses, and even generate local theory or middle-range theory.

overhead

[How researchers explain or predict variables versus exploring or understanding a Central Phenomenon—figure 5.9 p. 147]

III. Qualitative Research Considerations

- **More open-ended**
- **The direction of the study is focused on how to best learn from the participants**
- **The focus of the research is around a** *Central Phenomenon* **which is an issue or a process the researcher would like to study.**
- **Qualitative research is built on an** *emerging design* **and can create emerging theory**

Collecting Quantitative Data

Adapted from Creswell chapter six by Ron Shope and Don Ratcliff

Daniel's experiment (Dan. 1:5-16) and Satan's experiment (Job. 1)

What were the independent variables, dependent variables, hypothesis possible confounds?

I. Permissions

What is the unit of analysis? Individuals, groups, classrooms, families, schools, etc.

What permissions are needed? Organization, site, classroom, participants (and parents if under 18), university research committee.

Two key factors that influence extent of review by URC

- Level of risk
- Special population needing special protection

II. Selecting Participants

Population vs. sample

overhead

Appendage: Sampling is important for generalizing results; it is a means of determining if the results of a study are likely to apply in other locations and with other people than those studied.

Samples are used because not everyone may fit what you want to study (need to sample a specific population) and it may be too costly or inconvenient to study everyone in a population (imagine the cost of interviewing all the fifth graders in the U.S.A.!).

Two general kinds of sampling procedures:

Demonstrate each of these using students in class

1. Probability sampling--sample clearly represents population

Appendage: Probability sampling in particular helps to avoid the potential confound of personal characteristics significantly determining the results. For example, if all the participants are chosen from one location, it may be the location or something about that location that is responsible for the results, rather than the independent variable.

A probability sample is created so that it represents the entire population, such as selecting 100 third graders from the population of all third graders in the country. If there is a probabilistic sample, then you can say *probably* the way they act in the study represents how third graders in general would act.

You state the probability that the sample represents the entire population by using p in the statistics. Thus $p < .05$ means the chances that the sample represents the whole is at least 95% with less than a 5% chance of error. Similarly, $p < .01$ means the chances the sample represents the whole is at least 99% with less than a 1% chance of error. In all cases, the p value is only the case if the difference reaches statistical significance.

A. Simple Random Sample—each person chosen randomly

Overhead table of random numbers

B. Systematic Sampling—every nth person
--need list of names, but don't have to number them all

C. Stratified Sampling—select characteristics, then randomly sample people who have those characteristics so that they are proportional to the population

Overhead: Proportional stratification sampling approach

2. Non-probability sample (may not represent a population)

A. Convenience Sample—willing and available people (commonly used if the research is not a survey)

Appendage: Volunteers are likely to be very different from non-volunteers in some ways. One must decide if that difference will be important for a given study. For example, motivation can influence results in studies, and volunteers are likely to be highly motivated. High motivation may result in people too eager to display some characteristic, but if motivation is too low they may not pay attention. Some participants may be highly motivated . . . to ruin your work!

Biased samples are a common problem. On TV, for example, they used to say "Four out of five doctors say . . ." but they never say who those four are. Perhaps all four were selected *because* they said what they did! Or perhaps all five were paid to say that, and the fifth one just decided to be honest!

The Burger King© "research"

B. Snowball Sampling—ask participant to name others who are likely to participate

C. Many others, usually used with qualitative research (8 more are listed on pp. 194-199).

What kind of sampling is used in "High Versus Low Control During Recess?"

How many in the sample?

Rule of thumb: As many as possible

Practically speaking, depends upon:

- Funding
- Access
- Time
- Number of variables to study
- Minimums on statistical tests

Appendage: How do you evaluate whether your sample is a good one or not? You need to evaluate this, but you should also provide information for readers to evaluate it as well. Guidelines:

- Describe the group in detail. Thus readers can assess if the group you studied is like the group to which they want to apply the results. Qualitative research actually emphasizes this more than quantitative results, but it is a good idea for both kinds of research. Ten aspects of students to consider include:
  1) race/ethnicity
  2) grade level/age
  3) degree of cooperativeness/other reactions
  4) academic track
  5) student/teacher ratio
  6) teacher typologies of students
  7) home environment [see previous section on setting]

8) number of students
9) common experiences with peers
10) socioeconomic status
(there may be others)

- Method of sampling needs to be clearly described—the exact procedure used

- On surveys, the return rate is an important aspect of sampling; a low return rate may suggest the sample is not as dependable. With a low return rate—say less than 60%--it is important to analyze why so many failed to respond and how those not responding are likely to be different from those who did respond.

- Did the selection of a site bias the results?

- Is there an adequate number of people in the sample? Small numbers of people make it harder to obtain significance on a statistical test, and if a very small number in the sample (say under 15) you may be forced to use a nonparametic statistical test where it may be very difficult to obtain significance.

III. Data Options

Operationalize your variables—define in measurable terms

Appendage: The concept of operationalization is implicit though rarely acknowledged in many qualitative studies. Observations should reflect tangible activities in all research, although impressions and ideas may be tracked separately.

What is the scale of measurement?

- Nominal—categories

- Ordinal—rank order

- Interval—no true zero and no assurance the differences between numbers are the same (common)

- Ratio—true zero, equal distance between numbers

"***How cold is it when it is twice as cold as zero degrees?"***

The most reasonable and preferred for many situations is the ratio scale.

In "High Versus Low Control at Recess" what kind of scale was used?

Kinds of measures:

Norm-referenced vs. criterion-referenced tests
(comparisons with a norm group vs. comparisons with a standard)

A. Performance Measures (IQ, aptitude tests)
B. Interest Tests--patterns of interests
C. Personality Tests--characteristics across situations
D. Attitude Measures--feelings/propensity to act
E. Behavior Observation--observe and code on a protocol
F. Documents--such as school records

In "High Versus Low Control During Recess," what kind of measure was used?

How do you decide which kind of measure to use?

What are you trying to learn about participants?

What data can realistically be collected?

How do the advantages and disadvantages of a measure?

Who records the data and in what manner is it recorded?

[also see guidelines on page 185]

See checklist overhead from "High Versus Low Control During Recess"

IV. Instrumentation, Data Administration

- Using a pre-existing instrument—good idea if there is strong evidence of validity and/or reliability in prior studies

-vs.-

- Adapting an instrument—next best option, but may require permission and previous validity/reliability data may or may not be usable

-vs.-

- Developing an instrument—a lot of work (the procedure is diagrammed on p. 179, a procedure developed by one of my teachers)

- Locating an instrument--four basic sources:

  - references in a research report,
  - ERIC,
  - Buros Mental Measurements Yearbook,
  - Tests in Print

- Reliability (consistency of scores)

A. Test-retest (give test at least twice, separated by time, and compare scores)

B. Alternative forms (give both forms together, compare the scores)

--Sample from "universe of items" (all the possible questions that get at the construct)

C. Internal consistency (split-half—how does the score on the even items compare with the score of the odd items)

E. Inter-rater reliability (two observers, compare their ratings)

F. Intra-rater reliability (same person observes the same event twice and compare the two ratings—only possible using video or audio)

Need to report reliability, and if low, work to reconcile differences, then report improvement in reliability (if any)

In "High Versus Low Control During Recess" how was reliability examined?

- Validity

  Generally depends upon: [let's think positive]
  - ●Quality of design
  - ●Participant's understanding and mental/emotional state
  - ●Scores predict outcomes
  - ●Quality of questions and measures
  - ●Usefulness and applicability

  Varieties:
  - Content validity—do questions represent the range of possible questions on the issue/construct (ask an expert)
  - Criterion-related validity—do the scores correlate with the immediate criterion (does test of math relate to current G.P.A. in math?)
  - Predictive validity—do the scores predict a later outcome (IQ tests generally predict grades in school for following two years)
  - Construct validity—test scores are compared using a theory of how scores should relate
  - External validity—do the results generalize to other settings?

- Standardized procedures—set procedures, including specific instructions to state, placement of objects, sequence, etc.

- Training observers:

  1. demonstrate how they should record data,
  2. trial run; let them try simulated recording of data,
  3. critique how well they do (hits and misses; reliability)

- Public documents. Do different sources give comparable information? (Income according to self-report vs. tax forms vs. government statistics)

- Ethical concerns:
    - Permission before you begin—but it is ok to contact potential gatekeepers about the *possibility* of a study
    - Confidentiality--names of participants not revealed by researcher, but can trace who did what (be sure to include the phrase "within legal limits" or "within the bounds of the law")
    - Anonymity—names of participants cannot be traced, even by the researcher; impossible to tell who actually participated

Review three quantitative designs [chapter two, pp. 59-60]

- Experimental/quasi-experimental
- Correlational
- Survey (but not all surveys; can be open-ended and more qualitative)

During this coming week:

Find a place that has a number of people, and count things in 30 second intervals for five minutes. Thus you will have ten tabulations for each of these behaviors:

1. Number of people walking: __ __ __ __ __ __ __ __ __ __

2. Number of people running: __ __ __ __ __ __ __ __ __ __

3. Number of people standing: __ __ __ __ __ __ __ __ __ __

4. Number of people lying down: __ __ __ __ __ __ __ __ __ __

5. Number of people sitting: __ __ __ __ __ __ __ __ __ __

6. Number of people doing something else: __ __ __ __ __ __ __ __ __ __

⇉ ⇉ ⇉ ⇉ ⇉ *DON'T FORGET TO SKIP CHAPTER SEVEN (FOR NOW)*

Analyzing and Interpreting Quantitative Data

Adapted from Creswell chapter eight by Ron Shope and Don Ratcliff

Devotional on numbers and the Bible

Statistics funny stuff

Rate these on scale from 1 (not funny at all) to 5 (very funny) and tally on board

Use data from observations done since last class and tally up scores similarly

I. Prepare and organize data for analysis

Assign numbers—a numeric value is assigned to what occurs

Types of scores:

- Single-item score—score on each question, observation, etc.
- Summed scores—adding scores on items related to the same issue or construct for each participant separately (on an IQ test you have a VIQ and a PIQ)
- Net or difference scores—change between pre and post test

Input the data (data sheets, computer)

II. Explore and analyze data

Cleaning data, account for missing data. How?

- Visually inspect for missing scores, impossible scores, and obvious errors (what is the error in table 8.2?)

- Run frequency distribution to see if any scores are outside coded range (obvious mistake)

- Either double check and change scores, or if you cannot check them, delete obvious errors

One of the most commonly used statistical programs, that comes in a student version, is SPSS

A. Descriptive Statistics (the ***most important*** and easiest to understand statistics.

Cuddle Ewe Underquilt data

- Measures of central tendency:
  - Mean—average

  - Median—middle score when listed highest to lowest score

  - Mode—score that occurs the most

- Measures of variability—how much do scores vary around the mean (average)
  - Standard deviation—average amount of variation from mean (67% of the scores are the mean +/– the S.D.)

  - Variance—square of the standard deviation (used regularly in advanced statistical procedures)

  - Range—highest minus lowest scores

Use data from cartoons in class, students use own data from the week, to calculate each of the above.

Score mean difference square of difference Sum of squares Average of the differences (ss/n) (the variance) Square root (the standard deviation)

- Percentile--percentage of people who scored lower than a given person

- Correlation—the degree to which two scores vary together

- Normal distribution, positive vs. negative skewed distributions

overhead

Note trends in data—get a general sense of results

The mythical town of Podunk, Georgia

[Note: percentages in figure 8.3 are rounded, and ignore percentiles]

Inferential Statistics:

Appendage: These statistics are termed "inferential" because you infer from the results of the sample (the descriptive statistics) whether the same results would be found in general in the whole population. You are "testing" to see if this is the case when you use an inferential statistical test.

Choice of statistical test depends upon:

- Which of the four kinds of scales the dependent variable is
- How many variables there are
- The distribution of scores (normal or skewed)
- Number of people in the sample

Some common statistical tests:

- T-test—compares two group means for significance.

- Analysis of variance (ANOVA) which produces an F ratio—determines if there any difference between several comparison groups (tells you if there is some significant difference, but does not tell which scores are significantly different; need another test to discover which specific groups are different). Requires normal distribution of scores, interval or ratio data. Powerful test.

- Chi Square—can be used with any of the scales of measurement, skewed distributions, and small numbers of participants. Not a powerful test.

III. Hypothesis testing

- P value is to be determined in advance of the study, based upon what is customarily used with the topic and how important it is that the inference be correct (what chances of a mistake are acceptable—1 out of 20 ($p < .05$), 1 out of 100 ($p < .01$), etc.)

- Power of test—likelihood of rejecting a null hypothesis accurately (more powerful means more likely to get significant differences)

- If the hypothesis is one direction, you are twice as likely to achieve statistical significance compared with a two direction hypothesis

- Statistical significance does ***not*** automatically mean practical significance (effect size gets more at practical significance)

IV. Summarize the data and represent in tables, figures, discussion

Figures

overheads

- Bar charts
  - Histogram does not have separate bars (see p. 236 for an example)

- Scatterplots

- Line graphs

How statistics are stated in an article:

- M is mean

- S.D. is standard deviation
- Letter before the parenthesis is type of statistical test (F is F ratio for an ANOVA, t is t test, many others)
- Number/s in the parenthesis is/are degrees of freedom (number of scores free to vary), often closely related to the number of people in the study or at least one phase of the study
- Number after parenthesis is the test statistic (the number that results from using the statistical test)
- Number after p is the probability value

Explanations should reflect not only what the research says about the hypotheses, but also what the research says about the theory/theories involved.

V. Conclude by summarizing key findings

- Be sure to state the limitations of the research:
  - To what degree the results can be generalized
  - Methodological limits
  - Your limits as a researcher
  - Other weaknesses

  It strengthens the credibility if you admit the limitations, and every research study has its limitations.

- What does the research suggest about the need for future research? This helps future researchers know what needs further work—this section of an article or book is a good place to get ideas for research as well; look in the conclusion of the research study.

Data print out of SPSS data from "High Versus Low Control at Recess"

Collecting Qualitative Data

Adapted from chapter seven of Creswell by Don Ratcliff

A qualitative research-like study in Numbers 13

- Four aspects of promised land are studied in detail.

I. Gaining permission to do research

Gatekeeper—provides entrance, helps locate people and/or places to do study. May be an official (principal) or unofficial (secretary, custodian).

II. Selecting participants and sites

Sometimes qualitative researchers distinguish *sampling* that produces participants, and *selection* of a site to research.

A. Purposeful Sampling methods

(adapted from Michael Quinn Patton's 16 methods, p. 230 in third edition of *Qualitative Evaluation and Research Methods*)

1. Maximal variation sampling—common themes across large variations of sites or people, or emphasize what varies

2. Extreme case sampling—"deviant case"—unusual, special (troubling or very enlightening)—can learn from extremes

3. Typical case sampling—first you need to find what is typical via survey or demographic information, then look for a situation that fits the typical

4. Homogeneous sampling—small group of very similar people (focus groups use this kind of sampling)

5. Critical sampling—critical case to make a point vividly: "if it happens here, it will happen anywhere," or "if it doesn't happen here, it won't happen anywhere." Pick a site that gives the most information; what are the key aspects you are looking for?

6. Opportunity or "fortuitous" sampling—just presents itself, so you follow it up

7. Snowball sampling—find one person with desired characteristics, who tells you about another person that you contact, who does the same for a third, and so on
--often used when specific kind of person is rare or not socially acceptable or even deviant or illegal activity involved

8. Confirming or disconfirming sampling—look for a group that does not fit expectations (shows the limits of a trend), or one that confirms expectations to elaborate a concept or trend

III. Identifying Data to Collect

If a person goes on a tangent, do you draw them back to the question you asked? Need to get ***their*** view of the world, not just answers.

Four kinds of data collection methods:

1. Observations

What roles are possible? Many!

|----------|
Participant Observer

What role did I take in "My Exotic Tribe?"

Roles vary according to phase of research and in field/analysis (cycle between being more participant or more observer/analyst

Initial "shagging around"

"Funnel down"—broad to narrow focus over time

Context description—as if an alien ("etic" in contrast with "emic") "studied naivity"

"Teachers are as aware of school environment as a fish is of water."

Describe room for five minutes

Person description—as if a best friend (emic)

Videotape (sometimes distracting), cassette recording (less distracting usually, may take notes on what you see by talking very quietly into microphone), computer notes (can crash, key sounds distracting), or write on paper (often best, at least as a supplement to vide, audio, and/or computer)

Four kinds of notes:

Handout

- Field notes-- Describe behavior and physical context
- Theoretical notes-- Describe trends and hunches, hypotheses that emerge
- Methodology notes-- Note methodological issues and changes (and reasons for changes)
- Personal notes-- Note personal feelings and interactions in personal notes

Try writing personal notes on your observations of room/video

2. Interviews

(excellent guidelines on pp. 207-208, also see comments about interview probes p. 209)

Robert Coles video—"Listening to Children"

Overhead picture from my research

Transcribe (takes time, can miss nuances of voice), partial transcription (listen repeatedly to tape, take down key quotes), or just use notes (fragmented, miss a lot)?

Open-ended or semi-structured interviews? Structured, closed ended interviews are more typical of quantitative research, while unstructured usually means informal comments, off the cuff comments--sometimes can be the most revealing.

|----------|

Structured			Unstructured
Closed-ended	Semi-structured	Open-ended	Few or no questions

Media alternatives:

- Audio tape,
- videotape, or
- no recording?
- Partial or full transcription?
- Analyze tape? [Get nuances, tone of voice, hesitations, etc. But may not get needed distance.]

Context alternatives:

1. One-to-one
2. Group (including focus group)
3. Telephone (usually quantitative surveys)
4. Email

3. Documents

Journaling

Mapping

Public

Private

4. Audio-visual materials

Physical trace evidence—evidence something happened (yard trashed means dog got loose)

Photographs—for elicitation, documentation of research, or let participant photograph

"God's Photo Album"

Videotape—as data vs. elicitation
(my book at http://don.ratcliff.net/qual)

Email

Recorded sounds

Artifacts

IV. Three Qualitative Designs:

- Grounded Theory Design
- Ethnographic Design
- Narrative Research Design
- [Many others]

V. Observation Protocols

Children's rituals data sheet

Videotape of school hallway

Descriptive Notes	Reflective Notes

Data Analysis in Qualitative Research

Adapted from chapter nine of Creswell by Ron Shope and Don Ratcliff

Devotional on metaphorical analysis: Prov. 27:8, 15-17, 19, 21, 22

Devotional on triangulation—parallels in Old Testament judicial system of two or three independent witnesses needed to convict. When interviewed independently, do the testimonies match up?

Data collection and analysis are:

- Simultaneous—collect and analyze during same phase
- Iterative—cycle between collection and analysis
- Emergent—self-correcting and changeable
- Multiple—numerous methods possible
- Subjective—for participant and for researcher to some extent

I. Three aspects of preparing and organizing data

- Organizing into files—computer, literal folders, or cards
- Transcribe data—partial or complete:
  - sample from all observations/interviews or
  - sample within a video or interview or
  - direct analysis and transcribe key parts
- Alternatives
  - computer analysis—Atlas and Nvivo get best comments
  - manual analysis—paper and paste/tape
  - hybrid—use computer word processor for word and phrase searching, use “tables” function to insert codes, additional files for combining coded sections (but keep original files intact)

II. Explore data—read and memo to self, to get the big picture

Listen to interview of fourth graders and follow with transcript

III. Develop themes and descriptions

- Code—label segments (phrases, sentences, multiple sentences). Code by asking, "What is this about?" "What's happening here?" and "Of what is this an example?"

[do this with interview transcript or observation notes]

- Reduce codes to themes—eliminate redundant codes, find common categories (themes) that several codes relate to. This is a higher level of abstraction than codes. At least temporarily ignore codes that do not fit categories/themes (you may pick up the extra codes in later analysis).

[do this with interview transcript or observation notes]

- Describe—try to describe events, people, or place/s, using a theme or category that has emerged, filling it out with description of codes and including quotes and paraphrases of original text. Quotations in descriptions are *evidence*. Sometimes you even get to name new constructs!

Appendage: Usually the above three are spread out in time—you begin with coding during earliest days of data collection and analysis, then move into code reduction and theme/category development after a few days or weeks (but continue to code new data), then add description during later phases of data collection and analysis. Thus in figure 9.4 (page 266), 1, 2, and 3 are simultaneous, while 4 is added a bit later, and 5 even later, and description even later. However, you could try all six even after the first day of data collection. If you do all six every day of data collection, you will do a lot of writing and re-writing!

Look for contrary evidence—an analysis procedure that can be termed "analytic induction" when used as a formal procedure

Saturation of categories—additional data does not provide new information.

IV. Representing findings

overhead

- Layer analysis—move upwards to more complex and abstract levels of analysis -and/or-

- Interconnect themes/categories. Charts and diagrams ("visual displays") can help portray the connections. Best source for hundreds of kinds of diagrams and charts for qualitative research: Miles and Huberman (1994)
  -and/or-

- Metaphorical analysis can add vividness to description. Be sure to check it with participants, or even have them create, extend, and/or correct metaphors. Even third and fourth grade students did this for me: "I'm a steamroller, baby."

  overhead

V. Interpretation

- Personal reflections—can get more subjective in perspective at this point

- Compare with literature—embed results in context of previous literature

- Note limitations and suggestions for future research

VI. Validity issues

- **Triangulation—comparing information from a various perspectives—when perspectives coincide, evidence of validity (yet differences reflect divergence and multiplicity, not necessarily lack of validity).**
  Can triangulate:
  - **Participants—e.g. kids vs. teachers, levels of administrators**
  - **investigators (team)**
  - locations within a site—e.g. classrooms, classroom vs. cafeteria
  - sites—e.g. urban vs. rural schools
  - populations—e.g. third graders vs. fourth graders
  - times (time of day, of week, of season)
  - methods of collecting data
  - methods of analyzing data

  - theories (within or across disciplines)
  - paradigms (quant/qual)
- Member check—participants respond to your ideas and conclusions—Did the researcher get it right? Does it fit?

- External audit—usually not literal audit, but keeping sufficient notes of what was done and why so that the study *could* be audited.

Reporting and Evaluating Research

Adapted from the Creswell text by Ron Shope and Don Ratcliff.

I. Writing for the Audience

- **Determine the acceptable standards**
- **Look in journals to learn the criteria required for submitting articles**
- **Look at the literature for specific standards**
- **Check with the school to determine specific standards for a thesis or dissertation**

II. Types of Research Reports and Proposals:

- **Research Report: a completed study that reports an investigation or exploration of a problem**
  - Dissertations and theses
  - Dissertation and theses proposals
  - Journal articles
  - Conference papers
  - Conference paper proposals

III. Identify the Physical Structure

- **Examine the APA heading styles**

- **Examine the six steps in the research process**
- **Examine the research questions or hypotheses**
- **Examine the structures or different types of reports**

A. Structure of Quantitative and Qualitative Proposals

Quantitative Format	Qualitative Format
1. Title page **2. Abstract** **3. Introduction** **4. Review of the Literature** **5. Methodology** **6. Timeline, Budget, and Preliminary Chapter Outline** **7. References** **8. Appendices**	**1. Title page** **2. Abstract** **3. Introduction** **4. Procedure** **5. Preliminary Findings** **6. References** 7. Appendices

B. Commonly-found sections of a research report

1. Introduction/literature review

2. Procedures/Methods

3. Findings/Results

4. Discussion—sometimes divided into two subsections:
   - Interpretation of results
   - Conclusions/recommendations/limitations

     Occasionally "conclusions" are in a separate major section that may also include recommendations and/or limitations of the research.

Conclusions tend to be more lay-level language.

Recommendations include suggestions for future research or practice

5. References

"Limitations" tend to be related to:

- participants--often too little is said about the characteristics of participants; both researchers and readers too readily assume they are typical.
- circumstances under which the study was conducted—location and other specifics about the context.
- when the study was conducted, including time of day, day of the week, what season or part of the year, and the specific year.
- reactivity due to the research and researcher/s.
- the measures used

C. Variations in Structure of a Qualitative Study

- **Scientific model**
- **Storytelling model**
- **Thematic model**
- **Descriptive model**
- **Theoretical model**
- Experimental, alternative, or performance models

IV. Considerations When Writing

- **Do not discriminate against individuals**
- **Use appropriate research terminology**
- **Employ a point of view consistent with quantitative and qualitative approaches**
- **Balance research and content**
  Interconnect parts of the study

Overhead: "How to Write Good"—Frank L. Visco and Peter Adams

Overhead: "A Dictionary of Useful Research Phrases"—C. D. Graham

Overhead: "On Writing a Pome"—attributed to Phil Byrum

V. General Standards for Evaluating Research

- **Does it meet publication standards?**

- **Will it be useful in our school?**
- **Will it advance policy discussions?**
- **Will it add scholarly knowledge about a topic or research problem?**
- **Will it help some pressing educational problem?**

A. Quantitative Shortcomings

- **Validity and reliability of data-gathering procedures**
- **Inappropriate or problems in research designs**
- **Limitations of study not stated**
- **Inappropriate sampling**
- **Results of analysis not clearly reported**
- **Inappropriate methods to analyze data**
- **Unclear writing**
- **Assumptions not clearly stated**

- **Data-gathering methods not clearly described**

B. Qualitative Shortcomings

- **Weak links to philosophical ideas behind the research**
- **Lack of rigorous data analysis**
- **Lack of advocacy for the participants**
- Many of the others listed under "A" above

[The checklists on pp. 307-308 of Creswell are very well done.]

Note: Creswell uses APA style version 4, but version 5 is now the standard.

Appendage:

Suggested Guidelines for Assessing Qualitative Research at Biola University

The idea of establishing these guidelines emerged from discussions by the Biola University discussion group on qualitative research. The discussion group--composed of faculty from Talbot Theological Seminary (Christian education), the School if Intercultural Studies, Rosemead School of Psychology, and the School of Arts and Sciences (education)--asked Judith Lingenfelter and Donald Ratcliff to create the initial draft, from their breadth of experience and related study of qualitative research. Additional input was provided by Kevin Lawson (chair of the discussion group). The initial group discussion and the writing of these guidelines, were significantly influenced by criteria developed by Clive Seale (1999), which itself was an adaptation of a document by the British Sociological Association Medical Sociology Group (1996).

The following guidelines are suggested for use in evaluating qualitative research dissertations across the schools of Biola University. In no sense are they mandated criteria, but rather aspects to consider in the assessment of this variety of research.

1. How does the research problem fit into the overall knowledge base of the school or department in which it is being written? Do the hypotheses or sub-questions use criteria

that involve sense experience and can in some way be recorded on paper and/or other media? Are discussions of changes and definitions of key terms included?

2. Does the author sufficiently disclose relevant personal background and his/her perspectives of participants and context?

3. To what degree is the role and/or level of participation by the researcher described? There should be an affirmation of openness to the data regardless of role, and consideration of differences between the offered role and the taken role.

4. Is the research literature cited relevant to the research problem?

5. Do the methods fit the context, participants, and questions? Discuss changes in methods if the initial plan is not appropriate, with an adequate rationale and evidence for revisions.

6. Is the selection of participants described and justified using accepted conventions, including possible modification/s of the initial plan?

7. Is the research setting described in detail, including physical location, surrounding community, relevant history, routines, and methods of initial and ongoing access by the researcher?

8. Is a systematic approach taken in data collection? Data and notes related to decision-making are to be available for external audit and verification.

9. Is a systematic approach taken in data analysis, including clear description of the genesis and meanings of categories, concepts and themes? Procedures used in data analysis should be related to formal analytic methods such as constant comparison.

10. Are decisions regarding which data to analyze and which data to ignore made on the basis of the research questions and priorities of participants, rather than researcher biases?

11. Are discrepant or conflicting results reported and supported, the result of an active search for negative cases?

12. Does the presentation include the full range of evidence, including the variation of perspectives of participants as well as views they hold in common?

13. Are validity-related procedures such as triangulation and participant feedback adequately utilized and described, with the goal of correcting, clarifying, and extending research analysis and conclusions?

14. Are conclusions in the presentation supported by primary evidence from the data? The data are to be clearly distinguished from interpretation.

15. Are conclusions and applications coherent and plausible?

16. Are the limitations of the study identified? Conclusions and applications should be topic-focused, and the potential for error recognized.

17. Have all relevant ethical guidelines—such as confidentiality, consequences to participants, etc.--been followed during the course of research? Procedures and relationships are to be consistent with a biblical/Christian world view.

18. To what extent does the research reflect a passion about the topic and a caring for the people studied? Details and conclusions should reflect participants' words and ways of thinking, as understood and verified by a compassionate and open researcher.

6-27-02

Protocol Form for Conducting a Project for Educational Research (ASED 503)
Adapted from a research methods class protocol used by Rosemead School of Psychology

Date _____

1. Investigator(s):_____

2. Topic of Proposed Research Project:_____

3. Are the participants being deceived in any way? If so explain the nature of the deception and why it is being used. (Normally, studies involving deception will not be approved.)

4. Are the study participants minor children (under age 18)? If so, how is parental consent to be obtained?

What safeguards are built in to allow the minor children to withdraw from participation at any time?

5. Describe the potential risks: physical, psychological, social or other.

Explain how the rights and welfare of the participant will be protected and how the participant will be guarded from the risks enumerated above.

6. How do you plan to debrief the participant?

7. The following information should be part of your proposal:

a. Describe how the nature of the project is going to be presented to participants.

b. List all questionnaires, tests and/or instruments to be used. Attach copies of materials to be used.