

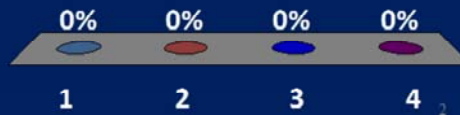
# Identifying the Problem and Developing the Proposal

Chapter 3



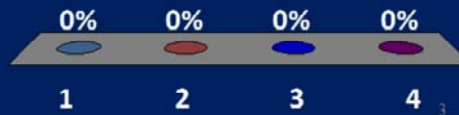
## Goals are:

1. Specific steps  
measuring  
achievement
2. Broad long-term  
aims
3. Quantitative data
4. Process-oriented  
cognitive activities



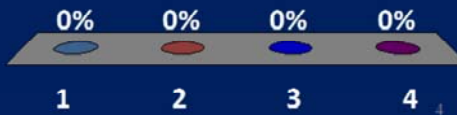
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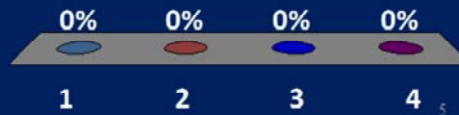
## A hypothesis is:

1. A program indicator
2. Broad long-term aims
3. An educated guess
4. Process-oriented cognitive activities



## Internal validity relates to:

1. A program indicator
2. How well the experimental design allows for accurate results
3. An educated guess
4. How well the results relate to other situations



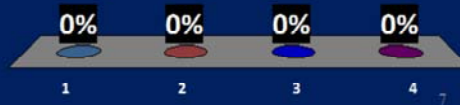
## Nominal data is:

1. Ranked data
2. Categorical data
3. Quantitative data
4. Ranked data with arbitrary 0 point



## Accuracy is:

1. Precision
2. Reliability
3. Ability of an instrument to measure what it should
4. Consistency with which an instrument gives the same result



## The Research Process

The results of any research project are only as good as the data and the methods used to obtain them.

Many decisions have to be made throughout the course of any research project, and it is just not possible to make all of them correctly, or to foresee the need for them at the beginning!



You do not have to know everything when you start out, but through “continuous review and forward planning” you can identify better or new techniques that you can use in your research.

You can change your plans! Assuming they are not too drastic or too close to the end of the project.



## Keep these questions in mind

- What is the main question I am trying to answer?
- What is the main hypothesis I am trying to test?
- If I can test only one hypothesis which one should I choose?
- If I can collect only one sort of information which sort should I collect?



Keeping focused as you develop your proposal and engage in your research is important so that you have can effectively devote your time to one or two research topics.

## Goals

Broad, long-term aims of a program, not necessarily measurable, which are wholly dependent on achievement of several related objectives.



World peace, end hunger, save the world

## Objectives

Specific, measurable statements of intent (steps) which are related to the goals of a program.

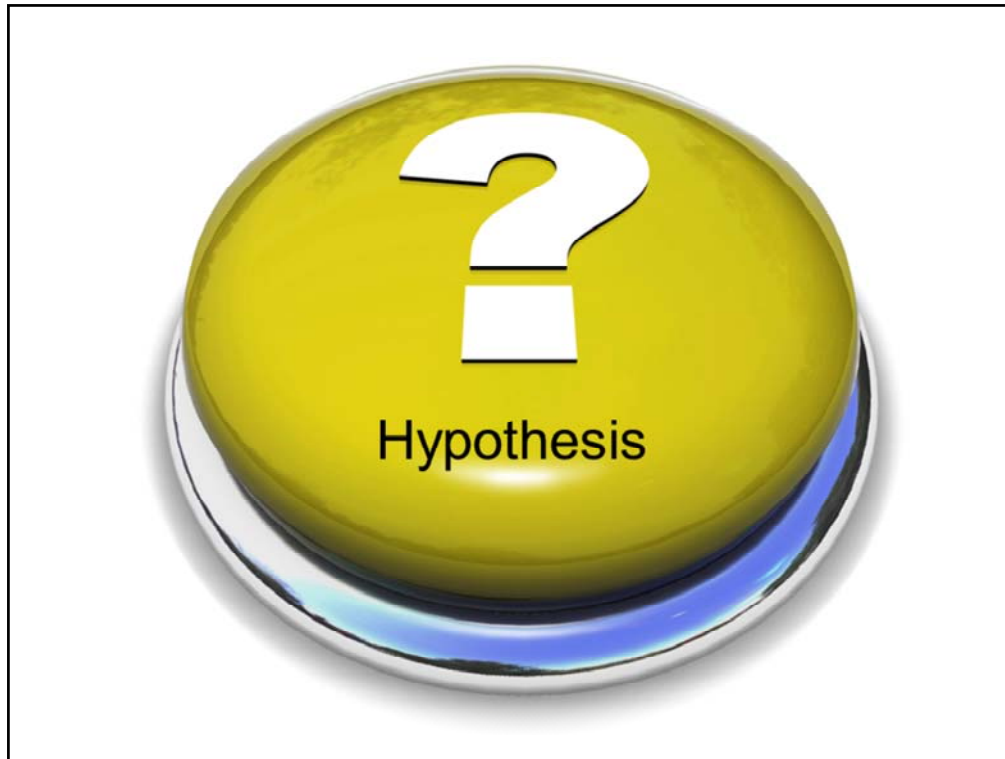


## Components of Measurable Objectives

SMART



Like a recipe



A hypothesis cannot be proven or disproven, it can only be supported or rejected by data. There are an infinitesimal number of variables relating to a specific problem that would prevent it from being proven. As data grows that supports a particular hypothesis, it can become a theory.

In testing a hypothesis, one does not want to set out to deliberately prove a hypothesis because this can lead to bias.

A null hypothesis is usually the opposite of a hypothesis...it poses that there will be no effect (i.e. adding fertilizer to crops will result in no difference in crop yields between fertilized and non-fertilized crops). This is where statistics comes in and is important.

## Functions of a Hypothesis

1. Limits the field of investigation.
2. Sensitizes the researcher to facts and important relationships.
3. Link together related facts and information in an organized form.



Essentially for organization.

The objective and hypothesis are a function of your knowledge on the subject from your lit. review. (i.e. based on observed facts.)

A good hypothesis must be clear, specific, and verifiable.

## Proposal Development (USDA)

<b>WHAT?</b>	Project Name Project Goal General Objectives	<b>WHO?</b>	Management Plan Personnel Narrative Personnel Resumes
<b>WHY?</b>	Introduction Background Analysis of Need Understanding the Problem Project Rationale Institution Involvement	<b>WHEN?</b>	Time and Task Chart
<b>HOW?</b>	Specific Tasks (Technical Approach/Methodology) Evaluation Plan	<b>COST?</b>	Estimate of Project Costs Line Item Budget Budget Form Budget Narrative

**Not all are required for this proposal**

This is an example the framework required for a research proposal for a USDA grant. This is not something that will be asked of you in this class or by the department.

# Outline and Contents of a Research Proposal

1. Literature review
2. Rationale and significance
3. Objectives
4. Materials and Methods



Literature review: put past work in the context of the present day situation as it relates to your project

Rationale and significance: substantiate the need for the project supported by the literature

Objectives: stated specifically and concisely what you intend to accomplish

Materials and Methods: site description, methods, statistics, (expected results, limitations)



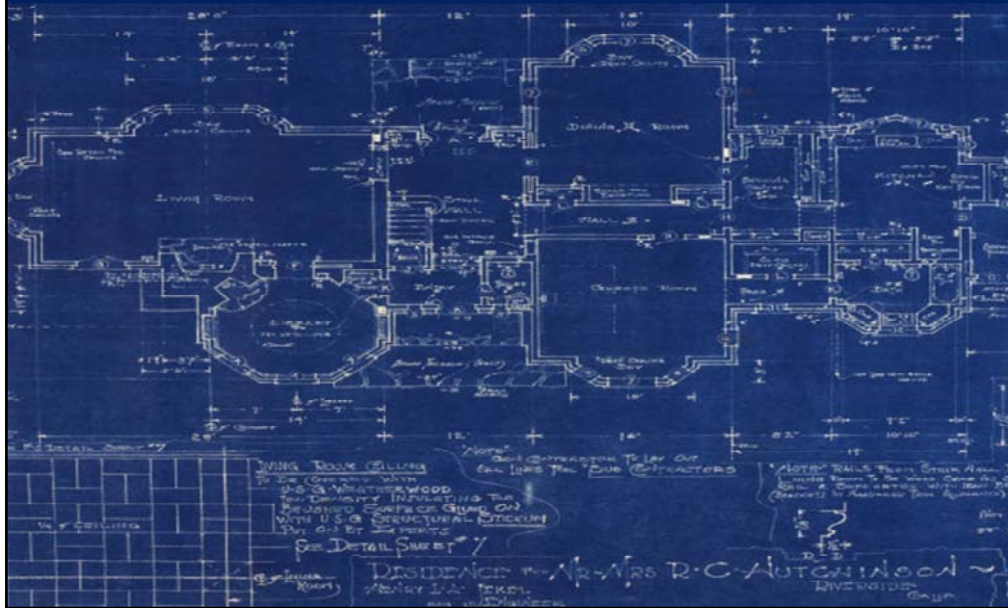
## Attributes of Successful Proposals



Innovative idea  
Up-to-date lit. review  
Well designed experiments  
Focused  
Clear justification

# Research Planning

## Chapter 5



## Research Planning

- Universality
- Replication
- Control
- Measurement



Universality: project could be carried out by any competent individual

Replication: someone else should be able to replicate what you did and get the same values (this is where stating your materials and methods used is important)

Control: control all variables, except the one(s) you are studying....repeat under identical conditions

Measurement: should have measurable values

# Quantitative vs. Qualitative Research

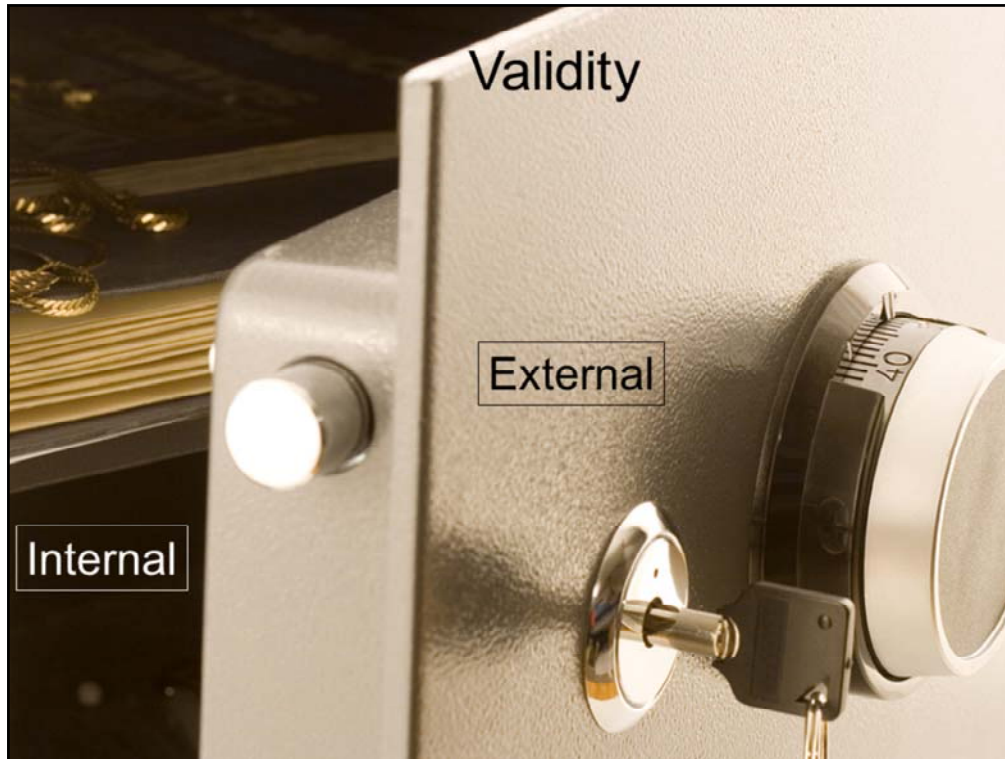
Table 5.1 ■ Distinguishing characteristics of quantitative and qualitative approaches

<i>Question</i>	<i>Quantitative</i>	<i>Qualitative</i>
What is the purpose of the research?	<ul style="list-style-type: none"> <li>• To explain and predict</li> <li>• To confirm and validate</li> <li>• To test theory</li> </ul>	<ul style="list-style-type: none"> <li>• To describe and explain</li> <li>• To explore and interpret</li> <li>• To build theory</li> </ul>
What is the nature of the research process?	<ul style="list-style-type: none"> <li>• Focused</li> <li>• Known variables</li> <li>• Established guidelines</li> <li>• Static design</li> <li>• Context-free</li> <li>• Detached view</li> </ul>	<ul style="list-style-type: none"> <li>• Holistic</li> <li>• Unknown variables</li> <li>• Flexible guidelines</li> <li>• Emergent design</li> <li>• Context-bound</li> <li>• Personal view</li> </ul>
What are the methods of data collection?	<ul style="list-style-type: none"> <li>• Representative, large sample</li> <li>• Standardized instruments</li> </ul>	<ul style="list-style-type: none"> <li>• Informative, small sample</li> <li>• Observations, interviews</li> </ul>
What is the form of reasoning used in analysis?	<ul style="list-style-type: none"> <li>• Deductive analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Inductive analysis</li> </ul>
How are the findings communicated?	<ul style="list-style-type: none"> <li>• Numbers</li> <li>• Statistics, aggregated data</li> <li>• Formal voice, scientific style</li> </ul>	<ul style="list-style-type: none"> <li>• Words</li> <li>• Narratives, individual quotes</li> <li>• Personal voice, literary style</li> </ul>

Quantitative: answers questions about relationships among measured variables with the purpose of explaining, predicting, and controlling phenomena....usually starts with a specific hypothesis to be tested and selects certain variables to measure...usually ends with confirmation or disconfirmation of hypotheses

Qualitative: answers questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participant's point of view...usually starts with general research questions and collect an extensive amount of data...ends with tentative answers or hypotheses

Example: Effectiveness of a specific teaching practice



Internal: the extent to which its design and the data allow the researcher to draw accurate conclusions within the data (need a controlled laboratory study, a double-blind experiment, unobtrusive measures, multiple data sources)

External: the extent to which its results apply to situations beyond the study itself (need a real-life setting, representative sample, replication in a different context)

## Data Collection

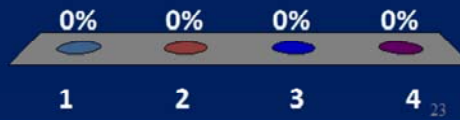
- What data are needed?
- Where are the data located?
- How will the data be secured?
- How will the data be interpreted?



Save data in multiple locations. Save paper records for comparison with data entry.

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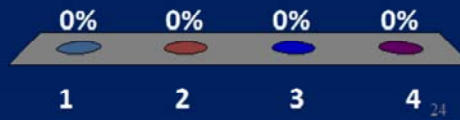
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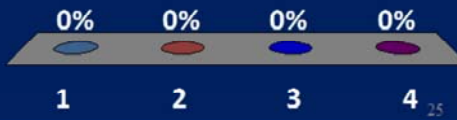


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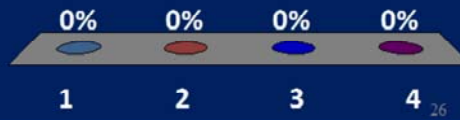
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