

Introduction to Graduate Research



Introduction to the Research Process
and Basic Research Concepts

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Topic Outline

- Purposes of Research
- Ways of Categorizing Research
- The Scientific Approach
- Limitations of the Scientific Approach in the Social Sciences
- Terminology in Research
- Typical Stages in a Research Study
- Sources of Potentially Researchable Problems



General purposes of research

- make comparisons
- examine relationships
- describe some phenomenon
- make predictions



Research results can be used to:

- formulate or revise theories
- create policy
- establish the need for a program or service
- support decisions or judgments



Possible uses of research

- informed consumption of research
- grant writing
- accountability
- policy analysis
- discovery and information sharing



Ways of Categorizing Research

- Basic versus Applied
- Quantitative versus Qualitative
- Objective versus Constructivist
- Positivist versus Postpositivist
- Deductive versus Inductive



Basic versus Applied Research

- Basic research is generally intended to create or support theory
 - not to solve practical problems directly
 - laboratory or artificial setting
 - Examples:
 - examination of relationships;
 - use of animals



basic vs. applied – cont'd

- Applied research has the goal of solving practical problems
 - “field setting,”
 - less likely to generalize
 - Examples:
 - Evaluations
 - Applications of new methods



Quantitative versus Qualitative Research

- Two approaches to conducting research
 - they differ in type and method of data, research questions, underlying philosophical orientations
- Mutually exclusive and incompatible?



Quantitative research

- Characterized by use of numeric data
- Typically answers questions of the form:
 - In what ways do groups A and B differ?
 - Is there a relationship among a given set of variables?
 - Have groups A and B changed across time?
 - Was the treatment (or intervention) more effective for one group than the other?
 - Does variable X predict outcome Y?
- Uses statistical analysis to answer research questions



Qualitative research

- Words, descriptions of behaviors, descriptions of visual images, etc.
- Generally answers questions of the form:
 - What are the characteristics, perceptions, behaviors?
 - Why do people behave in a certain way?
 - How do they understand a particular event or phenomenon?
- Uses analysis of themes and patterns in the data to answer research questions

Quantitative and Qualitative Research: Contradictory or Complementary?

Quantitative – attempts to understand the breadth and characteristics of the subject of interest

Variable	1	2	3	4	5
1) Positive experiences	-	-0.34*	.331*	.325*	.563***
2) Negative experiences		-	0.07	-0.025	-0.006
3) Understanding			-	.6***	.462***
4) Field experience support				-	.778***
5) Assignment assistance					-

Note. *p<.05, **p<.01, ***p<.001

Source Sebald, Pierce, Larkins, Finnerty & Alabdulwahab (2014).



Qualitative – attempts to understand the depth and meaning of the subject of interest



Objective versus Constructivist

- Represent different ways of viewing reality with implications for how one designs research
- Objective reality
 - Independent of individuals
- Constructed reality
 - How individuals perceive it



Positivism versus Postpositivism

- Positivists (in theory) adhere to a strictly objective view of reality
 - Scientific knowledge
 - Quantitative research
- Postpositivists
 - Constructed differently by different individuals
 - Qualitative research



Inductive versus Deductive Reasoning

- Represent two different approaches to gaining knowledge based on how one draws inferences



Deductive reasoning

- A process - moving from general knowledge/principles to specific conclusions
- Valid to the extent that the general principles or “premises” are true
- Characteristic of quantitative research



Inductive reasoning

- Specific facts to general conclusions
- Involves direct observation
- “Perfect induction” assumes you have access to all facts
- “Imperfect induction” - based on a sample



inductive vs. deductive – cont'd

- While some may suggest inductive reasoning is characteristic only of qualitative research, in truth, quantitative research applies elements of both deductive and inductive reasoning




The Scientific Approach (aka the Scientific Method)

- Both inductive and deductive reasoning
- Two-part process:
 - Moving inductively from observations to state general hypotheses
 - Proceeding deductively from testing the hypotheses to drawing specific conclusions
- Considered the “traditional” process of conducting research



The Role of Theory in Research

- Theory: a systematic view of phenomena based on specified relations among variables
- Organizes findings into a framework



Limitations of the scientific approach in the social sciences

- Complexity of Human Behavior
- Difficulties in Control
- Difficulties in Observation and Measurement
- Difficulties in Replication



Terminology in Research

- Construct
- Constitutive or Theoretical Definition
- Operational Definition



Examples – Define:

“healthy”
“motivation”



terminology – cont'd

- Subject/Participant
- Types of Variables
 - Independent
 - Dependent
- Kinds of variables
 - Categorical (including dichotomous)
 - Continuous



Typical Stages in a Research Study

- Identifying a problem to address
- Reviewing the literature
- Designing the study
- Collecting the data
- Analyzing the data
- Interpreting and reporting results
- Drawing conclusions



Identifying a problem to address

- The problem constitutes the topic of your study
- Should be of sufficient importance to warrant an investigation
- Should be “researchable”
- In general should be an issue for which the answer is not already known
 - a possible exception might be in a program evaluation where the success of similar programs has been established elsewhere



Reviewing the Literature

- In general provides additional information to help in the refinement of the problem as well as in the planning, design, implementation, and interpretation of the study



Designing the study

- The design of the study includes all components necessary to address the problem including:
 - Identification of participants or subjects
 - The general research approach or design
 - Methods for data collection
 - Selection of data analysis procedures



Analyzing and Reporting Results

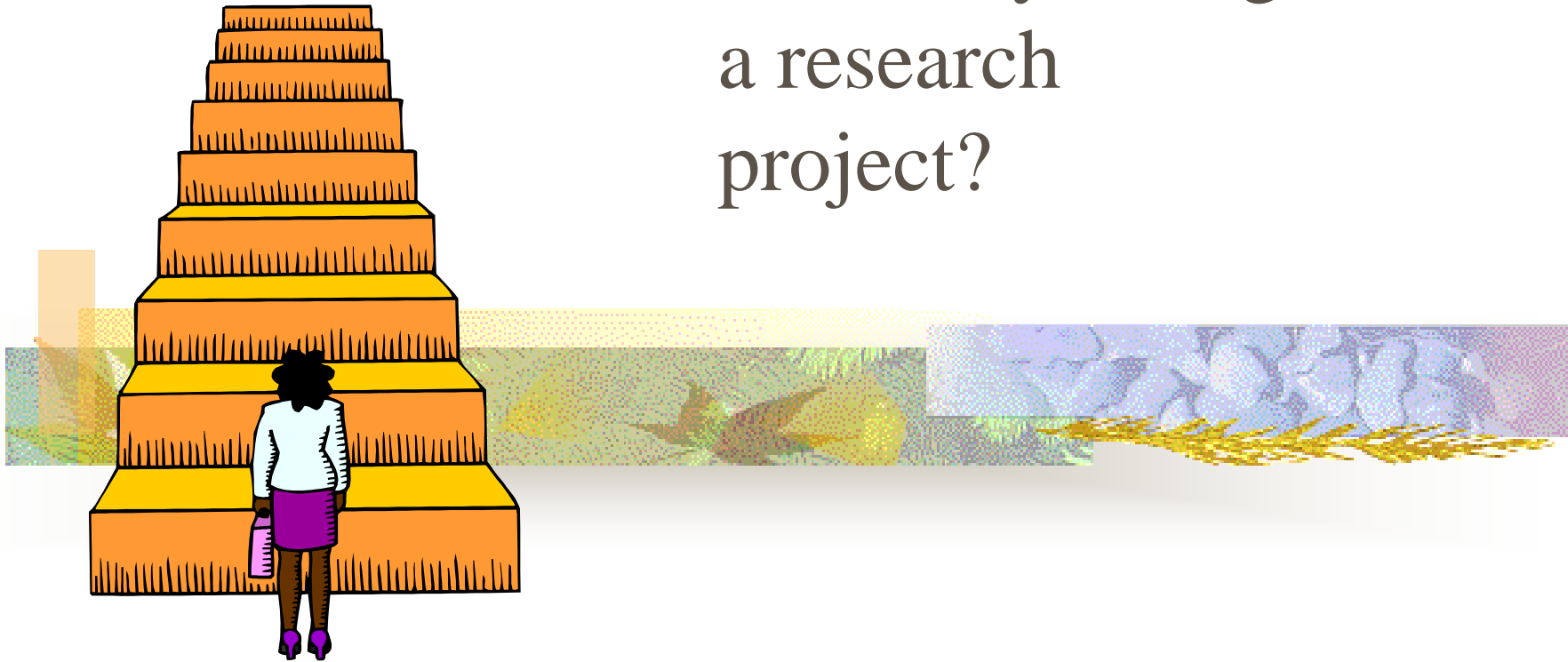
- Assessment of potential problems with the data, measures, or statistical procedures
- Use of appropriate analytical procedures to answer research questions
- Reporting of results in both graphical and narrative form



Interpreting the Results

- Linking of results to theory and previous research
 - to what extent are your results consistent with your expectations as well as with prior research?
- Drawing conclusions about the potential implications of your findings
- Identification of limitations or problems within the study

How do you begin
a research
project?





Typical Stages in a Research Study

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Sources of Potentially Researchable Problems



The review of literature as source of problems

- Limitations/weaknesses in previous research
- Untested theories
- “Gaps” in our knowledge
- Logical next steps in research



Experience and observation

- Problems encountered on the job
- Observed phenomena
- Mandated by your supervisor or organization

Resources: The Research Consulting Lab (RCL)

Faculty x Critical E x Session x Calenda x Launch x Program x Syllabus x SRM700 x Inbox (2 x ASRM-F x Assessm x ExC SR x Microso x About U x Research x

unco.edu/cebs/research-consulting-lab/

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Research Consulting Lab

The **Applied Statistic and Research Methods (ASRM)** Research Consulting Lab is committed to providing UNC faculty, staff, and students with free consultation on research and survey design, data collection and management, statistical analysis, and evaluation. Research consultants have extensive training in applied statistics and research methods, and can offer advice for both quantitative and qualitative research. The Research Consulting Lab also strives to provide appropriate introductory training with common data analysis software.

Supporting Students and Faculty with Disabilities in the Research Consulting Lab

0:00 / 4:08

Consulting Services

Consulting services include advice and training:

- Designing studies and surveys
- Selecting methods of data collection
- Selecting methods of data storage and management
- Selecting and implementing statistical analyses

Research consultants are available on a drop-in basis or by appointment. For assistance with research projects, clients should anticipate approximately 2-4 weeks of interaction with consultants, exact duration dependent on the scale of the project.

Make an Appointment

We are available to make appointments either by email (rcl@unco.edu) or in person at 537 McKee Hall. It is better to see us as you are beginning your research project; we would be glad to help you with your research question and work with you through to the end!

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The RCL: rcl@unco.edu

General Recommendations

- Consultants are there to assist you, not to perform analysis: it is a learning process for you
- Give yourself plenty of time as many sessions may be required.
 - Consultant may need a few days to a week to consider the problem

What to Bring

- Research questions
- For survey research, bring a copy of your questionnaire
- Description of variables
 - Conceptual description
 - Operational definition (how they were/will be measured)
- Data file
 - In raw form
 - Excel file is preferred

Planning Your Study

- Research question(s)
 - Too broad
 - Too many
- Research design
 - Participants
 - Procedures
 - Methods
- Appropriate statistical analysis
- Provide suggestion on how to set up your data file (e.g., format, missing data, code book)

After Data Collection

- Data cleaning and management
 - It could be time consuming
- Preliminary analysis
 - Descriptive statistics
 - Psychometrics (e.g., reliability and factor analysis)
- Statistical analysis
 - Appointments may be needed

The RCL: rcl@unco.edu

Resources

SAS Links

- SAS Products and Solutions
- SAS Product documentation

SPSS Links:

- UCLA SPSS help
- IBM SPSS brochure

General Statistics:

- UCLA research consulting help

NVivo Links:

- NVivo resources for teachers
- NVivo demonstration
- NVivo 10 help
- NVivo 10 help (International)

R Links:

- R Project for Statistical computing
- R news and tutorials from R bloggers
- R tutorial from Robert Kabacoff
- R search engine
- Google's R guide
- R Wiki Books

Latex Links:

- LaTeX document preparation system
- Help with LaTeX
- LaTeX Quick tutorials
- LaTeX help from Trinity college
- Citation using LaTeX

Alternative Resources

Social Research Lab
Telephone: 970-351-2374

Tutoring

UNC Tutoring Center
Michener Library (L-149)

Math Tutoring Center
Ross 1250

Technology

UNC Information
Management and Technology
Carter 14

Telephone: 970-351-2341

Writing

UNC Writing Center
Ross 1230
Telephone: 970-351-2056

The RCL: rcl@unco.edu

Tutorials and Workshops



Workshops

Lab consultants provide workshops throughout the academic year and during summer semester on various research-and software-related topics. Workshops are free to any UNC faculty, student, or staff.



Video Tutorials

Video tutorials created by the Research Consulting Lab staff on qualitative and statistical software procedures, are posted below. Additional videos will be posted as they become available.

- NVivo Video Tutorial