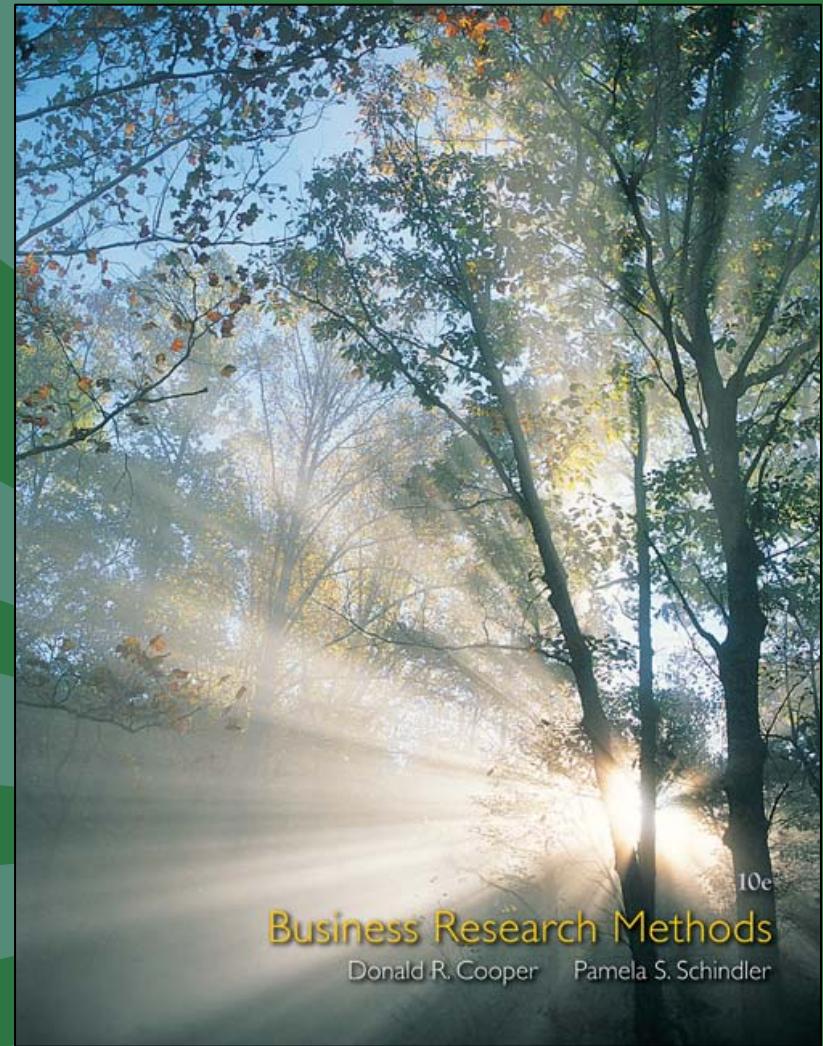


Chapter 1

Research in Business





Learning Objectives

Understand . . .

- What business research is and how it differs from business decision support systems and business intelligence systems.
- Trends affecting business research and the emerging hierarchy of business decision makers.
- The distinction between good business research and research that falls short of professional quality.
- The nature of the research process.

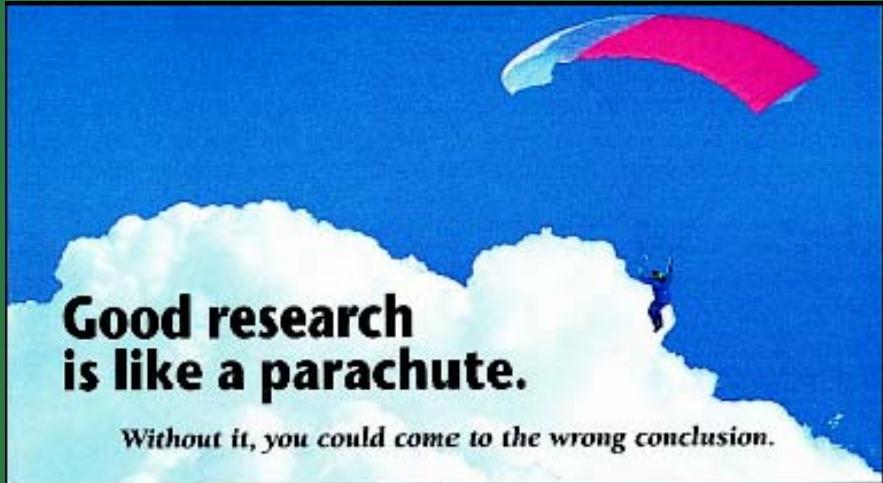
PulsePoint: Research Revelations

23

The percent of firms planning significant hiring who plan to hire highly-educated professionals.

Why Study Business Research?

Business research provides information to guide business decisions



Good research is like a parachute.

Without it, you could come to the wrong conclusion.

With research from JRP, you'll reach the right decision. For more than 40 years, we've worked with ad agencies and corporate clients as partners, designing and fielding projects of all types. See why our seasoned staff of project directors, interviewers, coders and analysts have led so many companies to come to the same conclusion: JRP. Call Paul Fratarioli toll free at 877-JRP-2055 and ask about our full range of services.

109 GRANITE DRIVE, MISHAWAKA, IN 46545-5514
877 JRP-2055 610 565-8840
FAX 610 565-8870 JRPMARKETING@AOL.NET

JRP
MARKETING
RESEARCH SERVICES
INC.

Research Should Help Respond to Change

“Enterprises have long recognized the need to better sense and respond to business change. What’s different today is that ubiquitous access to information and real-time communications have fostered an ‘always on’ business culture where decision making has become a ‘just-in-time process.’”

Business Performance Management Forum

Business Research Defined

- A process of **determining, acquiring, analyzing, synthesizing, and disseminating** relevant business **data, information, and insights** to decision makers in ways that mobilize the organization to take appropriate business **actions** that, in turn, **maximize business performance**

Research Should Reduce Risk

The primary purpose of research is to reduce the level of risk of a marketing decision

**DON'T THROW GOOD MONEY
AT A BAD IDEA.**



Before you launch your new product, see if anyone wants it.

Pretest your new concept—online—with the company that pioneered marketing research on the Internet. Our panel of more than one million consumers from all across the Internet, the largest of its kind, includes exactly the people you want to reach.

Join the Research Revolution!™ Contact the world's most experienced Internet marketing research company for studies online, on time, on target and on budget.

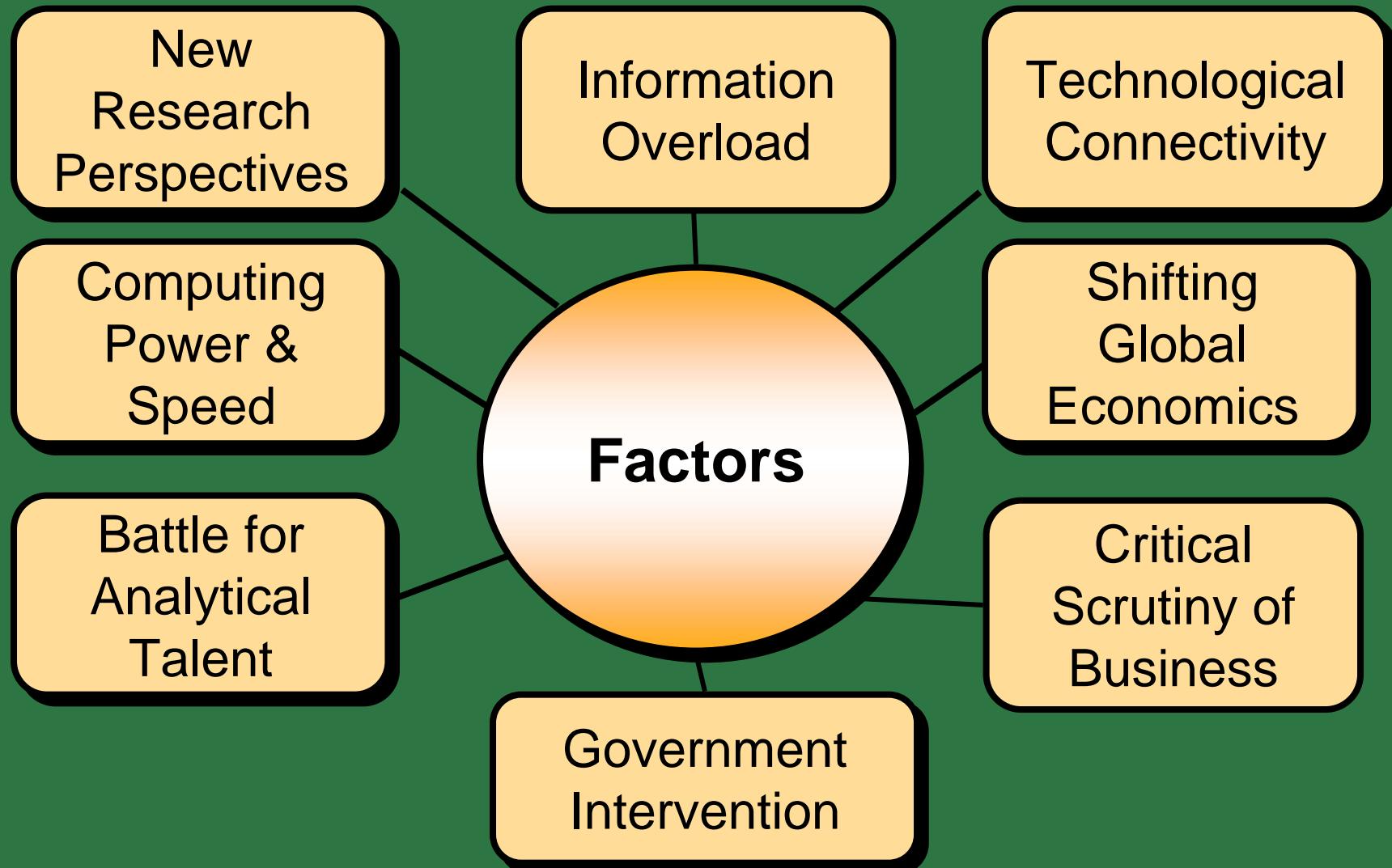
www.greenfield.com 888.291.9997

Greenfield Online

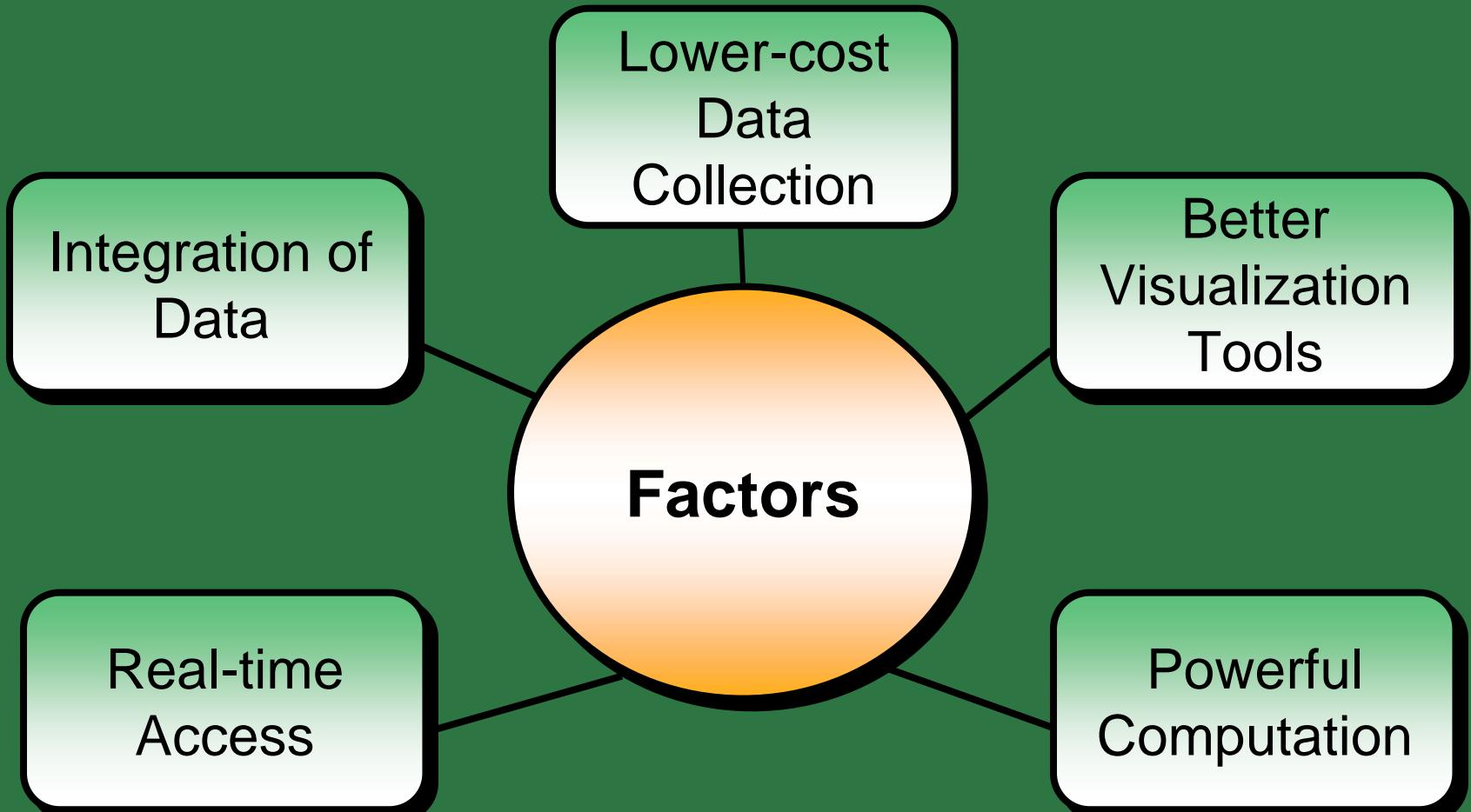
Leading the Research Revolution®



What's Changing in Business that Influences Research



Computing Power and Speed



Business Planning Drives Business Research



Business Decisions and Research

Häagen-Dazs Tactics

- Super premium
- Dozens of flavors
- Small packages
- Signature colors on packaging
- Available in franchise and grocery stores



Information Sources

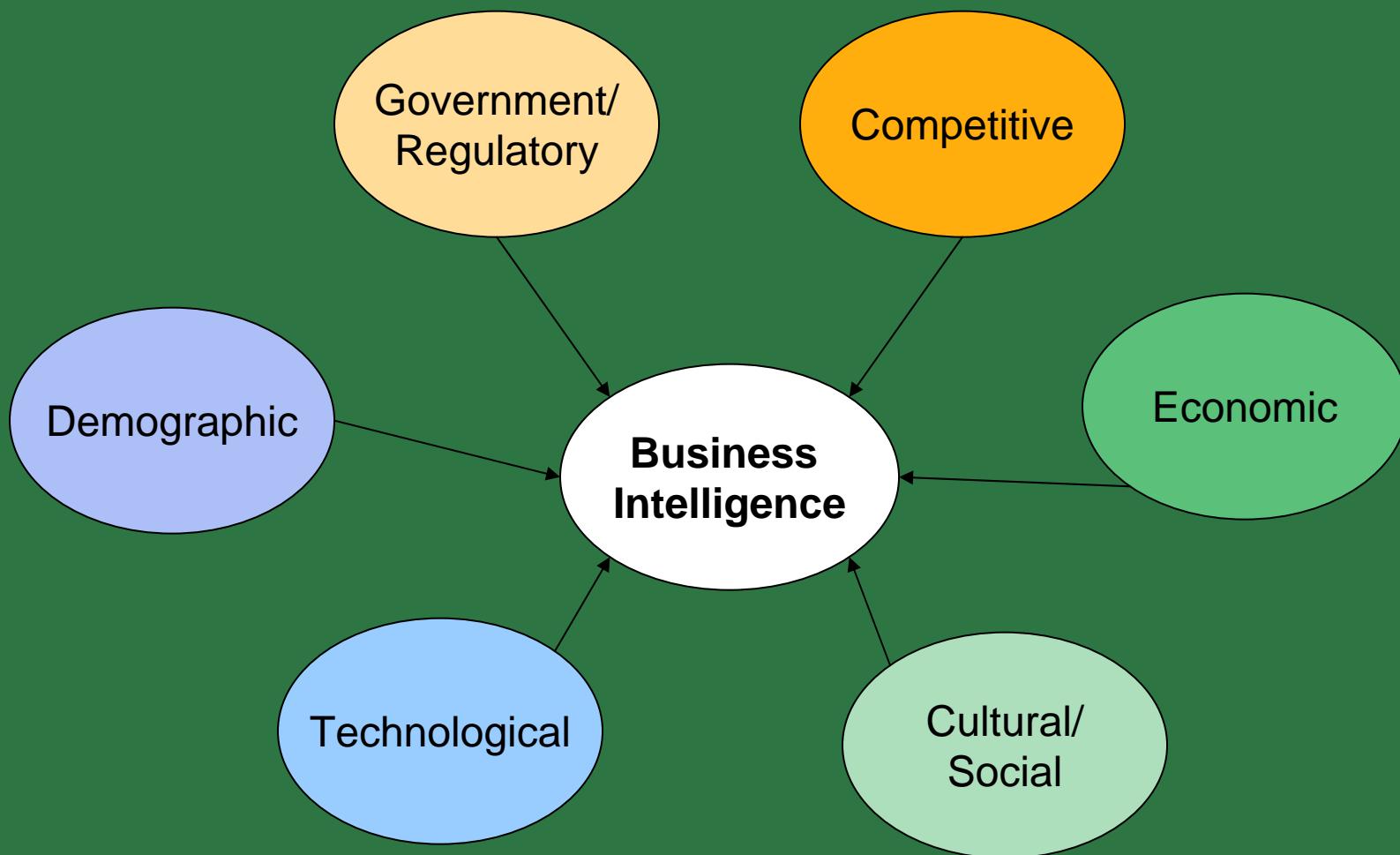
Decision Support Systems

- Numerous elements of data organized for retrieval and use in business decision making
- Stored and retrieved via
 - Intranets
 - Extranets

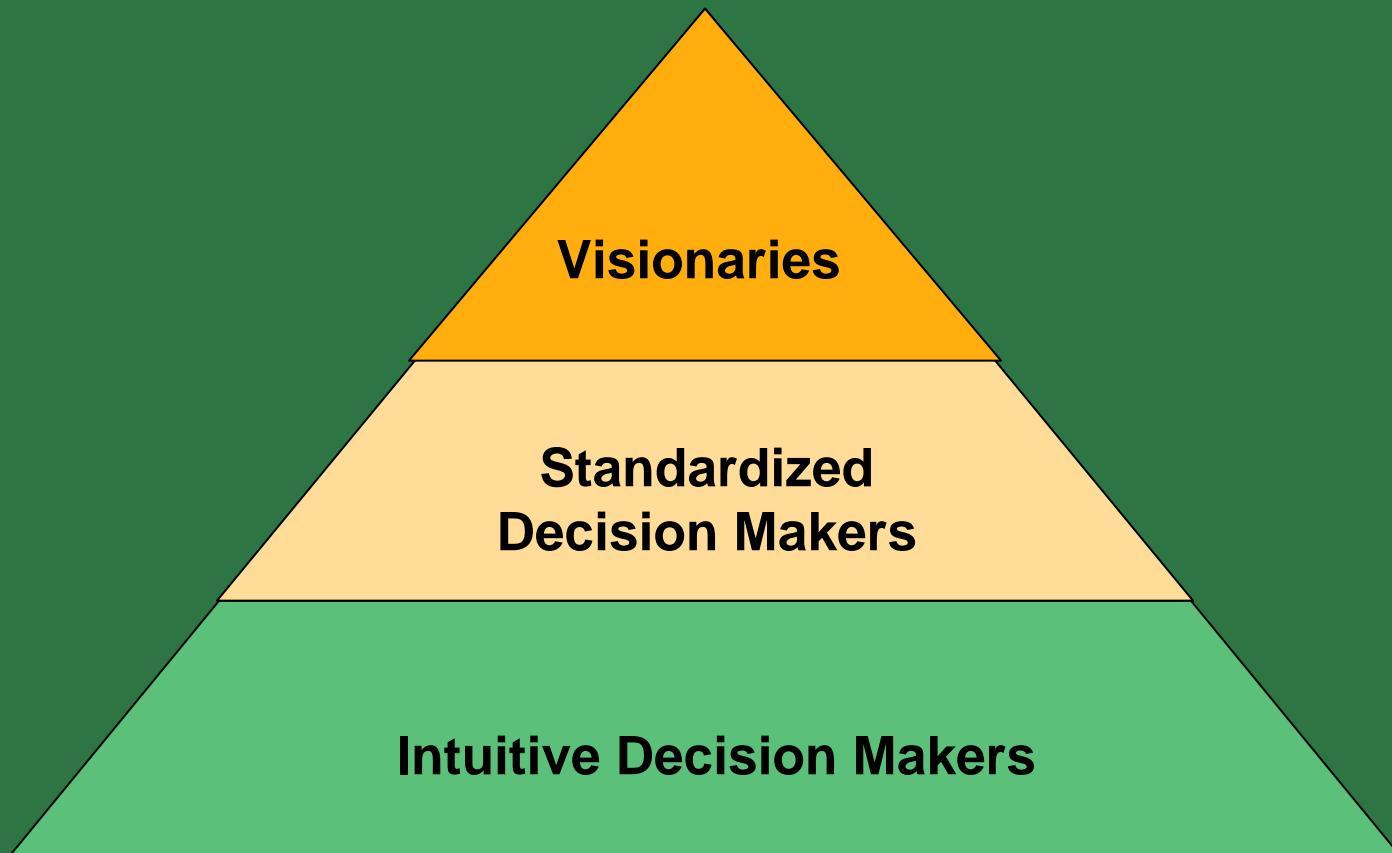
Business Intelligence Systems

- Ongoing information collection
- Focused on events, trends in micro and macro-environments

Sources of Business Intelligence



Hierarchy of Business Decision Makers

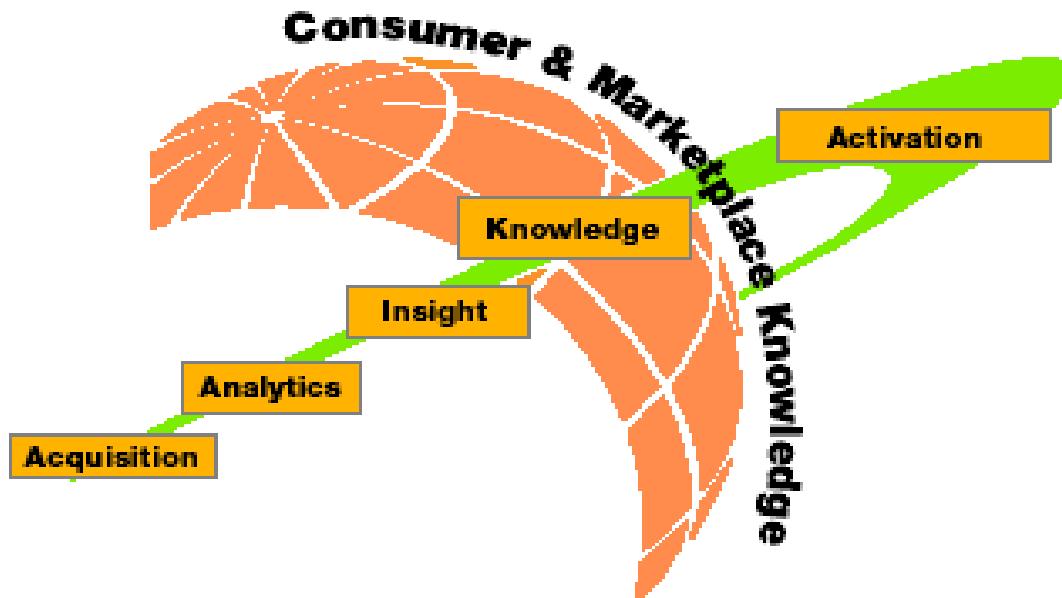


Minute Maid and Business Research

Minute Maid CMK Mission

Our Mission Is To . . .

- Leverage consumer, customer and marketplace knowledge to identify, develop and influence business strategies and tactics that will generate growth in operating income year after year



Eastman Kodak has a world-class research department



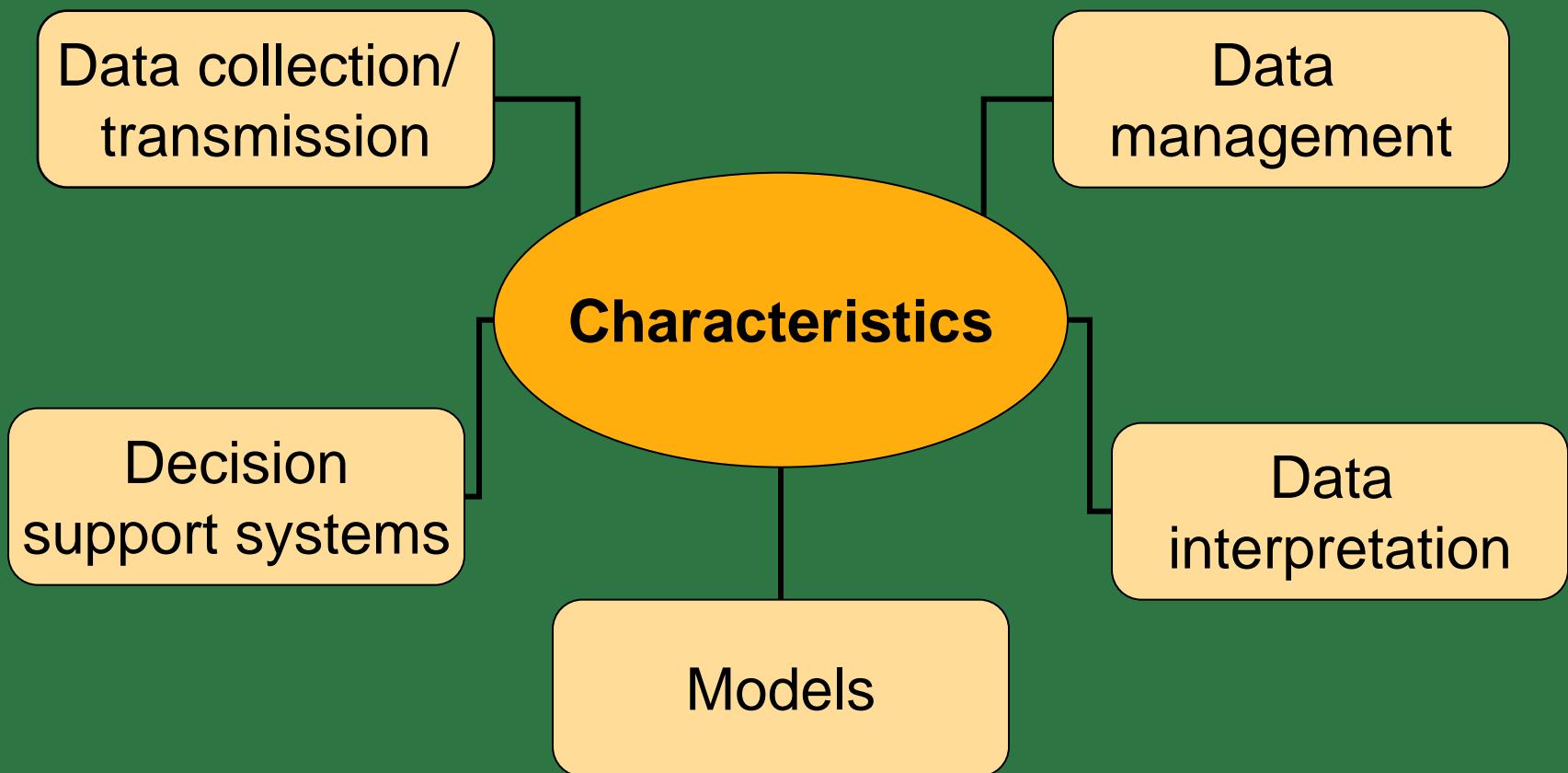


Research May Not Be Necessary

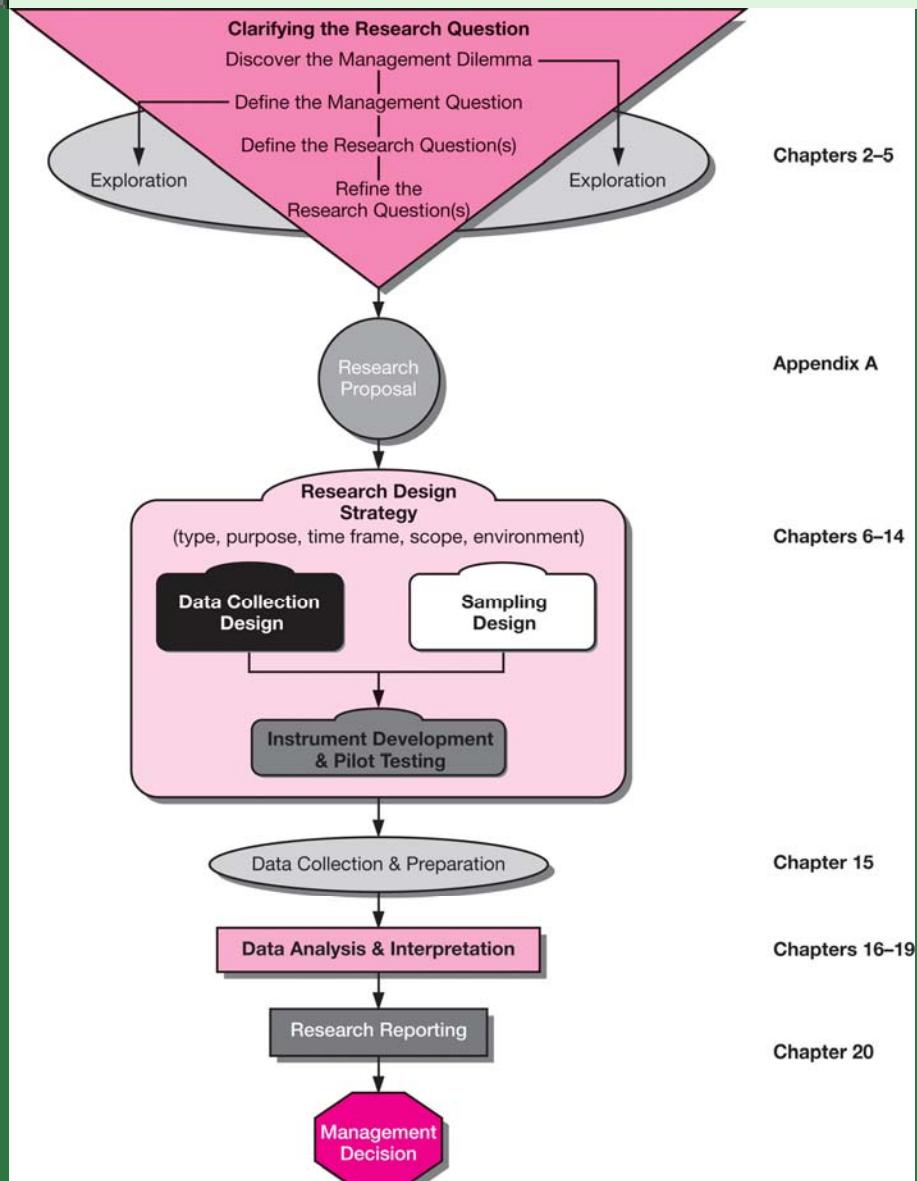
Can It Pass These Tests?

- Can information be applied to a critical decision?
- Will the information improve managerial decision making?
- Are sufficient resources available?

Information Value Chain



The Business Research Process



Characteristics of Good Research

Clearly defined purpose

Detailed research process

Thoroughly planned design

High ethical standards

Limitations addressed

Adequate analysis

Unambiguous presentation

Conclusions justified

Credentials



Two Categories of Research

Applied

Basic (Pure)

Four Types of Studies

Reporting

Descriptive

Explanatory

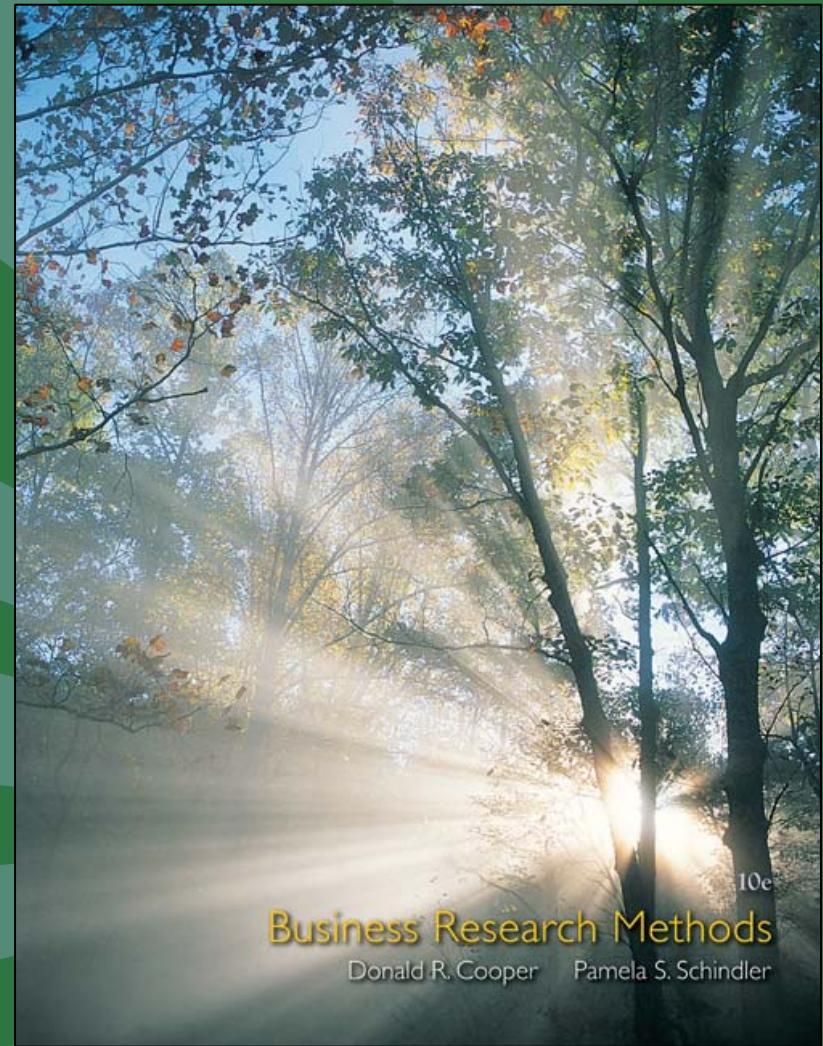
Predictive

Key Terms

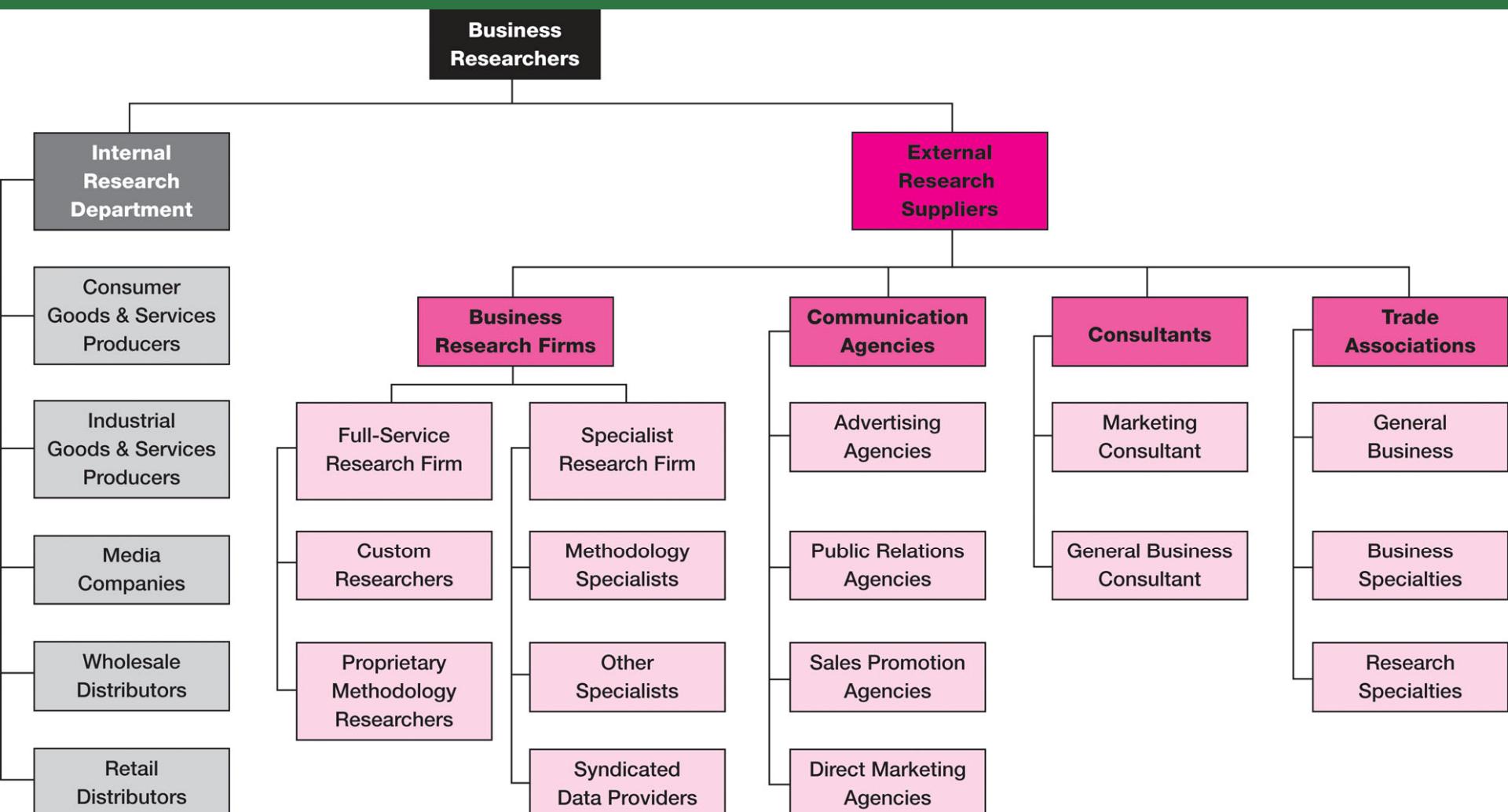
- Applied research
- Business intelligence system (BIS)
- Business research
- Control
- Decision support system
- Descriptive studies
- Explanatory Studies
- Management dilemma
- Predictive studies
- Pure research
- Reporting studies
- Return on Investment (ROI)
- Scientific method
- Strategy
- Tactics

Appendix 1a

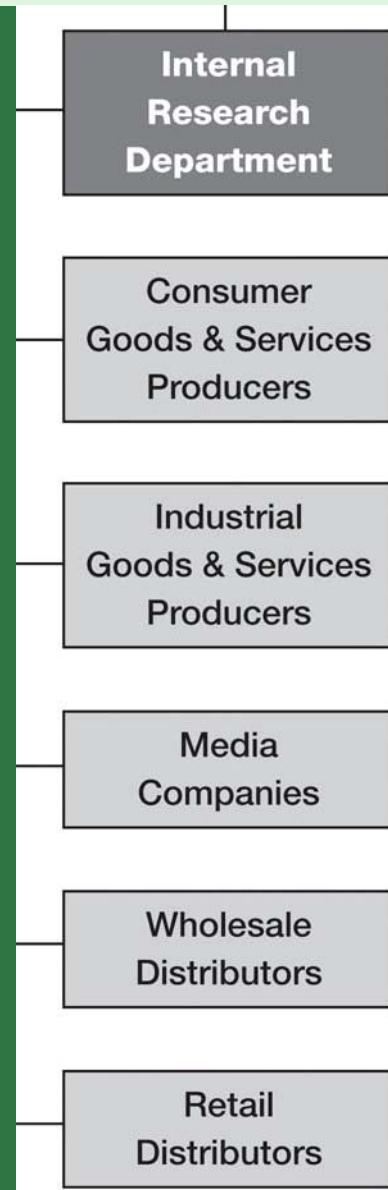
How the Research Industry Works



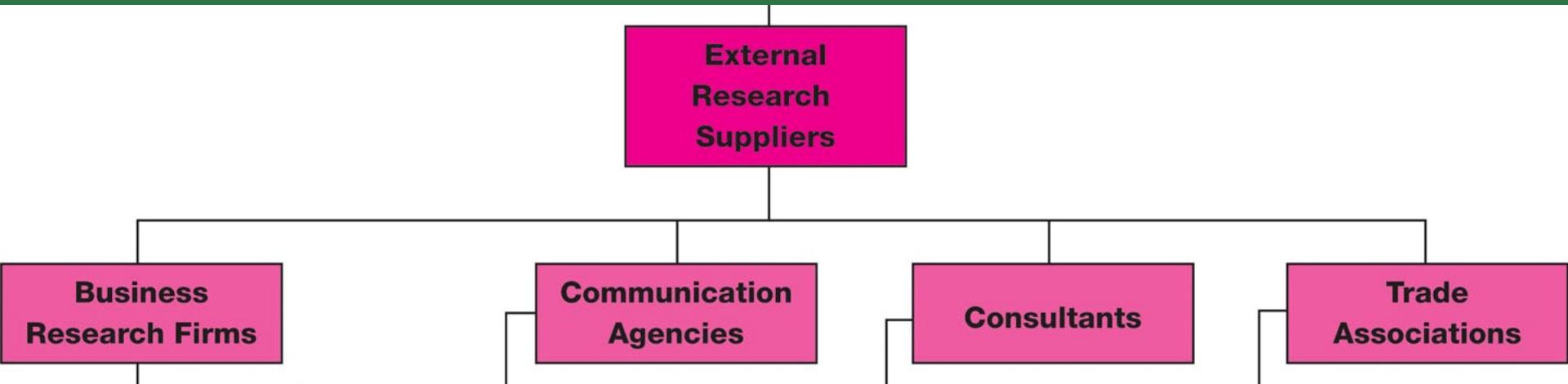
Who Conducts Business Research?



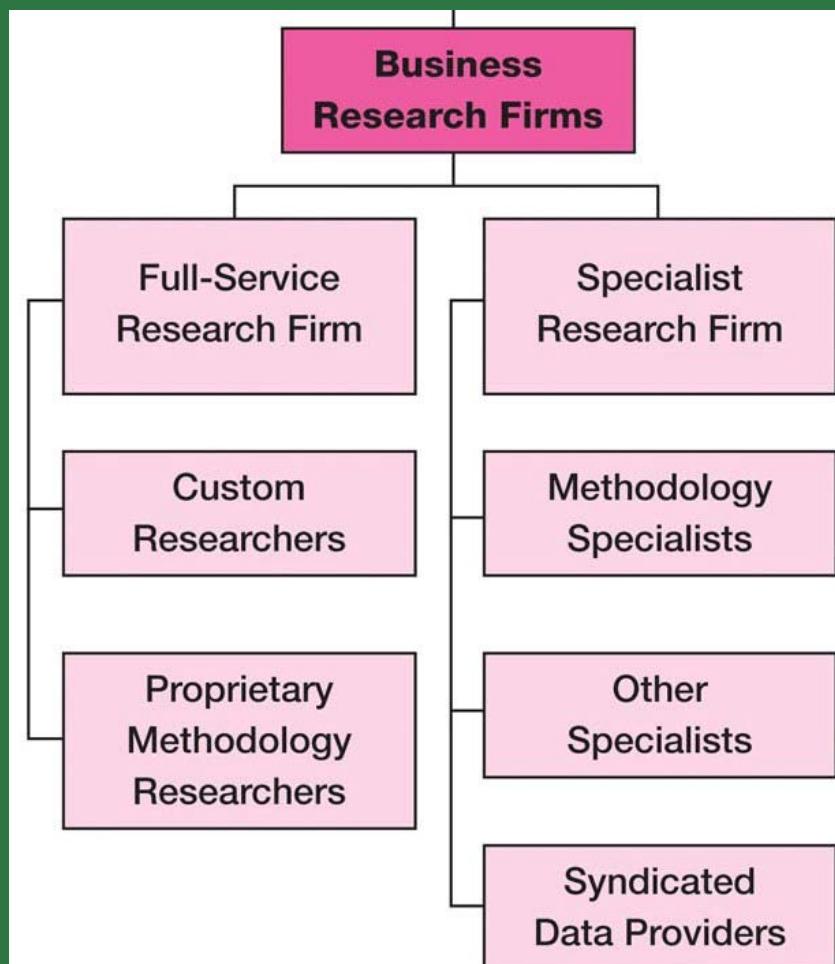
Some Organizations Use Internal Research Sources



Some Organizations Use External Research Sources



Business Research Firms



Proprietary Research



Conceptor® Online Concept Testing

Will your new product idea fly?

We can answer this question and many more with Conceptor®, our industry-leading, Internet-based concept testing system that features:

- In-depth diagnostics to identify problems and improve chances of success.
- Price-sensitivity analysis to help determine optimal pricing.
- Target market refinement to improve advertising media focus.
- Suite of econometric models to predict future sales.

We have over 3,500,000 consumers in our state-of-the-art Internet panels ready to evaluate your new product ideas. Let us help you improve your new product research system.

Call 1-817-242-6166
or visit: www.decisionanalyst.com

Decision Analyst
The global leader in analytical research systems

*Decision Analyst, Inc. uses Internet-based concept testing called **Conceptor** to examine new product concepts*

Syndicated Services

Nielsen Media Research provides audience data for television programs like Court TV



Is this Court TV® viewer:

- (A) the owner of this car
- (B) the salesperson parking this car

Most people would answer B. That's a Court TV® viewer and a lot more opinionated than you'd think. Court viewers are a recognizable lot. And, Discovery and TLC. Which is interesting (but excludes intelligent, compelling stories as well as gripping, suspenseful ones), since that includes the auto industry. For more viewer statistics, call 800-222-1111 or visit www.nielsenmedia.com.

www.court-tv.com
© 1999 Court TV, Inc. All rights reserved.

COURT  **The Investigation Channel**

Some Syndicated Data Providers

- AC Nielsen
- Scarborough
- Millward Brown
- Nielsen Media Research
- Roper ASW
- CSA TMO
- Yahoo!
- ORC International
- DoubleClick
- Nielsen/NetRatings
- Taylor Nelson Sofres Intersearch
- J.D. Power Associates
- MediaMark
- Simmon (SMRB)
- BRMB
- Information Resources Inc.

Specialty Business Research Firms

Methodology

Process

Industry

Participant group

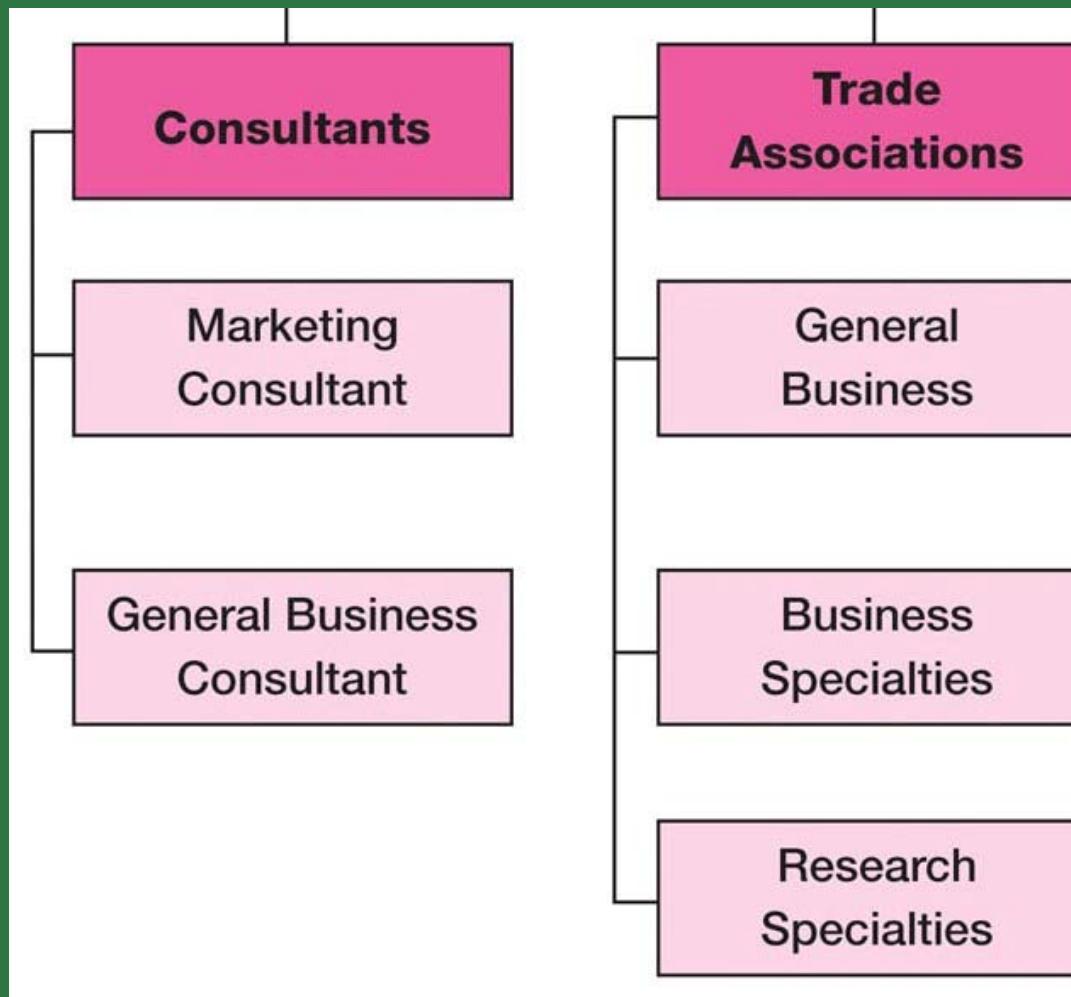
Geographic Region



Communication Agencies



Consultants and Trade Associations



Trade Associations



NHRA

CASRO

MRA

ESOMAR

BRA

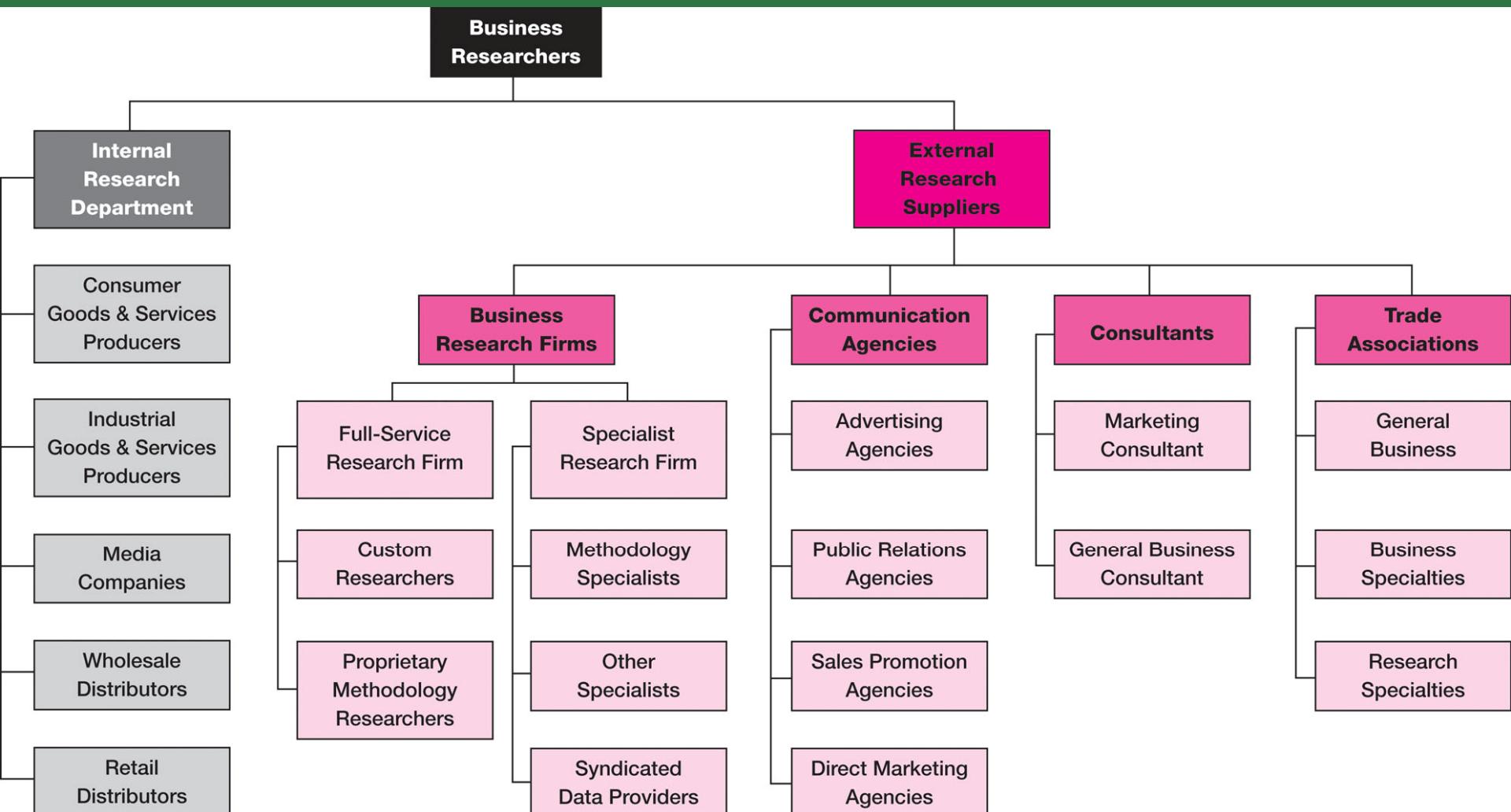
AMA

WAOBP

MPA

NAB

Many Firms Conduct Research

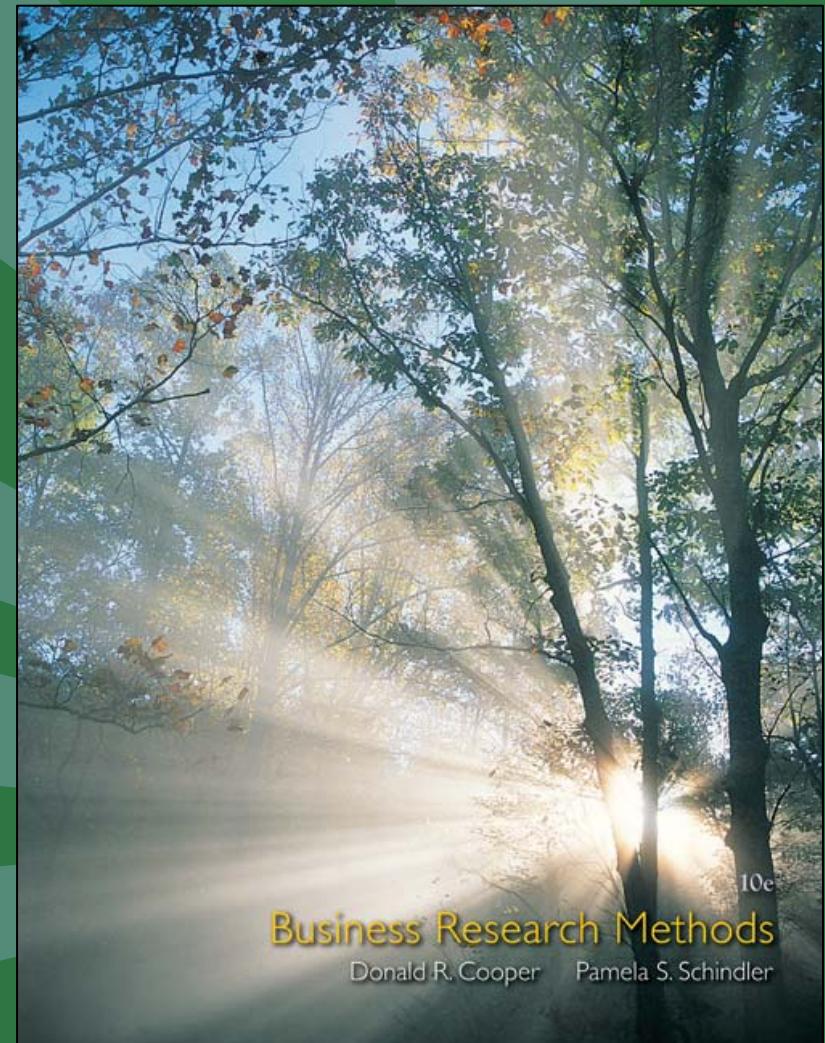


Key Terms

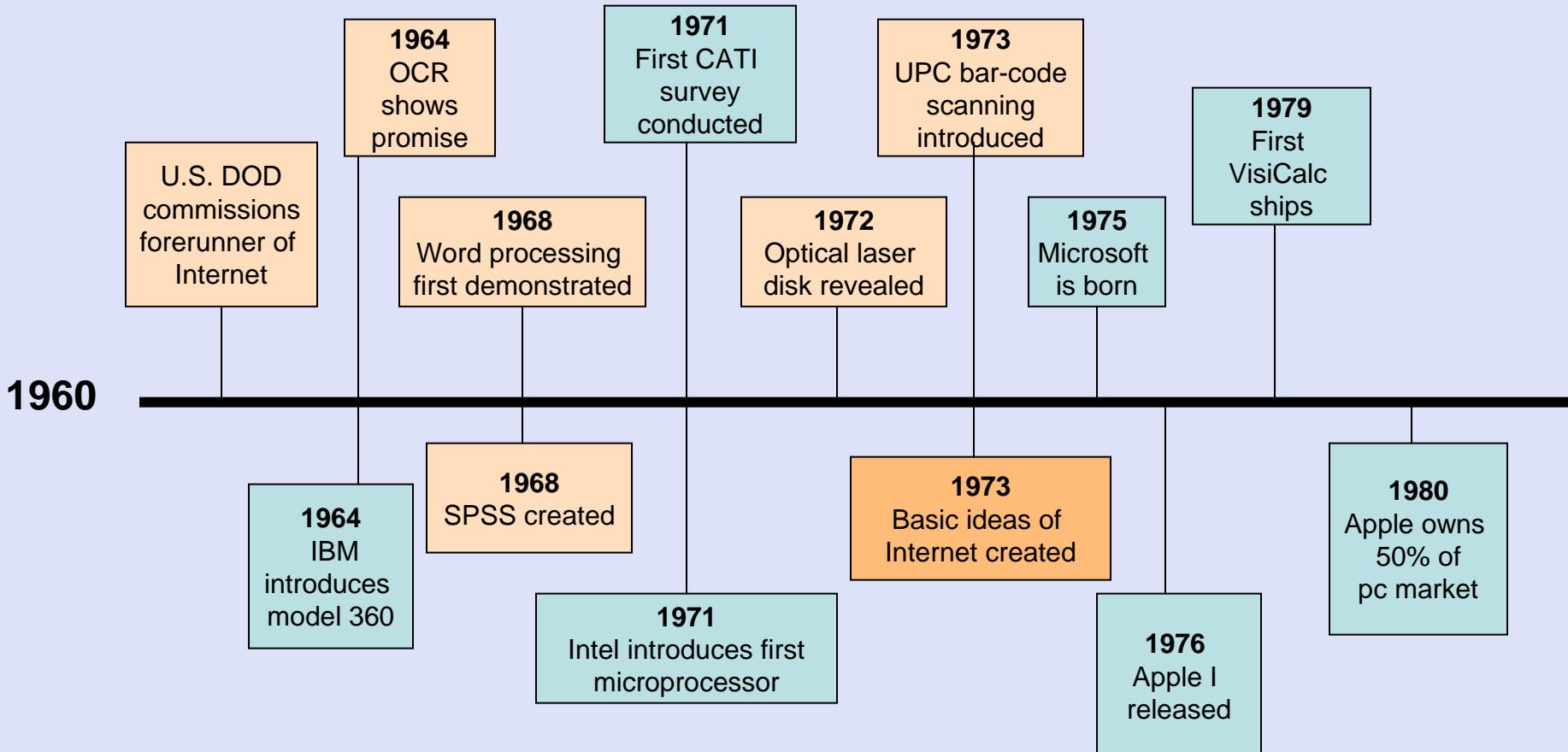
- Custom Researcher
- Full-service researcher
- Specialty researcher
- Syndicated data provider
- Omnibus researcher
- Omnibus study

Chapter 1 Addendum

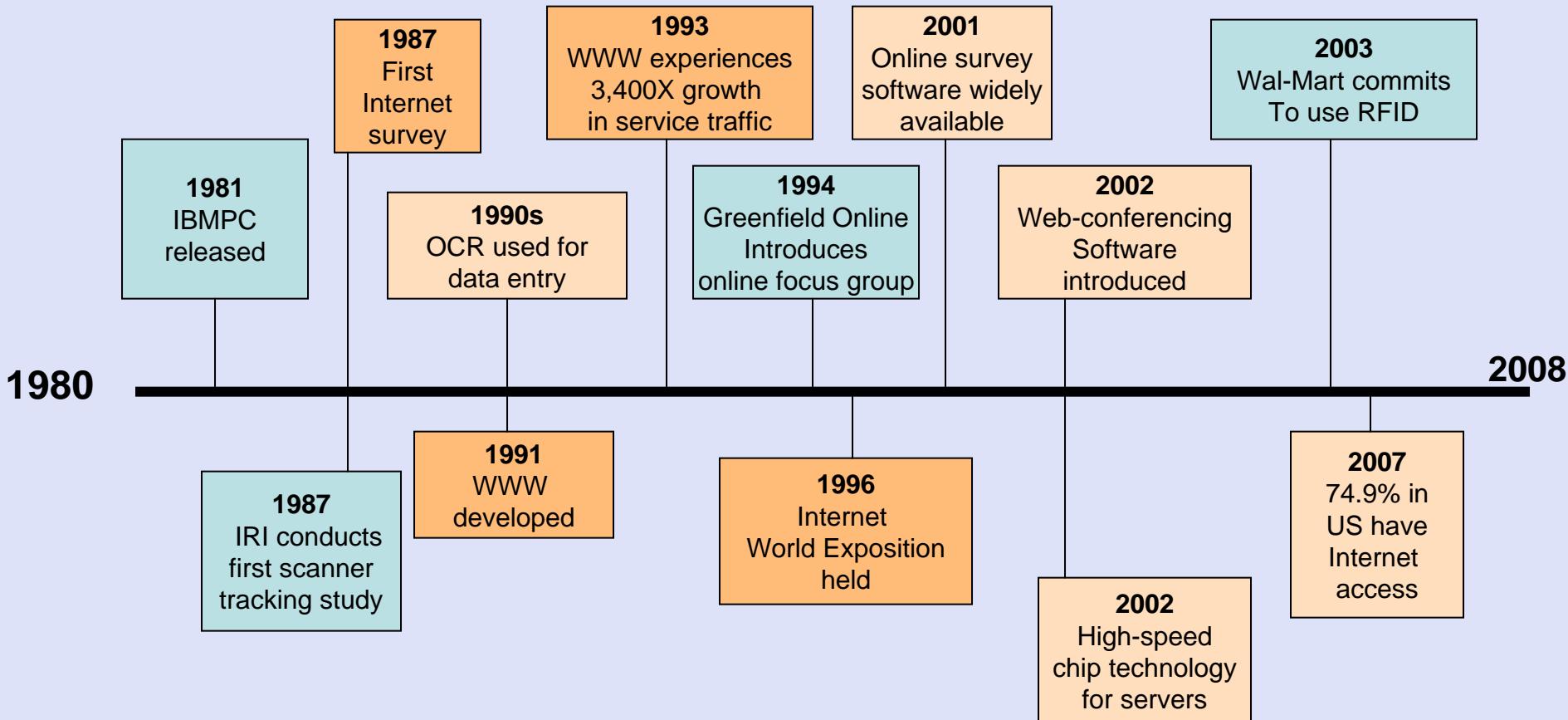
Research Timeline



Information Revolution

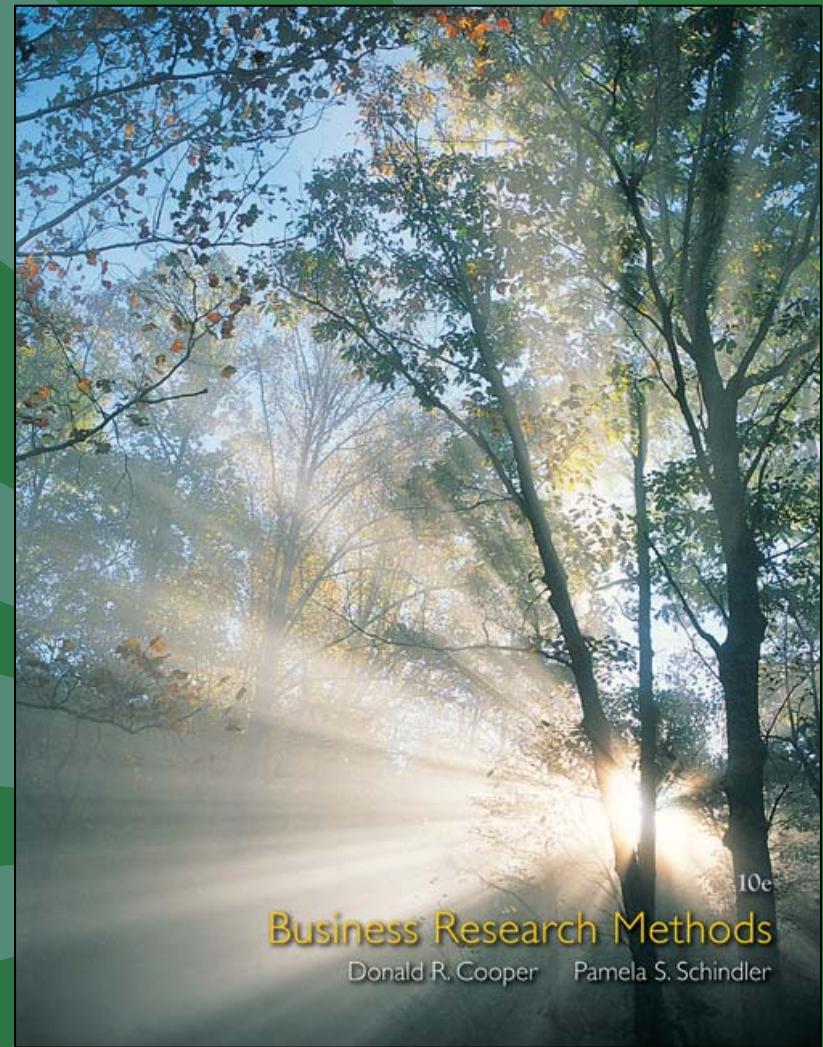


Information Revolution



Chapter 2

Ethics in Business Research





Learning Objectives

Understand . . .

- What issues are covered in research ethics.
- The goal of “no harm” for all research activities and what constitutes no harm for participant, researcher, and research sponsor.

Learning Objectives

Understand . . .

- Differing ethical dilemmas and responsibilities of researchers, sponsors, and research assistants.
- Role of ethical codes of conduct in professional associations.

PulsePoint: Research Revelation

89

The percent of consumer PCs infected with spyware.



Data Collectors Face Responsibilities

“In the new e-frontier, one set of protagonists—merchants—would like to be cowboys, free to roam the range, and continue to share, rent or sell information they’ve collected about citizens without any fences or conditions.”

*Robert E. Litan, director,
AEI-Brookings Joint Center*

Types of Ethical Violations

Violating
disclosure
agreements

Breaking
confidentiality

Padded
invoices

Misrepresenting
results

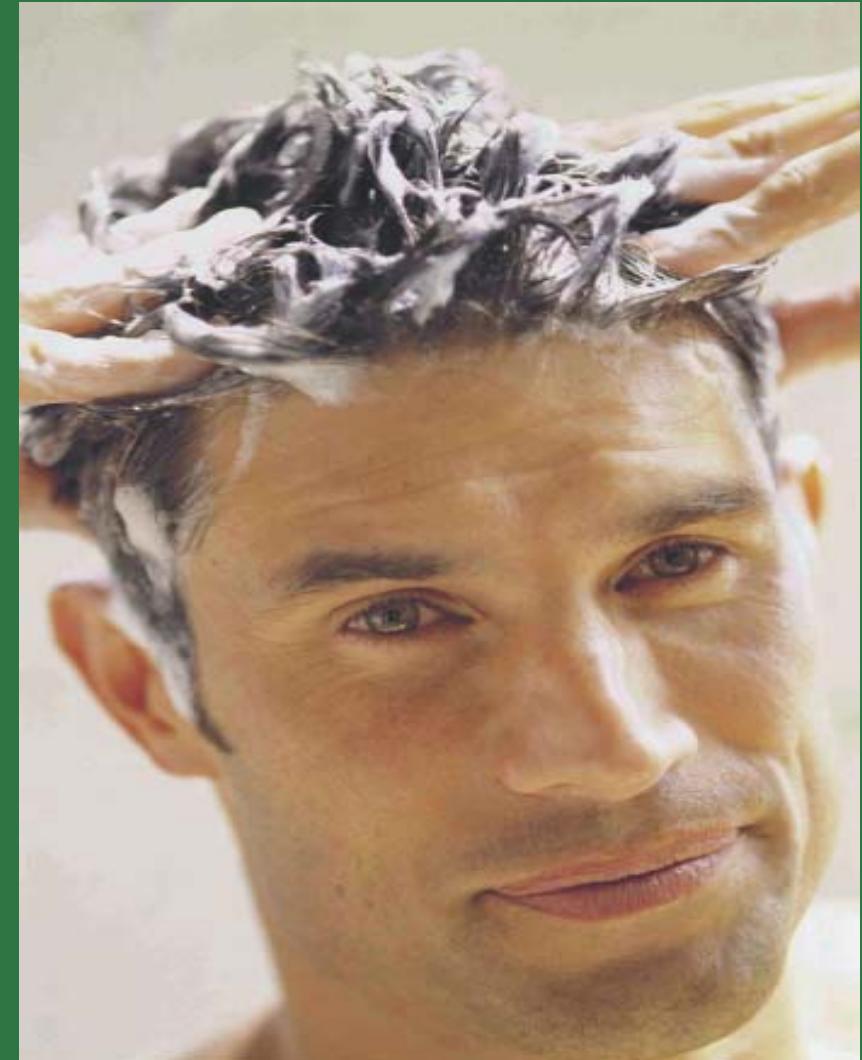
Deceiving
participants

Avoiding
legal liability



Procter & Gamble

- Admits to competitive intelligence gathering
- Contracted BI firm took documents from Unilever trash receptacles
- Out-of-court settlement rumored (and reported) at \$10m



Ethical Approaches



Ethical Approaches

How would you assess the P&G case using the two ethical approaches?

Deontology

Ethical
Relativism



Ethical Codes of Conduct

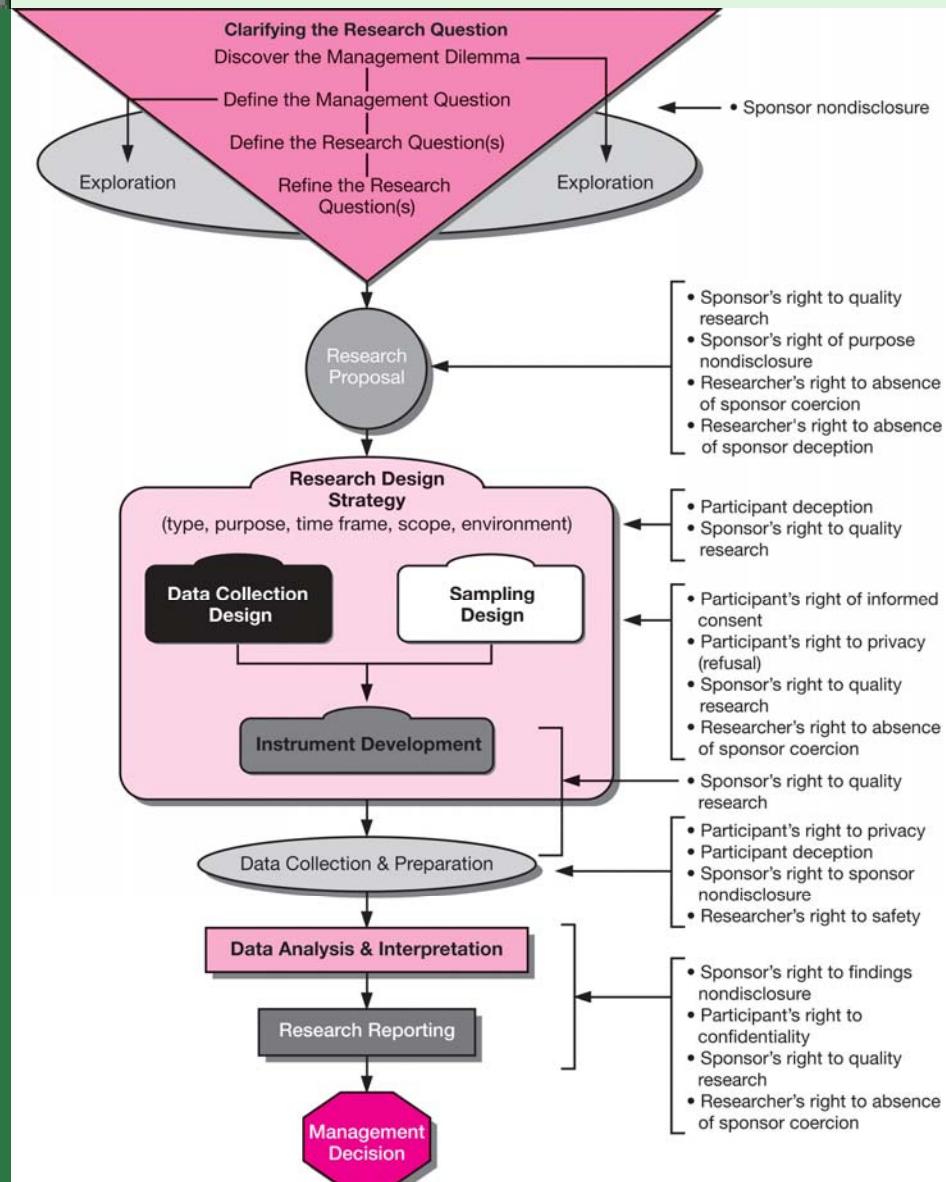


PulsePoint: Research Revelation

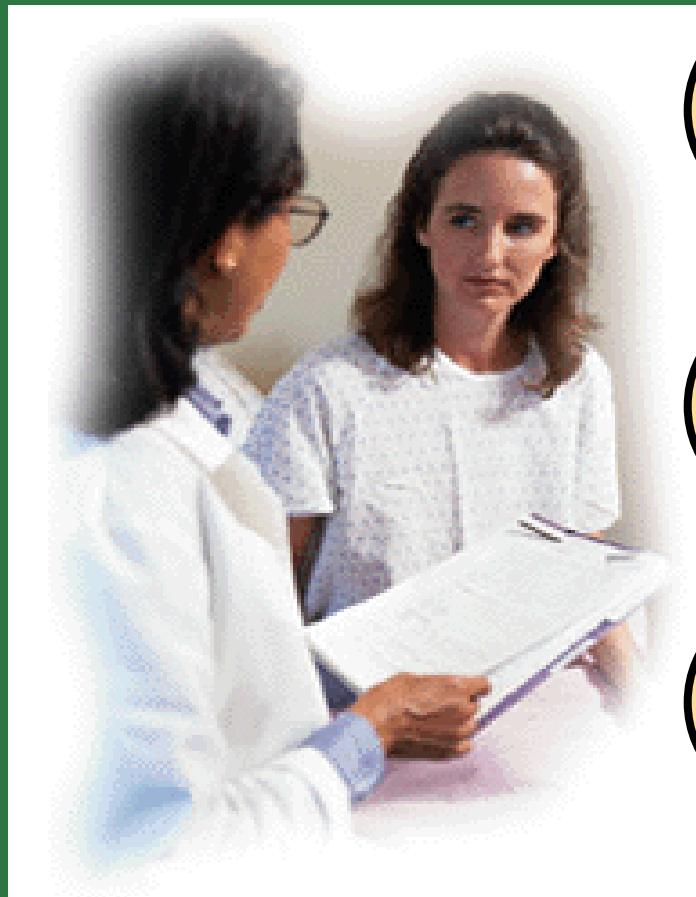
76

The percent of employees who say that during the past year they have observed illegal or unethical behaviors at their companies.

Ethical Issues at all Stages of the Research Process



Ethical Treatment of Participants



Explain study benefits

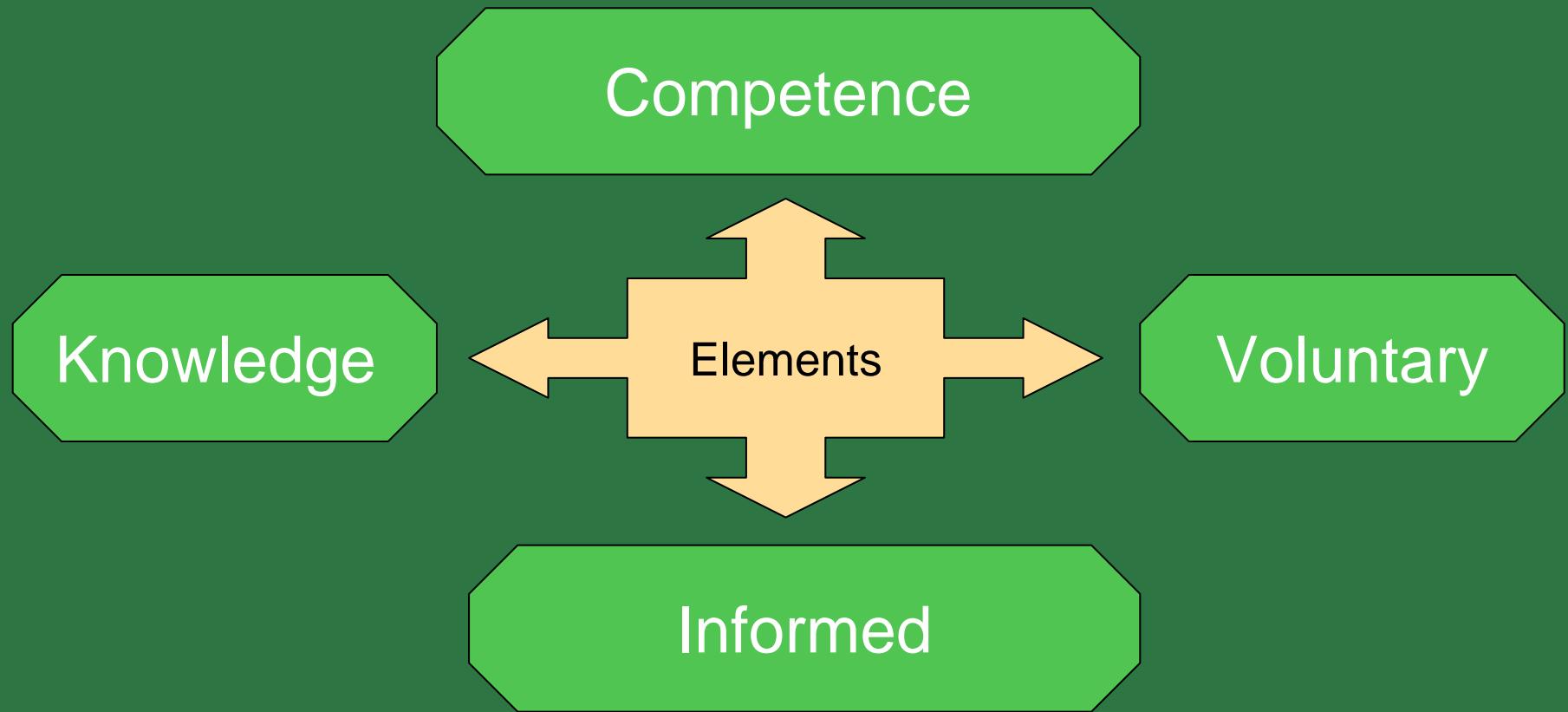
**Explain participant
rights and protections**

**Obtain informed
consent**

Components of Informed Consent

- Identify researchers
- Describe survey topic
- Describe target sample
- Identify sponsor
- Describe purpose of research
- Promise anonymity and confidentiality
- Give “good-faith” estimate of required time commitment
- State participation is voluntary
- State item-non response is acceptable
- Ask for permission

Characteristics of Informed Consent



Ethical Responsibilities



Can you handle the truth?

Direct from kids to you: GMI Global Youth Panel.

Brace yourself. You're about to hear what kids really think, unfiltered by parents. GMI, world leader in global panels, has teamed with some of the most popular youth sites on the internet, to build the **first, global, direct-access youth panel**.

Through our exclusive network of partners, GMI is creating a **unique panel community of highly engaged and highly profiled youth**, aged 6-17. From our initial launch in the US and English-speaking nations, we will rapidly expand around the globe in dozens of other countries.

Fully compliant with COPPA and CARU regulations, we obtain parental consent to help you **safely and confidently field your study**. Highly relevant incentives ensure high response rates. Honest answers from kids provide a level of validity and safety never before achievable.

Are you ready for the truth?

Sample is available now. For a quote or to learn how our youth panel works, go to www.gmiglobal.com/youth.

Integrated solutions for market intelligence
GMI
www.gmiglobal.com/youth
Integrated Software
Global Panels
Service Bureau

Special guidelines apply to children!

- Informed consent means parental approval.

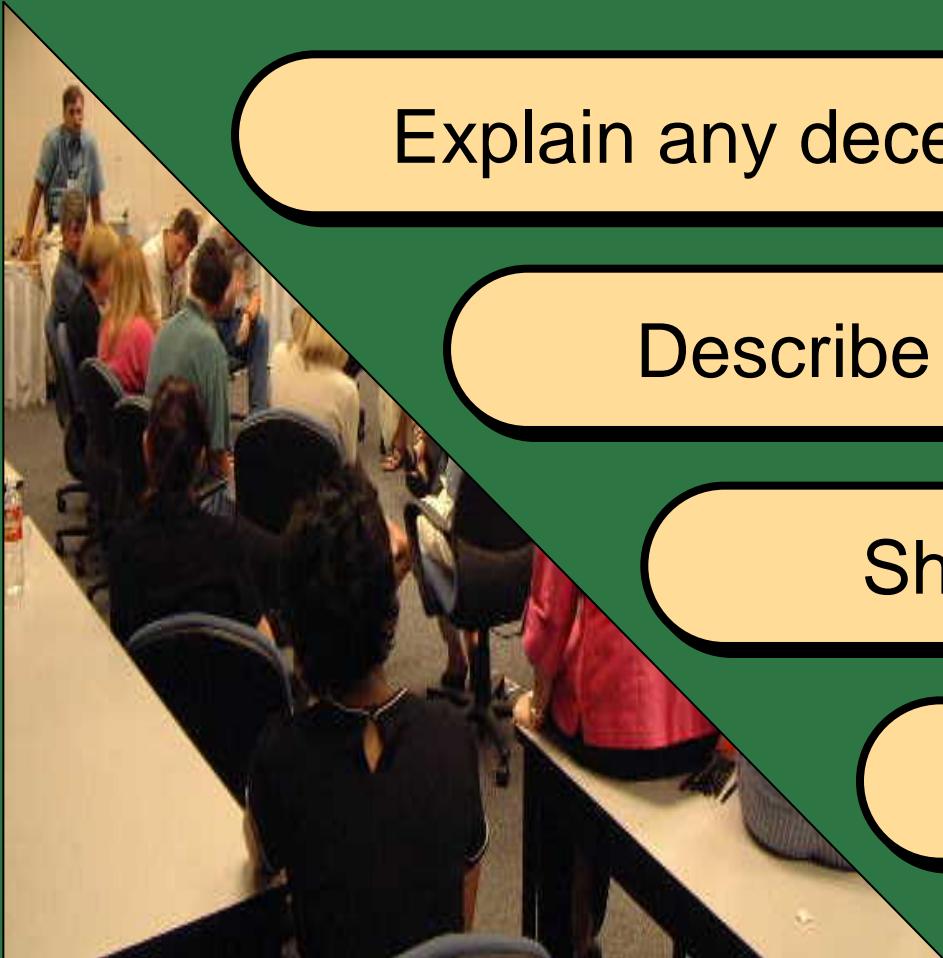
Deception



Disguising
non-research
activities

Camouflaging
true research
objectives

Debriefing



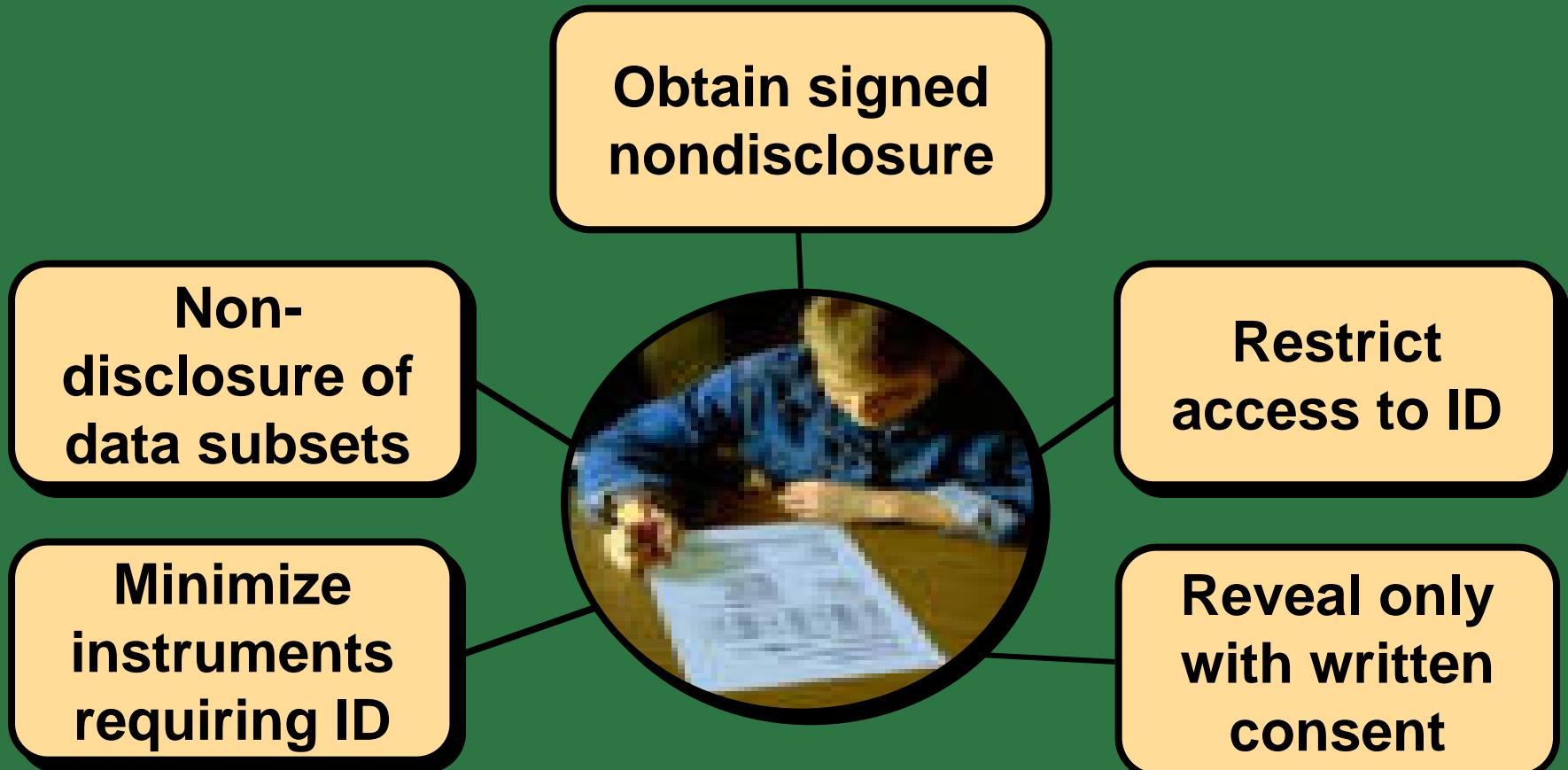
Explain any deception

Describe purpose

Share results

Provide follow-up

Participant Confidentiality

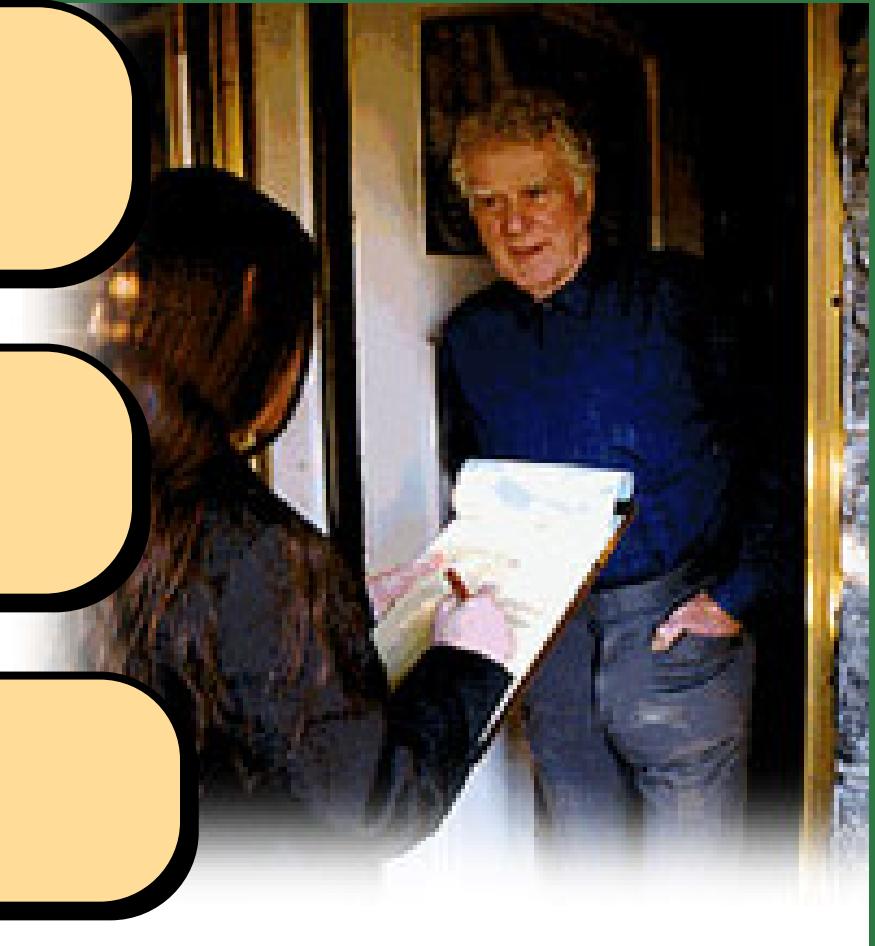


Right to Privacy

Right to refuse

Prior permission to
interview

Limit time required



The U.S. Safe Harbor Agreement

Notice

Choice

Access

Security

Onward
Transfer

Data Integrity

Enforcement

Confidentiality

Sponsor Nondisclosure

Purpose Nondisclosure

Findings Nondisclosure



What To Do If Coerced?

Educate
on
purpose

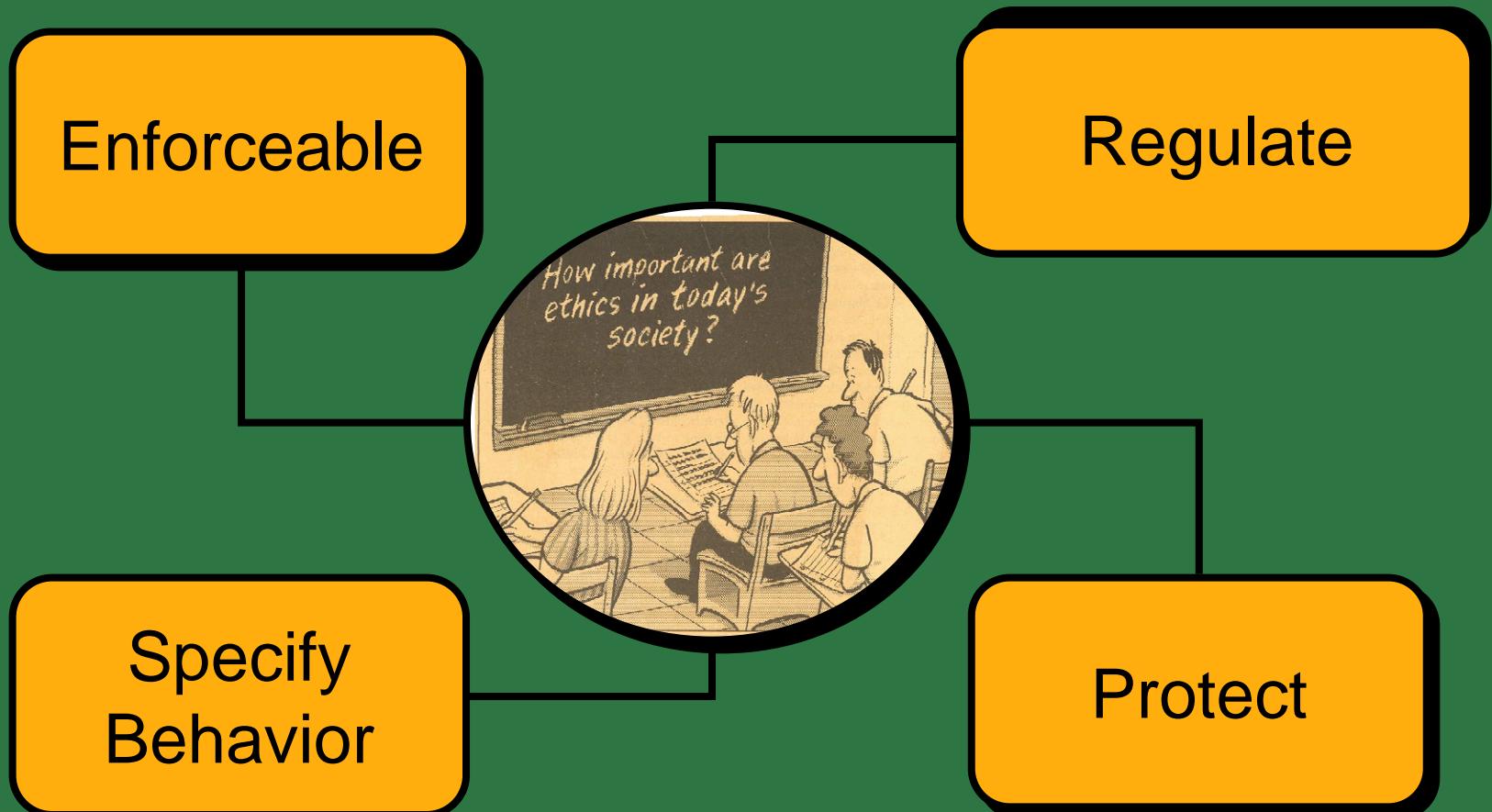
Emphasize
fact-finding
role

Explain
problems

Terminate
relationship



Effective Codes of Ethics

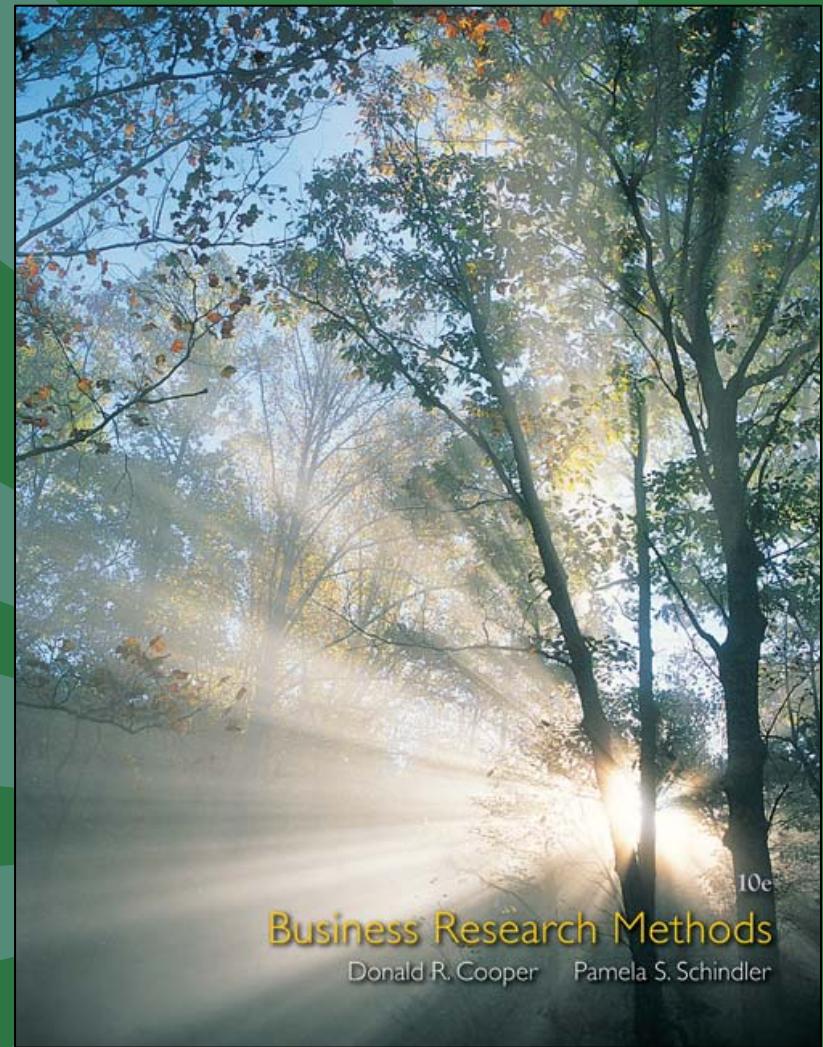


Key Terms

- Code of ethics
- Confidentiality
- Debriefing
- Deception
- Ethics
- Informed consent
- Nondisclosure
 - Findings
 - Purpose
 - Sponsor
- Right to privacy
- Right to quality
- Right to safety

Chapter 3

Thinking Like a Researcher





Learning Objectives

Understand . . .

- The terminology used by professional researchers employing scientific thinking.
- What you need to formulate a solid research hypothesis.
- The need for sound reasoning to enhance research results.

PulsePoint: Research Revelations

97

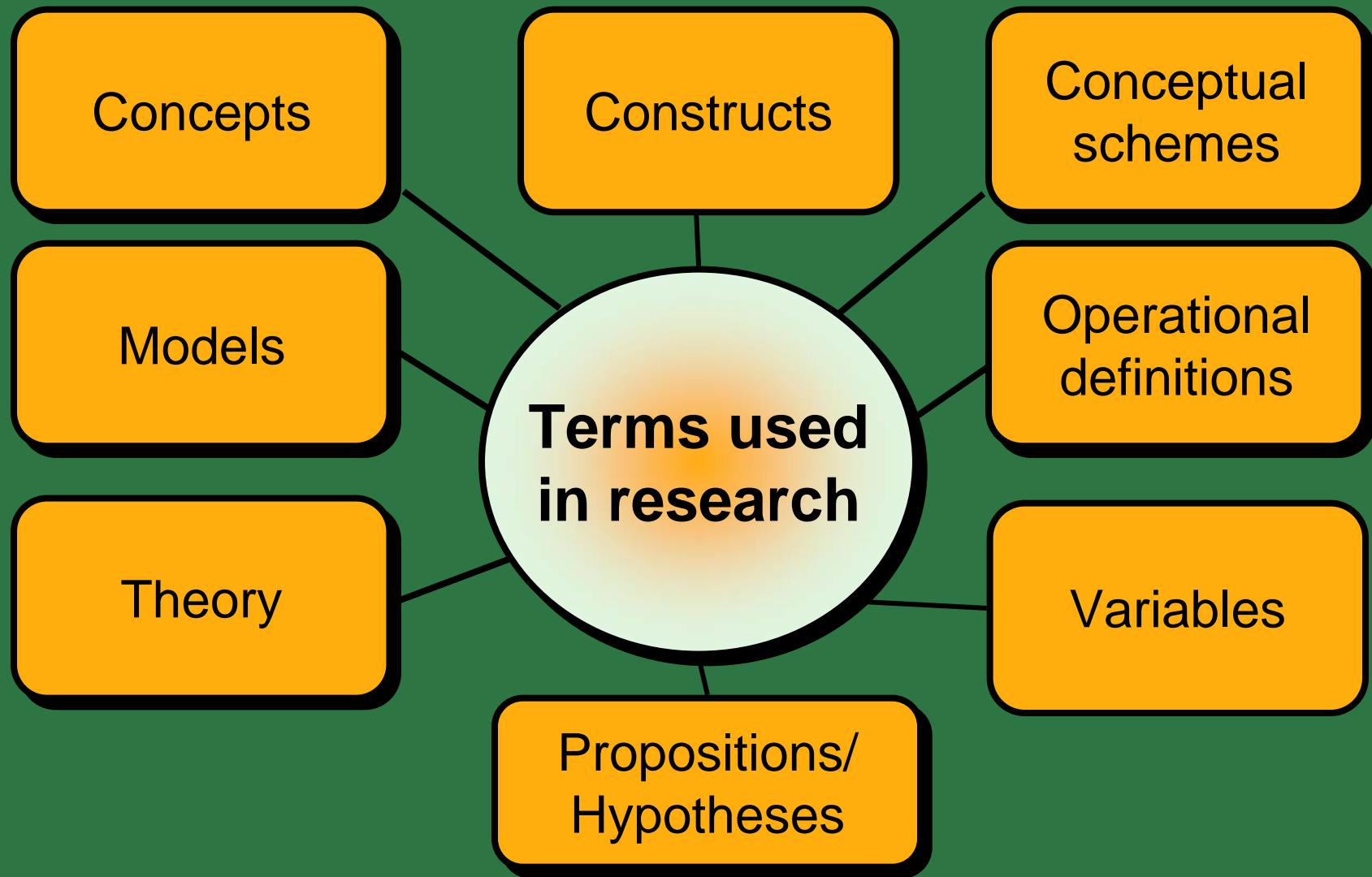
The percent of consumer and business technology variables in which ***technophobia*** plays an important role in an adults psychological reaction.

Research and Intuition

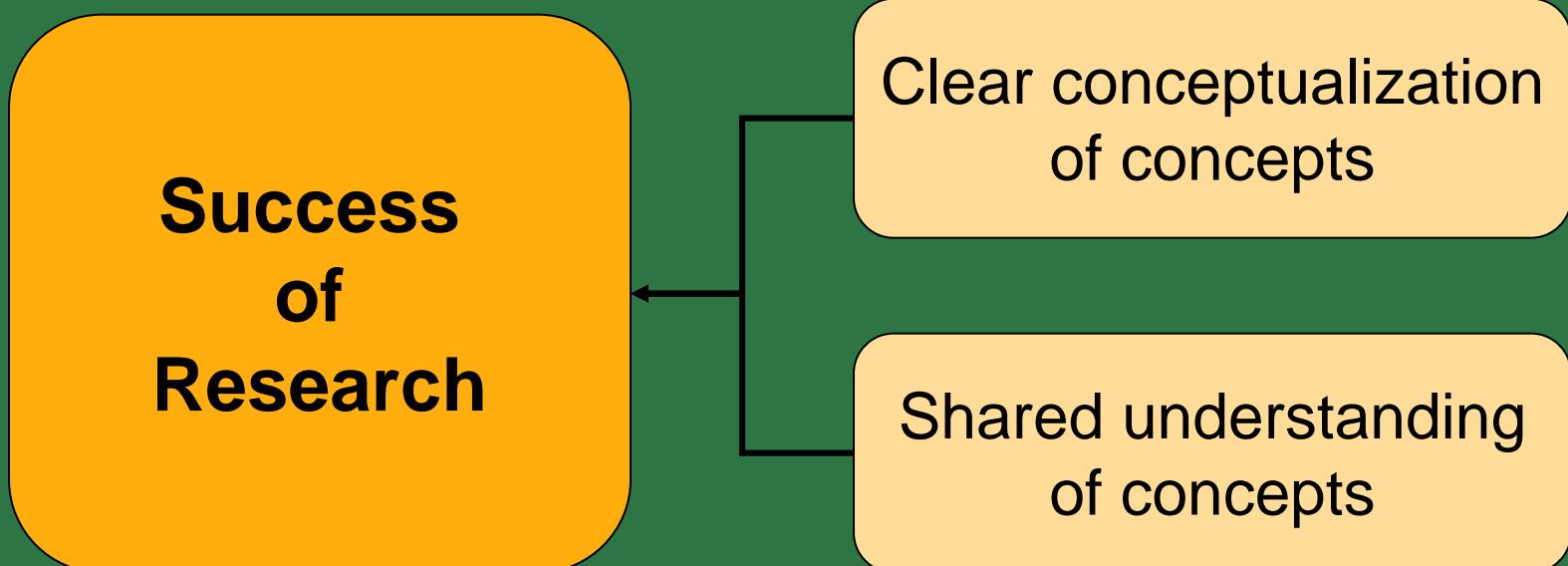
“If we ignore supernatural inspiration, intuition is based on two things: experience and intelligence. The more experience I have with you, the more likely I am to encounter repetition of activities and situations that help me learn about you. The smarter I am, the more I can abstract from those experiences to find connections and patterns among them.”

Jeffrey Bradshaw, creator of the software that searches databases

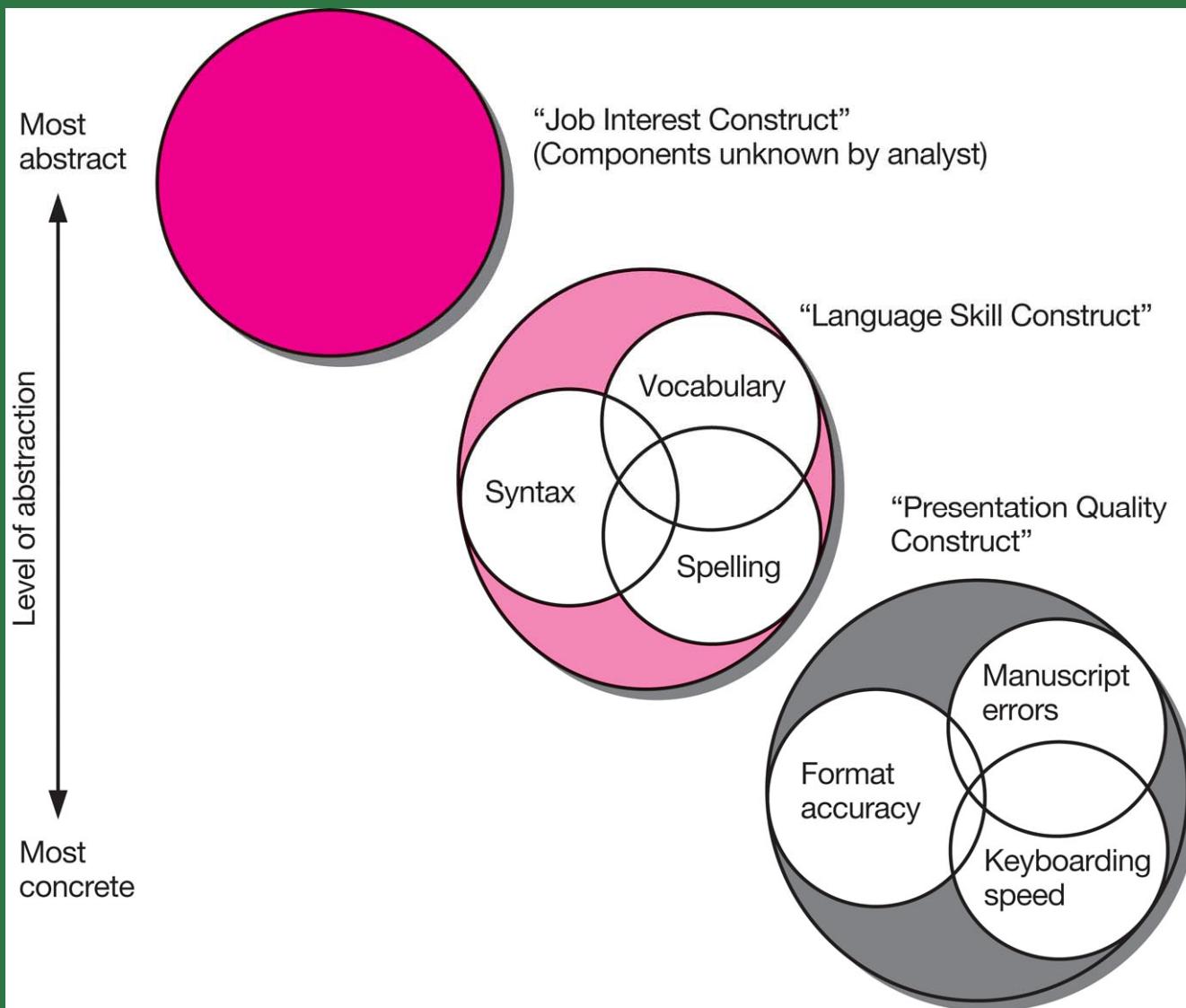
Language of Research



Language of Research



Job Redesign Constructs and Concepts

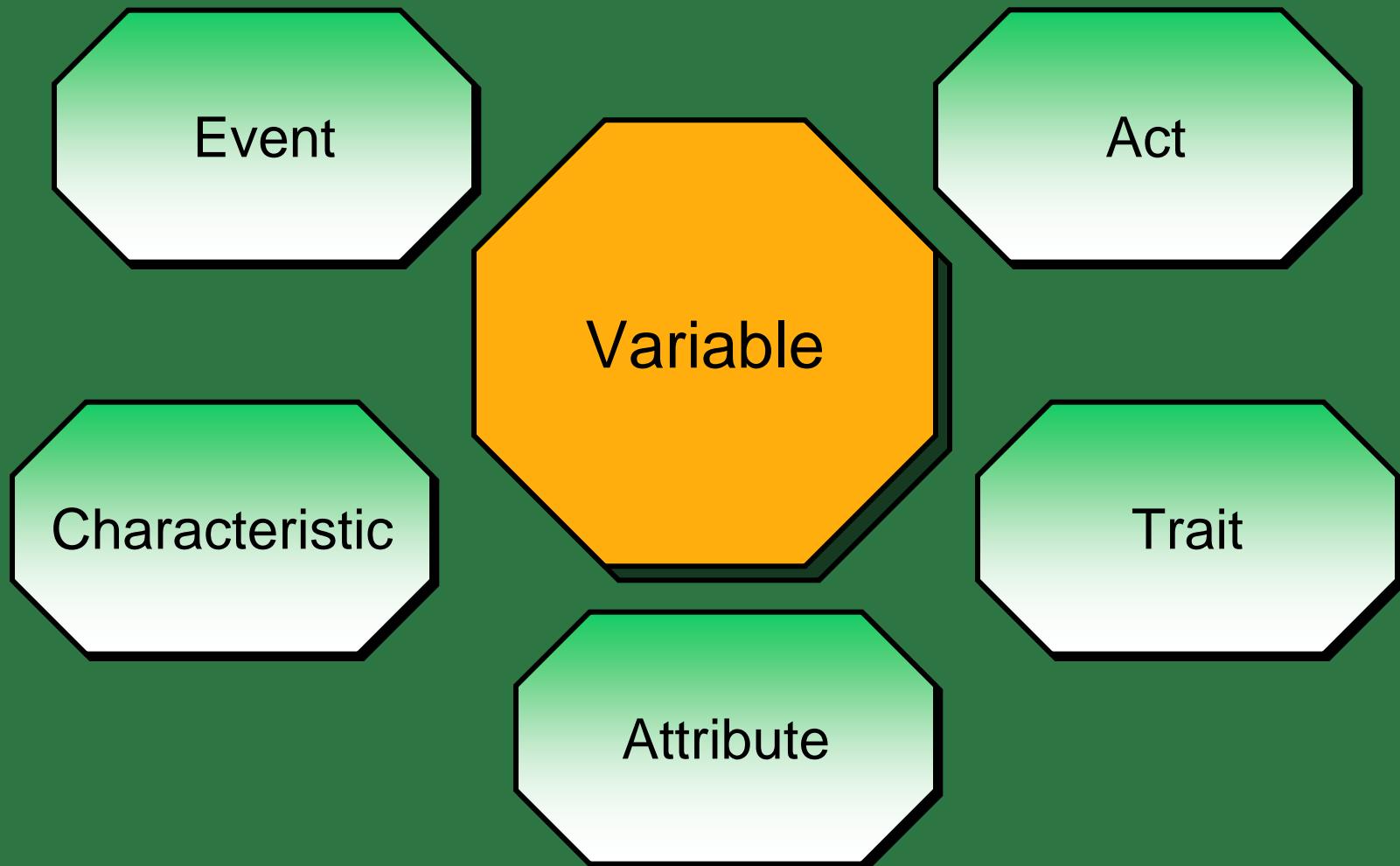


Operational Definitions

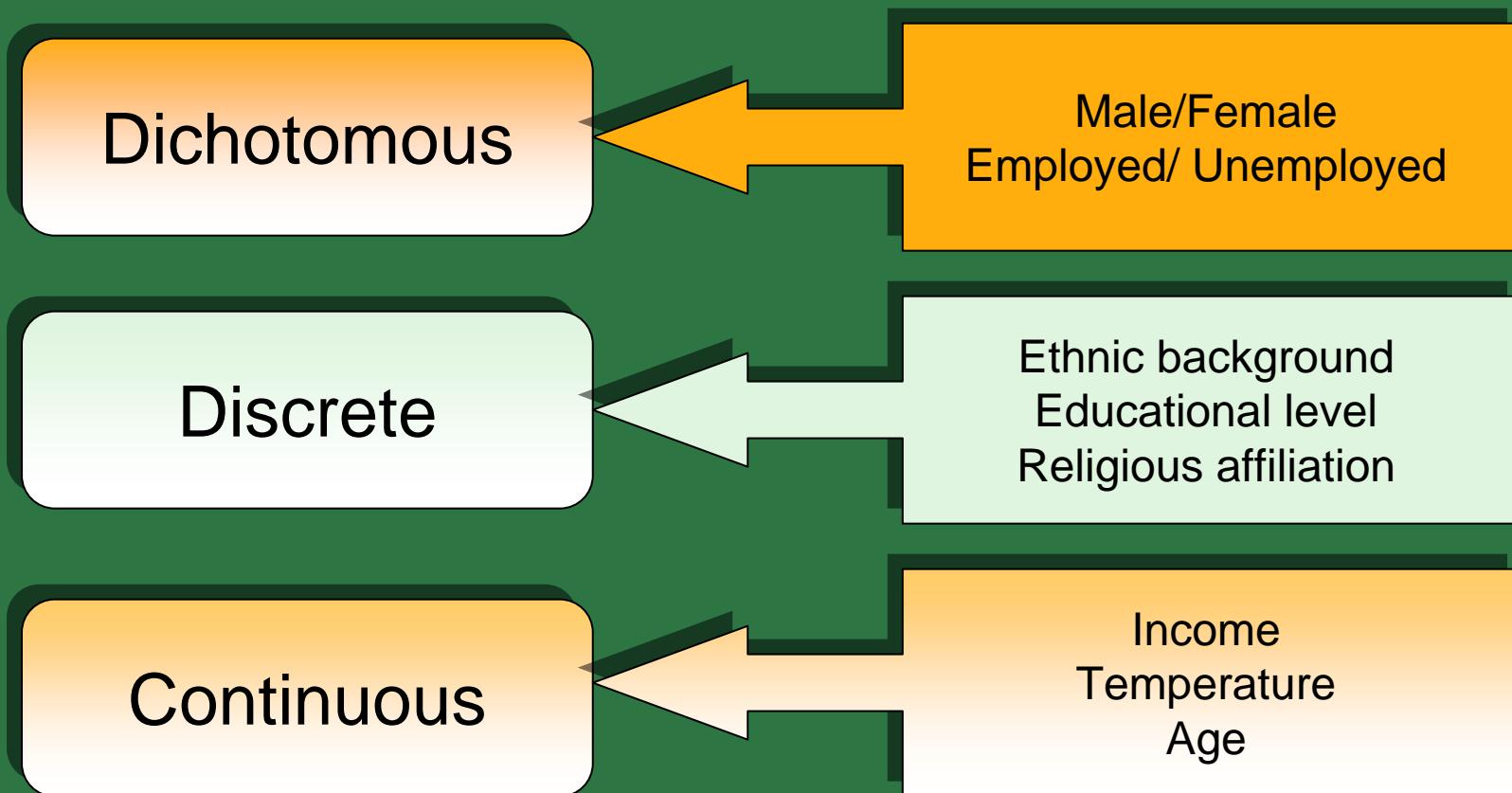
**How can we define the variable
“class level of students”?**

- Freshman
- Sophomore
- Junior
- Senior
- < 30 credit hours
- 30-50 credit hours
- 60-89 credit hours
- > 90 credit hours

A Variable Is the Property Being Studied



Types of Variables



Independent and Dependent Variable Synonyms

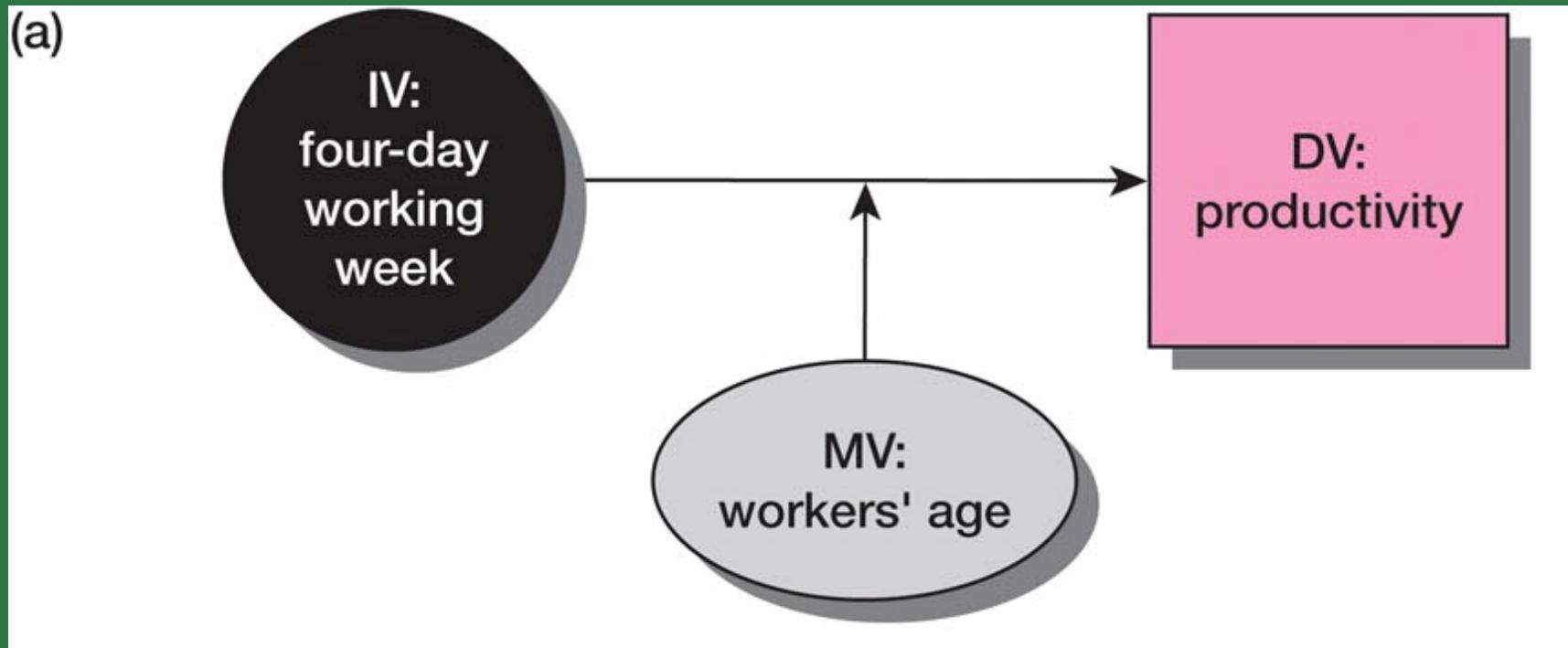
Independent Variable (IV)

- Predictor
- Presumed cause
- Stimulus
- Predicted from...
- Antecedent
- Manipulated

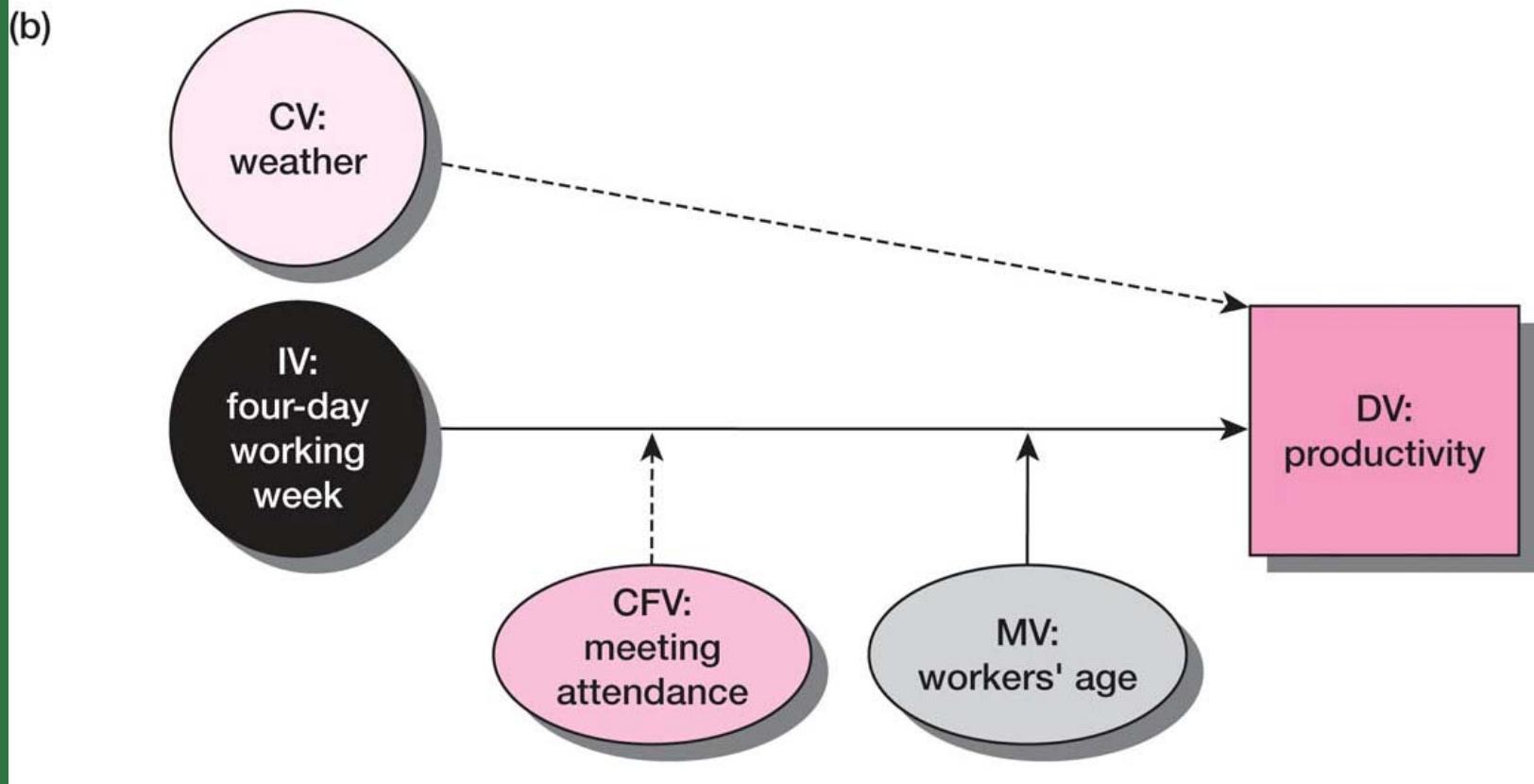
Dependent Variable (DV)

- Criterion
- Presumed effect
- Response
- Predicted to....
- Consequence
- Measured outcome

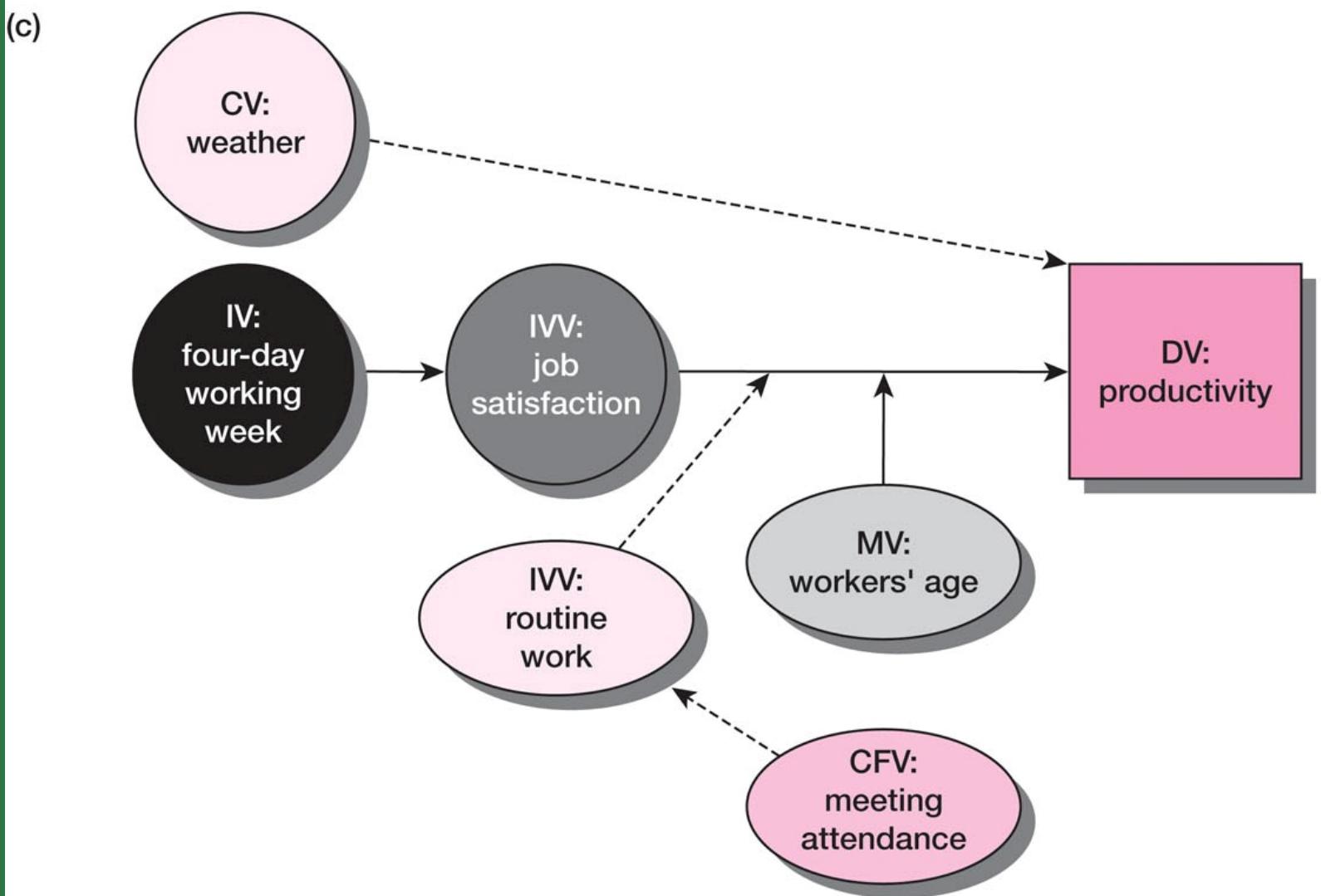
Relationships Among Variable Types



Relationships Among Variable Types



Relationships Among Variable Types



Moderating Variables (MV)

- The introduction of a four-day week (**IV**) will lead to higher productivity (**DV**), especially among younger workers (**MV**)
- The switch to commission from a salary compensation system (**IV**) will lead to increased sales (**DV**) per worker, especially more experienced workers (**MV**).
- The loss of mining jobs (**IV**) leads to acceptance of higher-risk behaviors to earn a family-supporting income (**DV**) – particularly among those with a limited education (**MV**).

Extraneous Variables (EV)

- With new customers (EV-control), a switch to commission from a salary compensation system (IV) will lead to increased sales productivity (DV) per worker, especially among younger workers (MV).
- Among residents with less than a high school education (EV-control), the loss of jobs (IV) leads to high-risk behaviors (DV), especially due to the proximity of the firing range (MV).



Intervening Variables (IVV)

- The switch to a commission compensation system (IV) will lead to higher sales (DV) by increasing overall compensation (IVV).
- A promotion campaign (IV) will increase savings activity (DV), especially when free prizes are offered (MV), but chiefly among smaller savers (EV-control). The results come from enhancing the motivation to save (IVV).

Propositions and Hypotheses

- Brand Manager Jones (**case**) has a higher-than-average achievement motivation (**variable**).

Generalization

- Brand managers in Company Z (**cases**) have a higher-than-average achievement motivation (**variable**).

Hypothesis Formats

Descriptive Hypothesis

- In Detroit, our potato chip market share stands at 13.7%.
- American cities are experiencing budget difficulties.

Research Question

- What is the market share for our potato chips in Detroit?
- Are American cities experiencing budget difficulties?

Relational Hypotheses

Correlational

- Young women (under 35) purchase fewer units of our product than women who are older than 35.
- The number of suits sold varies directly with the level of the business cycle.

Causal

- An increase in family income leads to an increase in the percentage of income saved.
- Loyalty to a grocery store increases the probability of purchasing that store's private brand products.

The Role of Hypotheses

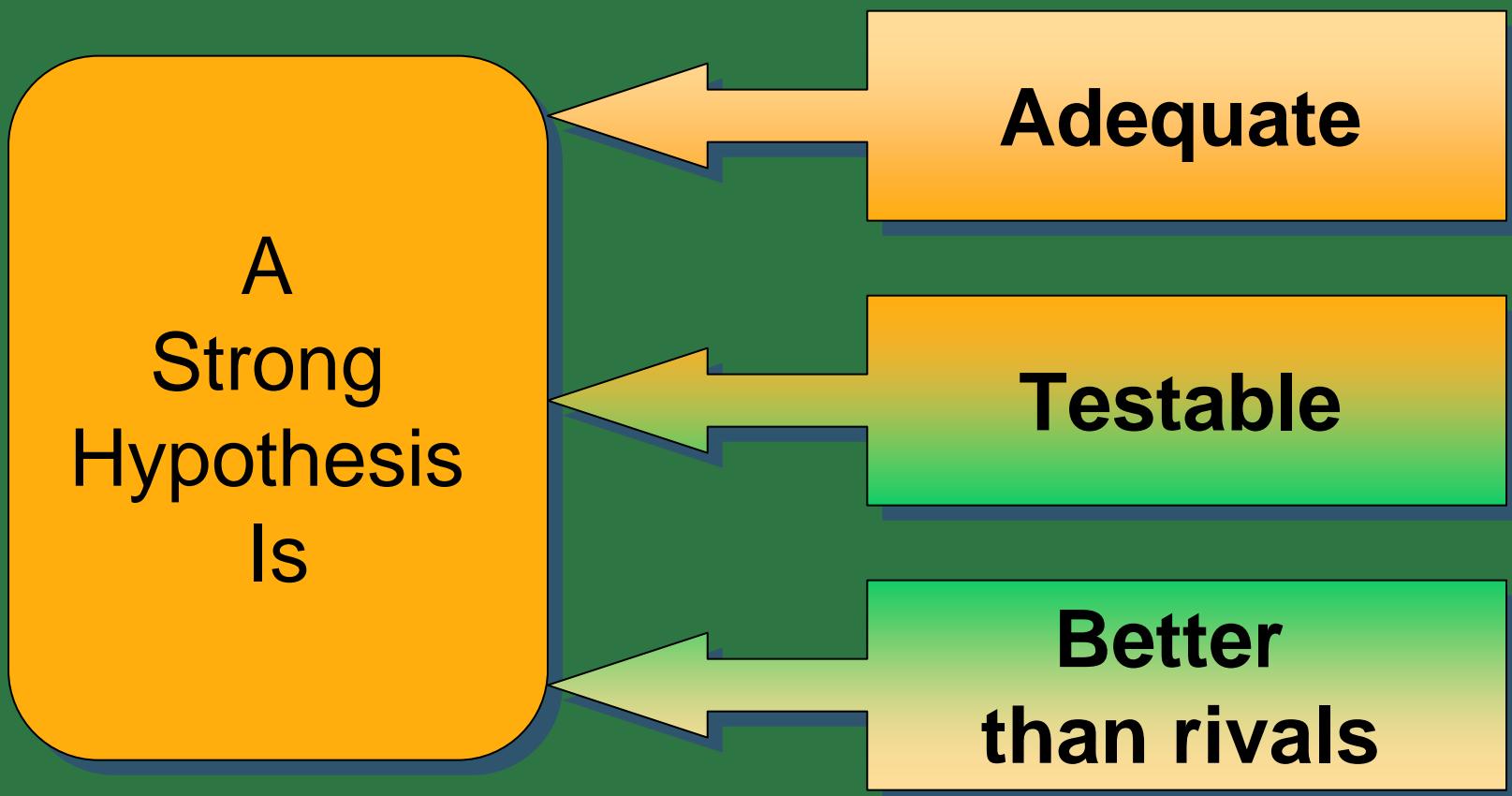
Guide the direction of the study

Identify relevant facts

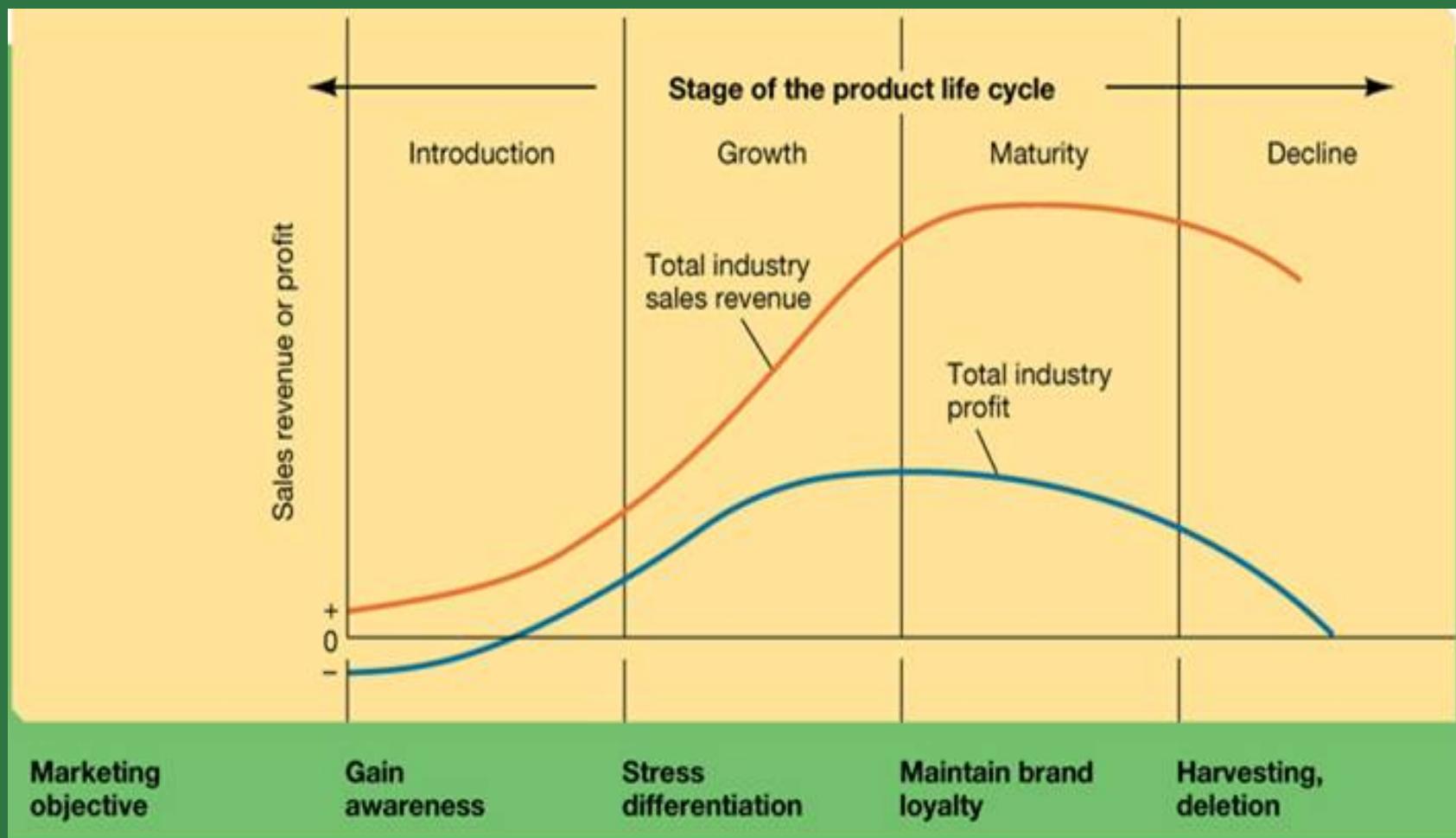
Suggest most appropriate research design

Provide framework for organizing resulting conclusions

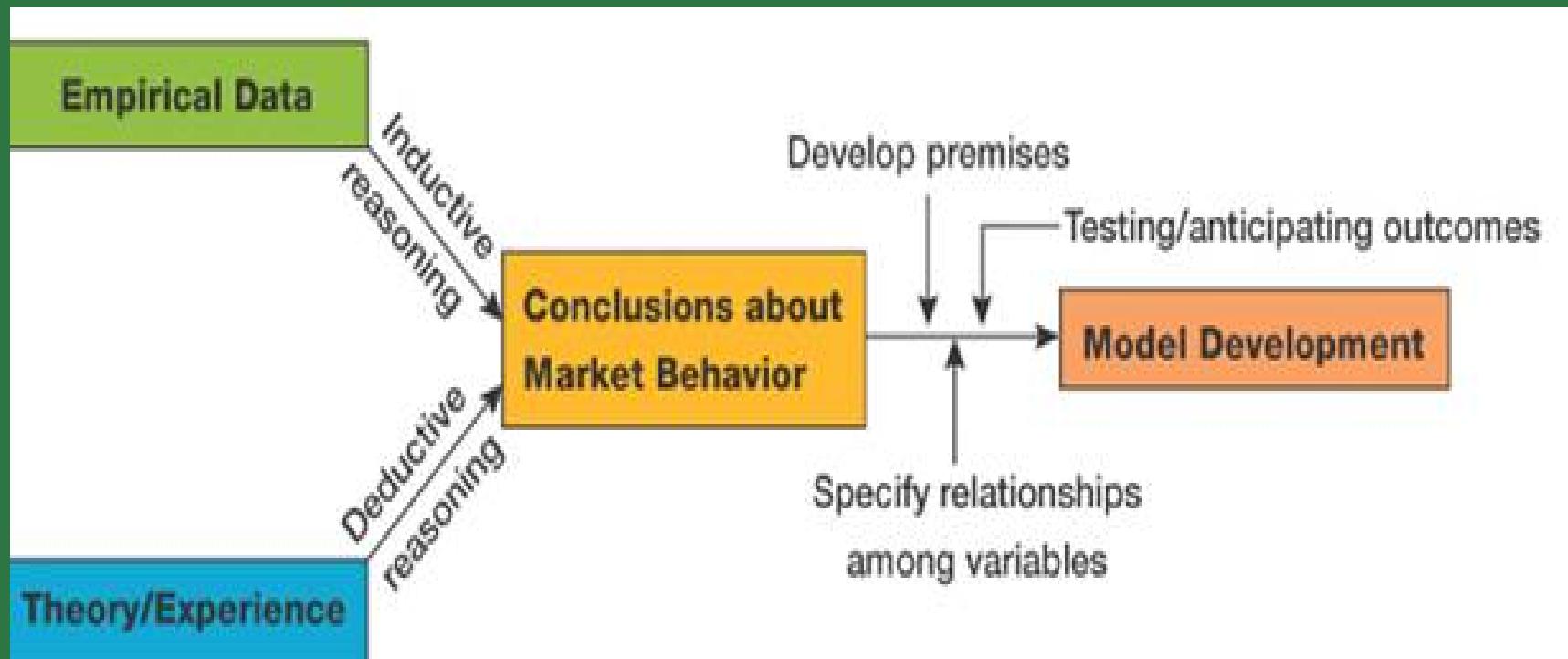
Characteristics of Strong Hypotheses



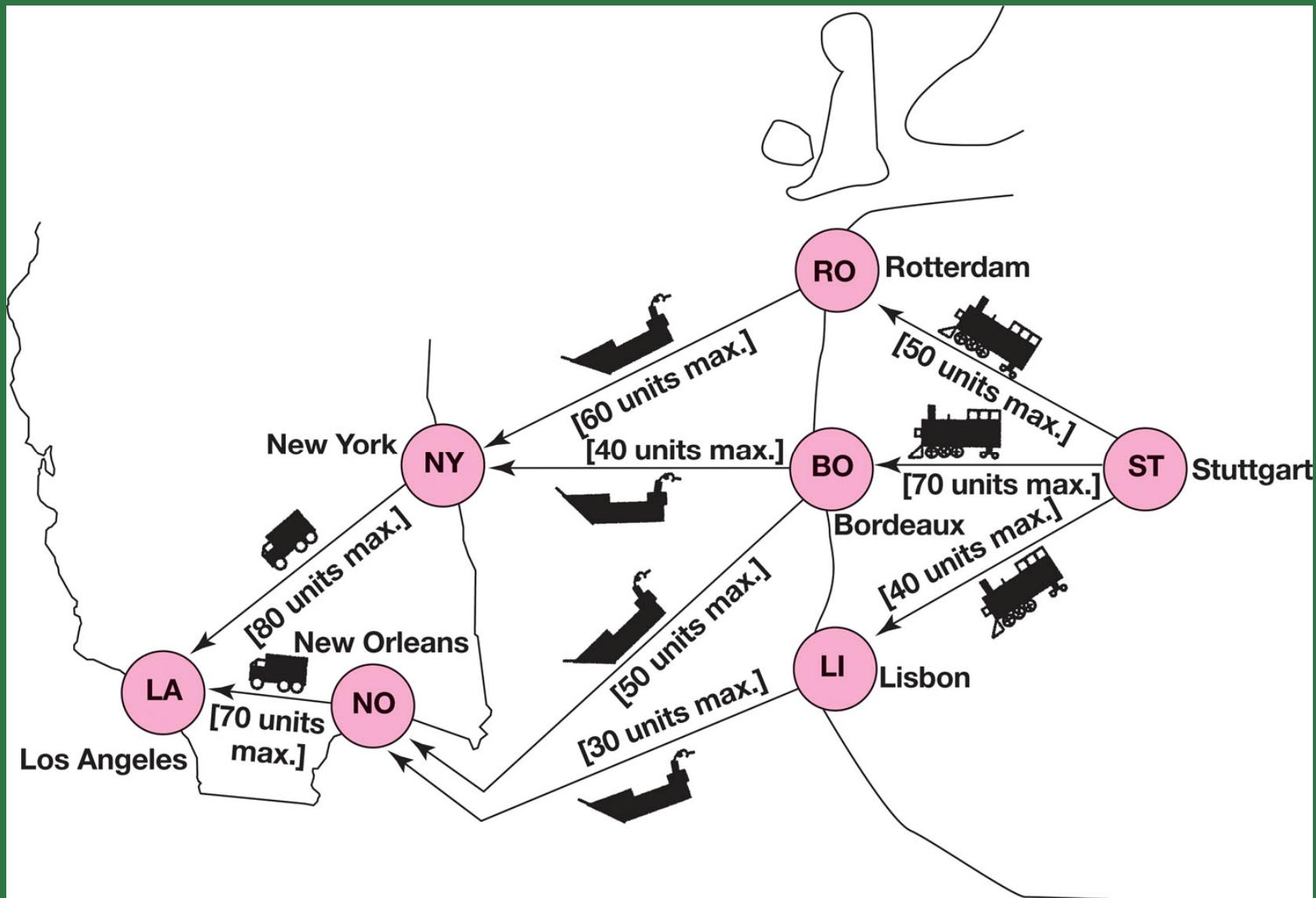
Theory within Research



The Role of Reasoning



A Model within Research



The Scientific Method

Direct observation

Clearly defined variables

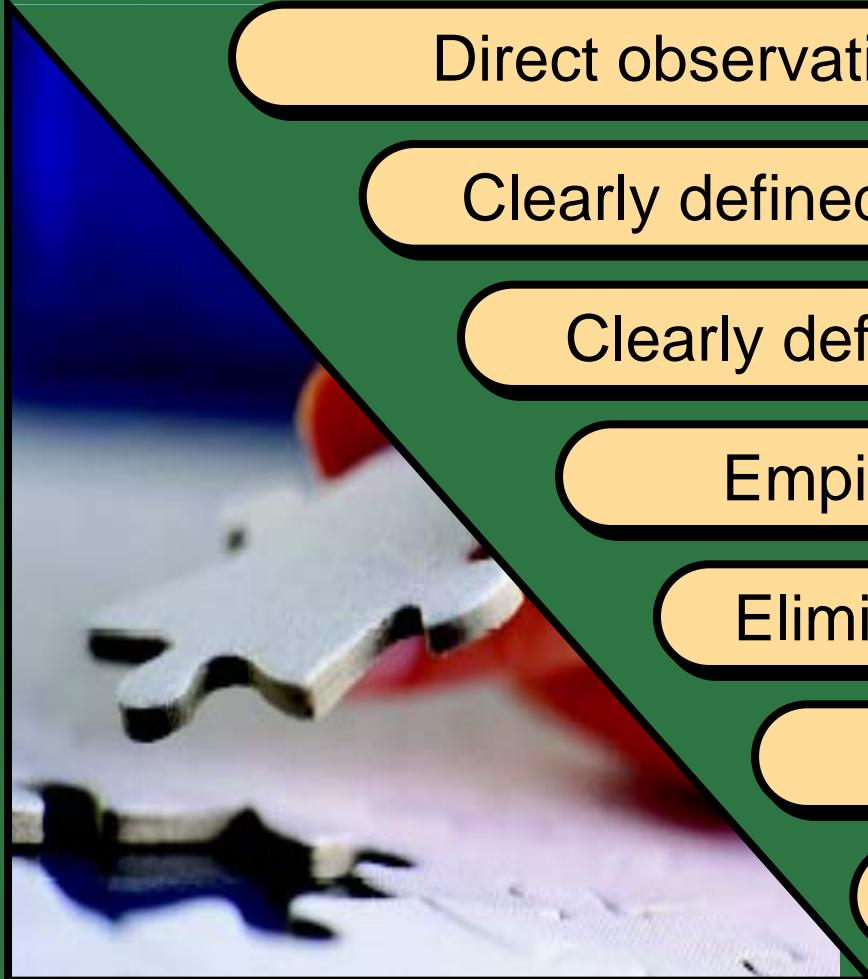
Clearly defined methods

Empirically testable

Elimination of alternatives

Statistical justification

Self-correcting process



Researchers

- Encounter problems
- State problems
- Propose hypotheses
- Deduce outcomes
- Formulate rival hypotheses
- Devise and conduct empirical tests
- Draw conclusions



Curiosity Is the Ally of a Researcher

The Wheel.
The Lightbulb.
The Microchip.
Sliced bread.

Where would the
world be without
curiosity?

Curiosity. It's in our nature. It's a part of our daily lives. It's one of the most significant driving forces behind all civilization.

And at Synovate, it's what makes us tick. As one of the world's top research companies, curiosity is at the heart of all that we do. Our global network was created by bringing together like-minded intelligent people all of whom have the relentless desire to seek answers, and find better ways of doing things.

If you're curious to see our global market intelligence in action for yourself, email us at curious@synovate.com.

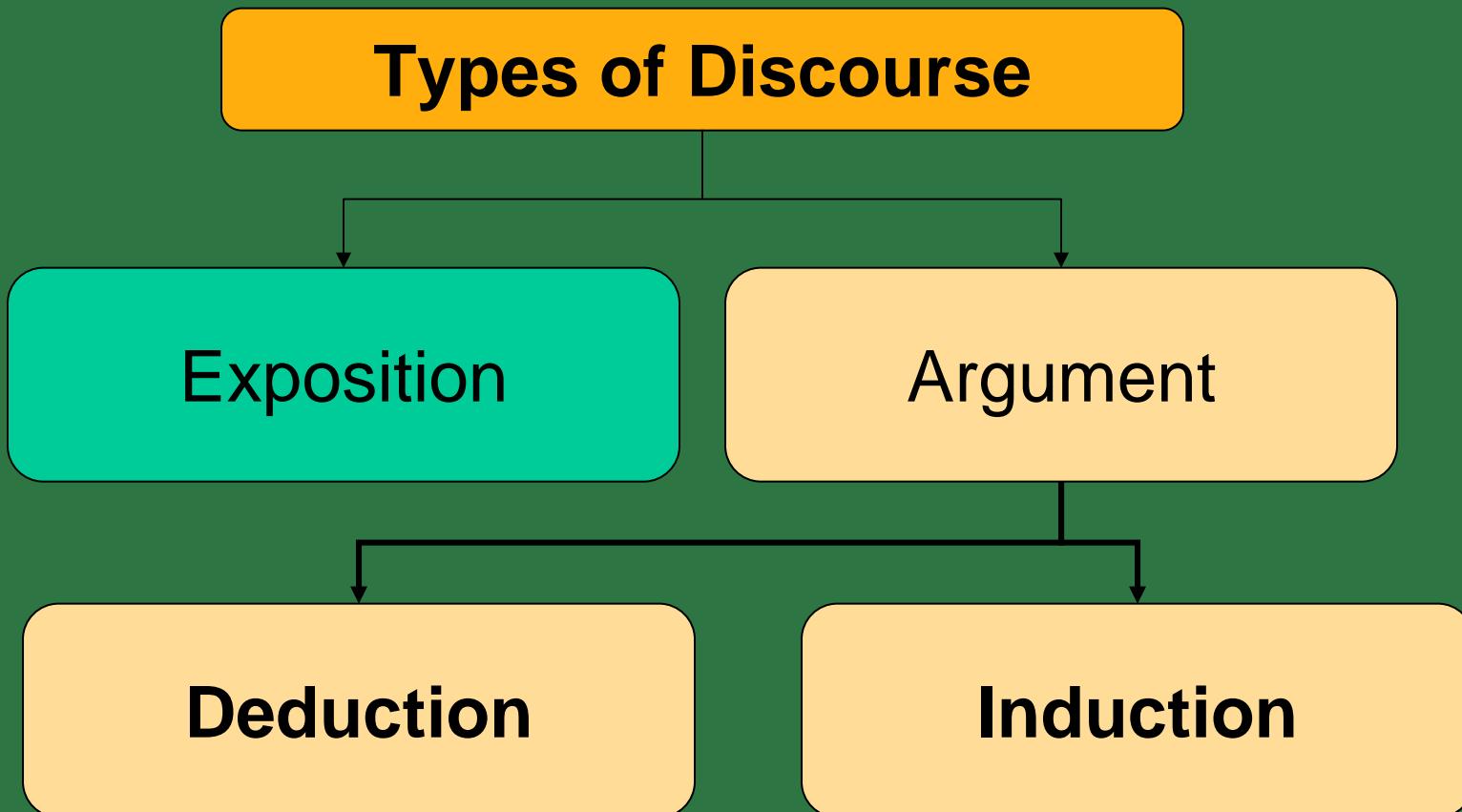
After all, history has proven us right.

www.synovate.com

Synovate's campaign associates important discoveries in research to a common trait of entrepreneurs: curiosity.

As one of the world's largest research organizations, it claims curiosity is "*what makes us tick.*"

Sound Reasoning



Deductive Reasoning



Inner-city household interviewing is especially difficult and expensive

This survey involves substantial inner-city household interviewing

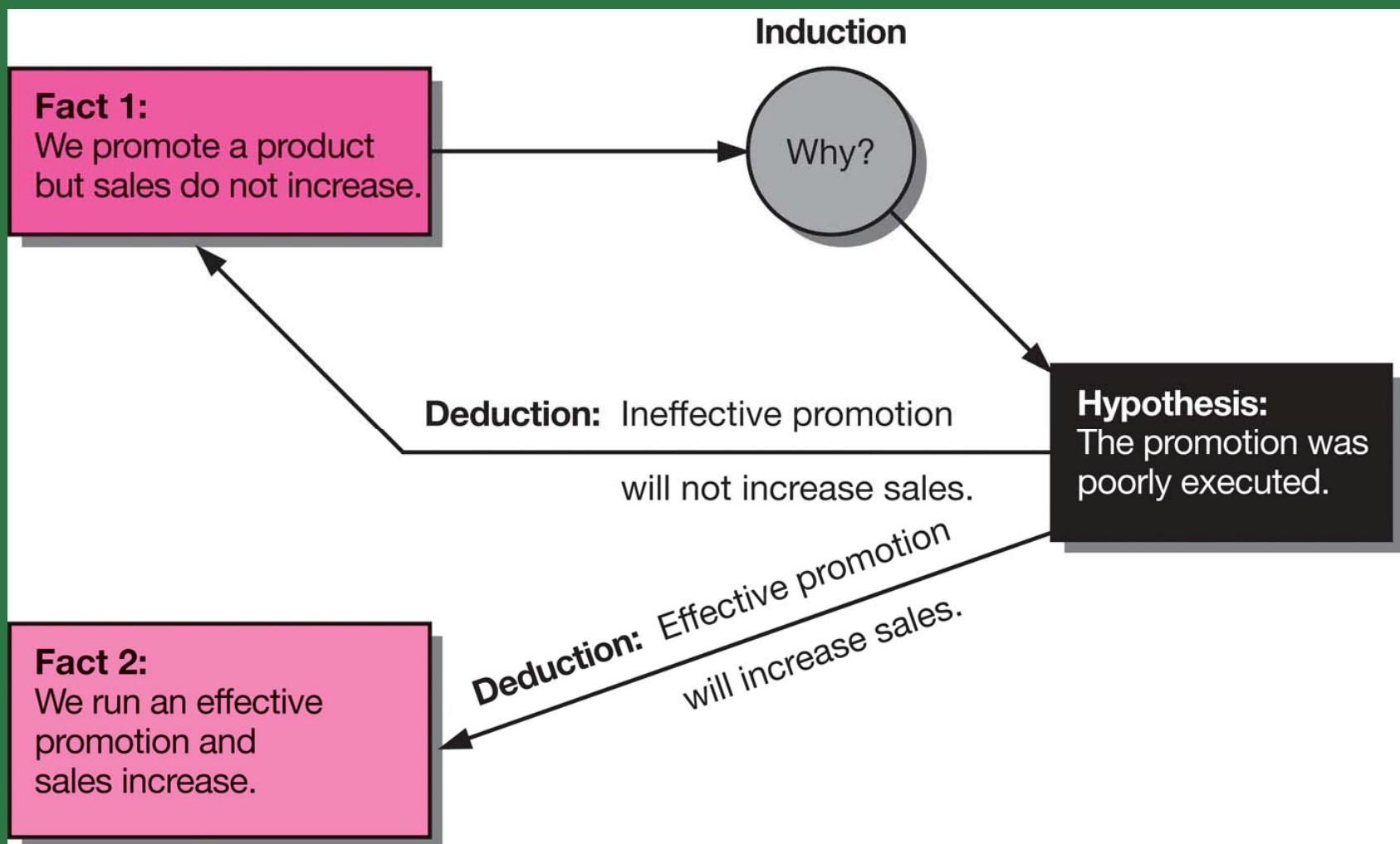
The interviewing in this survey will be especially difficult and expensive



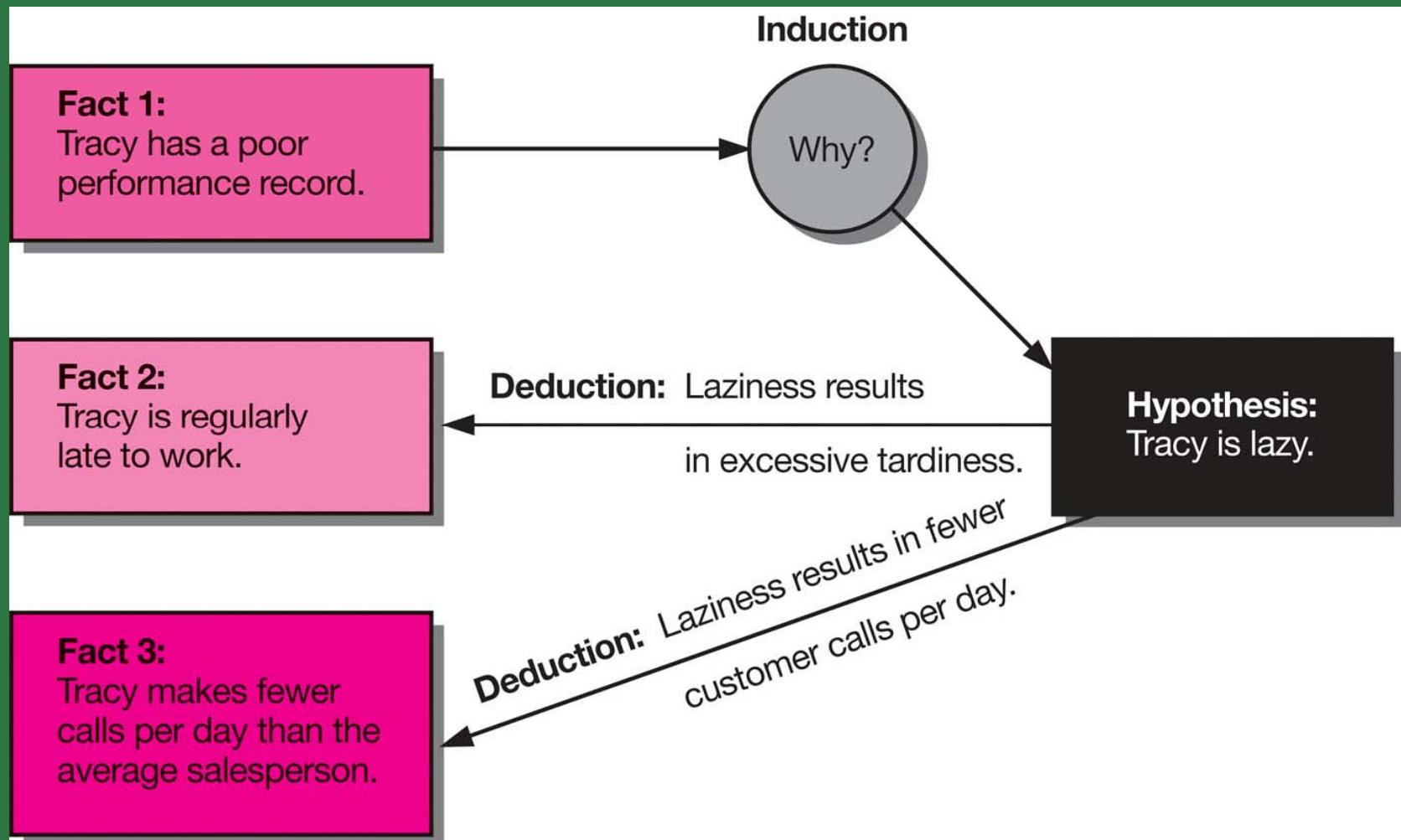
Inductive Reasoning

- Why didn't sales increase during our promotional event?
 - Regional retailers did not have sufficient stock to fill customer requests during the promotional period
 - A strike by employees prevented stock from arriving in time for promotion to be effective
 - A hurricane closed retail outlets in the region for 10 days during the promotion

Why Didn't Sales Increase?



Tracy's Performance

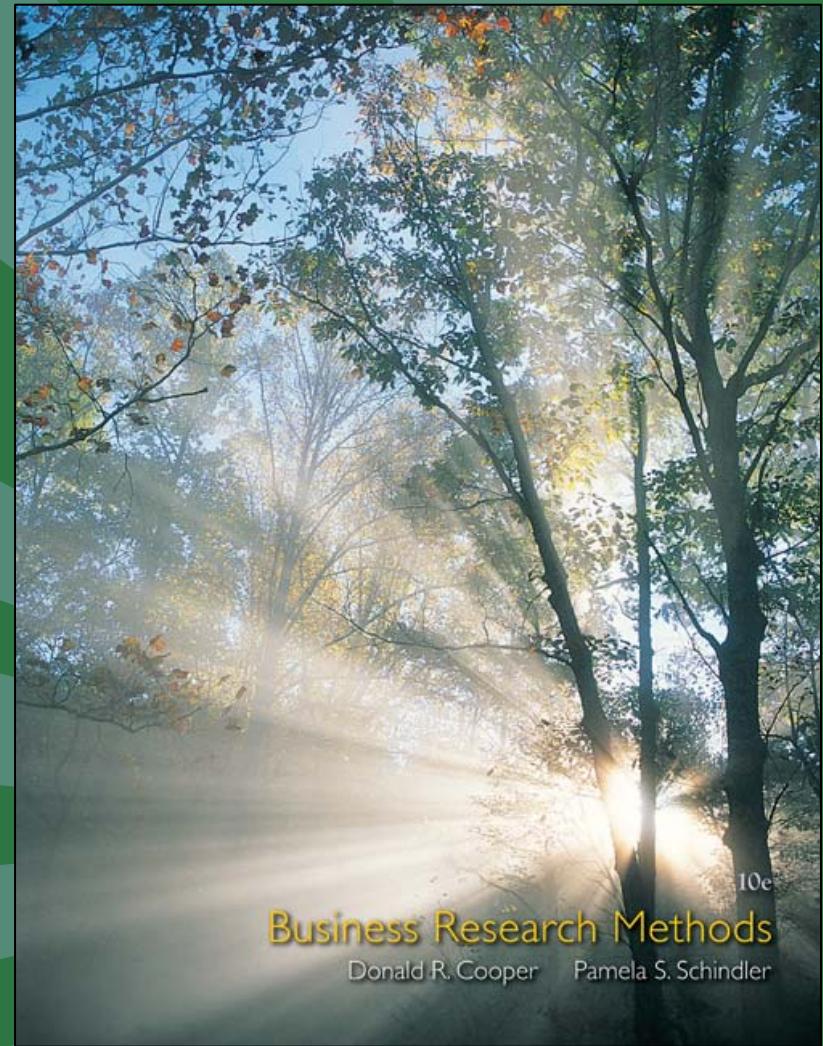


Key Terms

- Argument
- Case
- Concept
- Conceptual scheme
- Construct
- Deduction
- Empiricism
- Exposition
- Hypothesis
 - Correlational
 - Descriptive
 - Explanatory
 - Relational
- Hypothetical construct
- Induction
- Model
- Operational definition
- Proposition
- Sound reasoning
- Theory
- Variable
 - Control
 - Confounding (CFV)
 - Dependent (DV)
 - Extraneous (EV)
 - Independent (IV)
 - Intervening (IVV)
 - Moderating (MV)

Chapter 4

The Business Research Process: An Overview



Learning Objectives

Understand ...

- That research is decision- and dilemma-centered.
- That the clarified research question is the result of careful exploration and analysis and sets the direction for the research project.

Learning Objectives

Understand . . .

- How value assessments and budgeting influence the process for proposing research, and ultimately, research design.
- What is included in research design, data collection, and data analysis.
- Research process problems to avoid.

PulsePoint: Research Revelations

69

The percent of U.S. households
paying at least one bill online.

Curiosity Drives Research

“We keep moving forward, opening new doors, and doing new things, because we’re curious and curiosity keeps leading us down new paths.”

Walt Disney

Purpose of Research

Reduce the level of risk of a business decision.

**DON'T THROW GOOD MONEY
AT A BAD IDEA.**



Before you launch your new product, see if anyone wants it.

Pretest your new concept—online—with the company that pioneered marketing research on the Internet. Our panel of more than one million consumers from all across the Internet, the largest of its kind, includes exactly the people you want to reach.

Join the Research Revolution!™ Contact the world's most experienced Internet marketing research company for studies online, on time, on target and on budget.

www.greenfield.com 888.291.9997

Evaluating the Value of Research



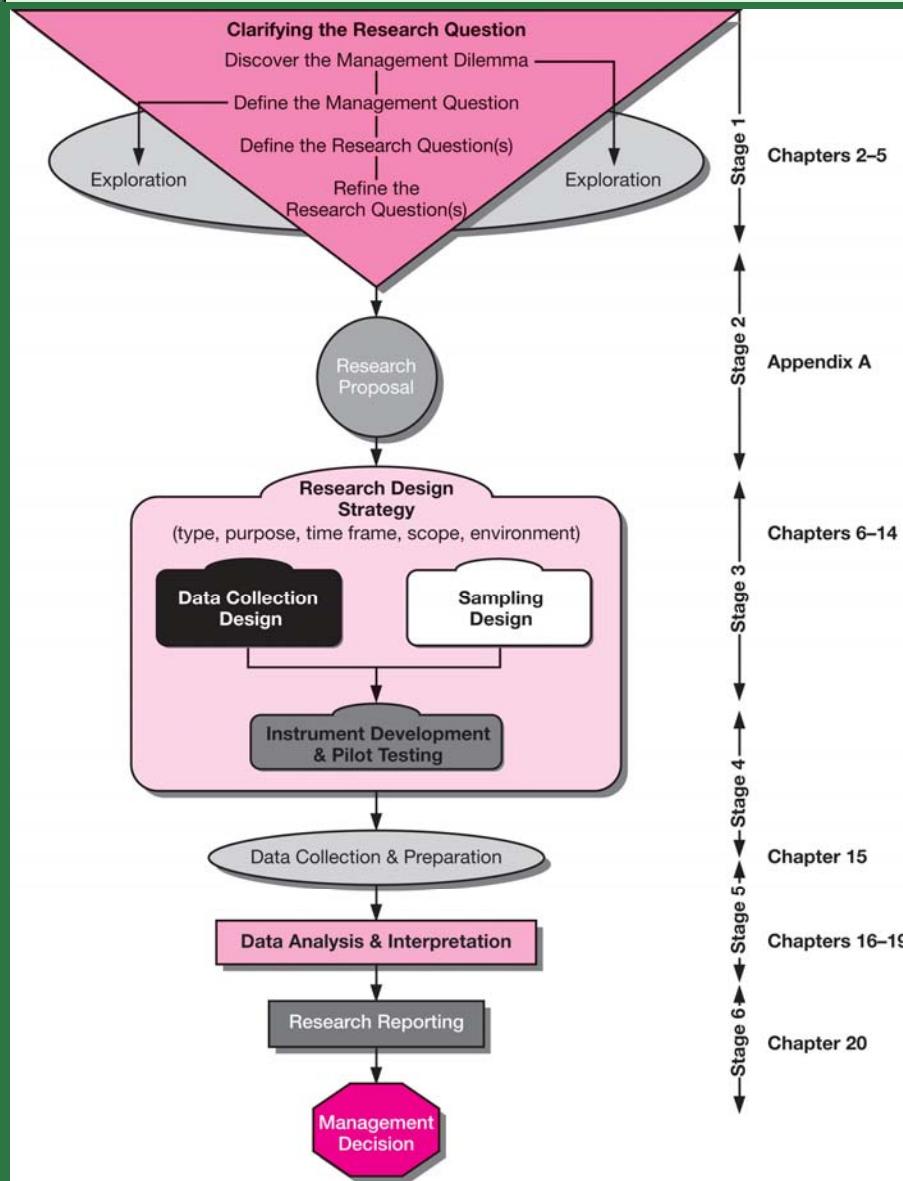
Option Analysis

Decision Theory

Prior or Interim Evaluation

Ex Post Facto Evaluation

The Business Research Process

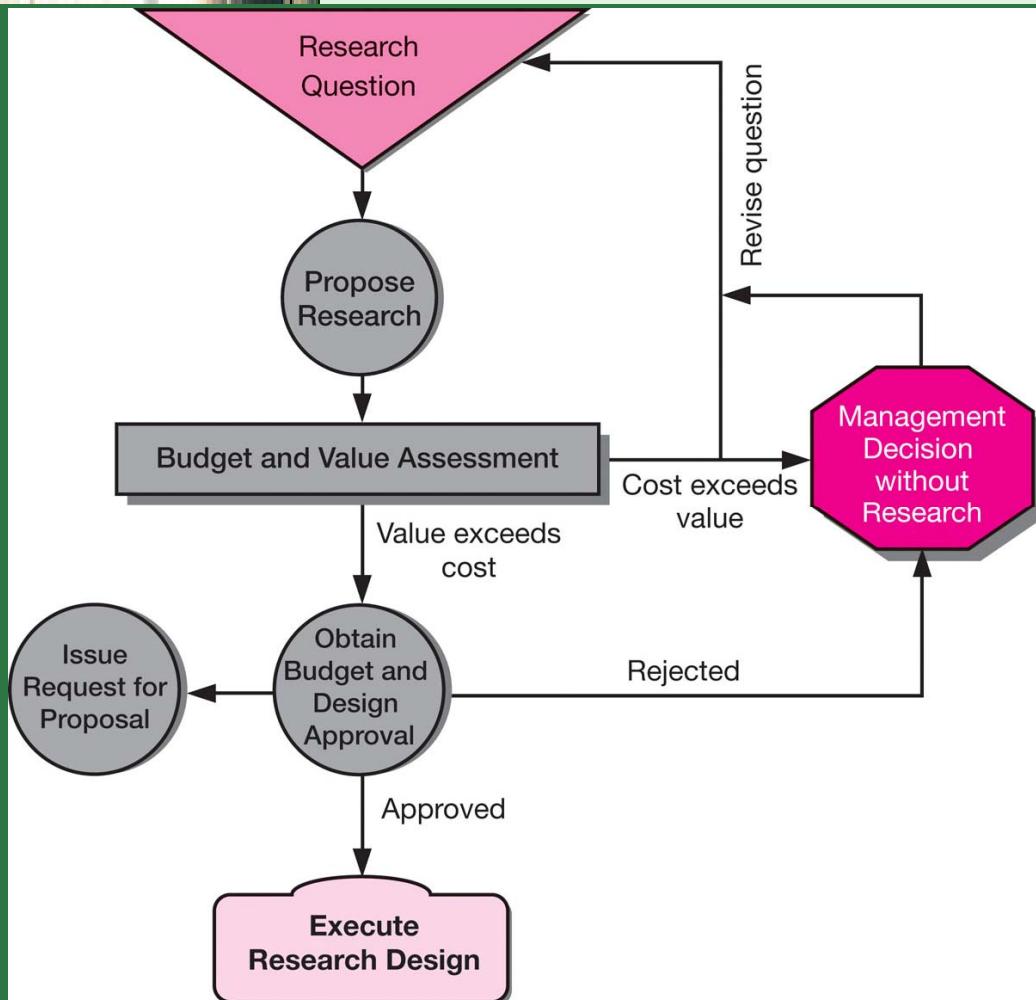


Stage 1: Clarifying the Research Question



Management-research question hierarchy process begins by identifying the management dilemma

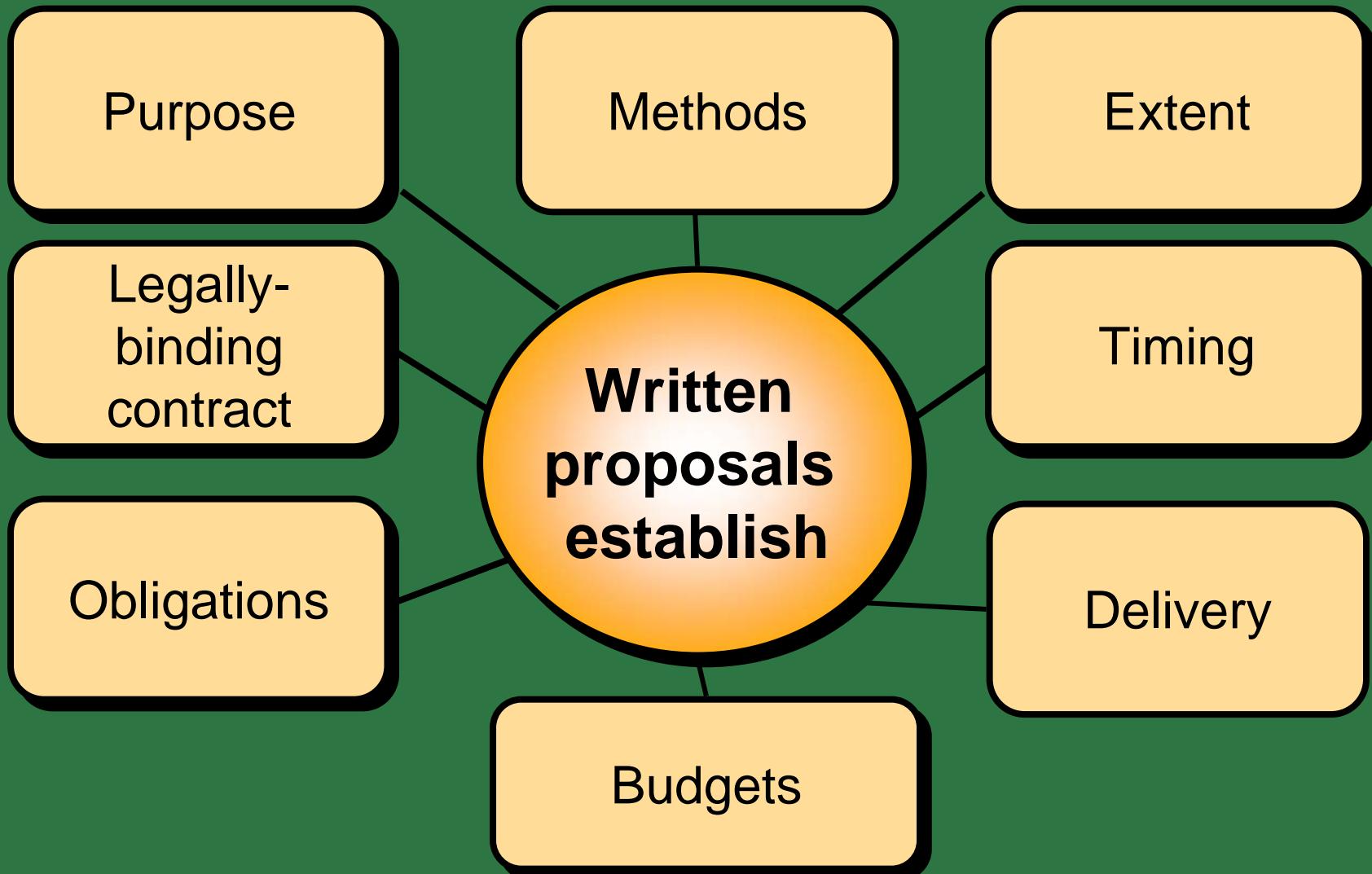
Stage 2: Proposing Research



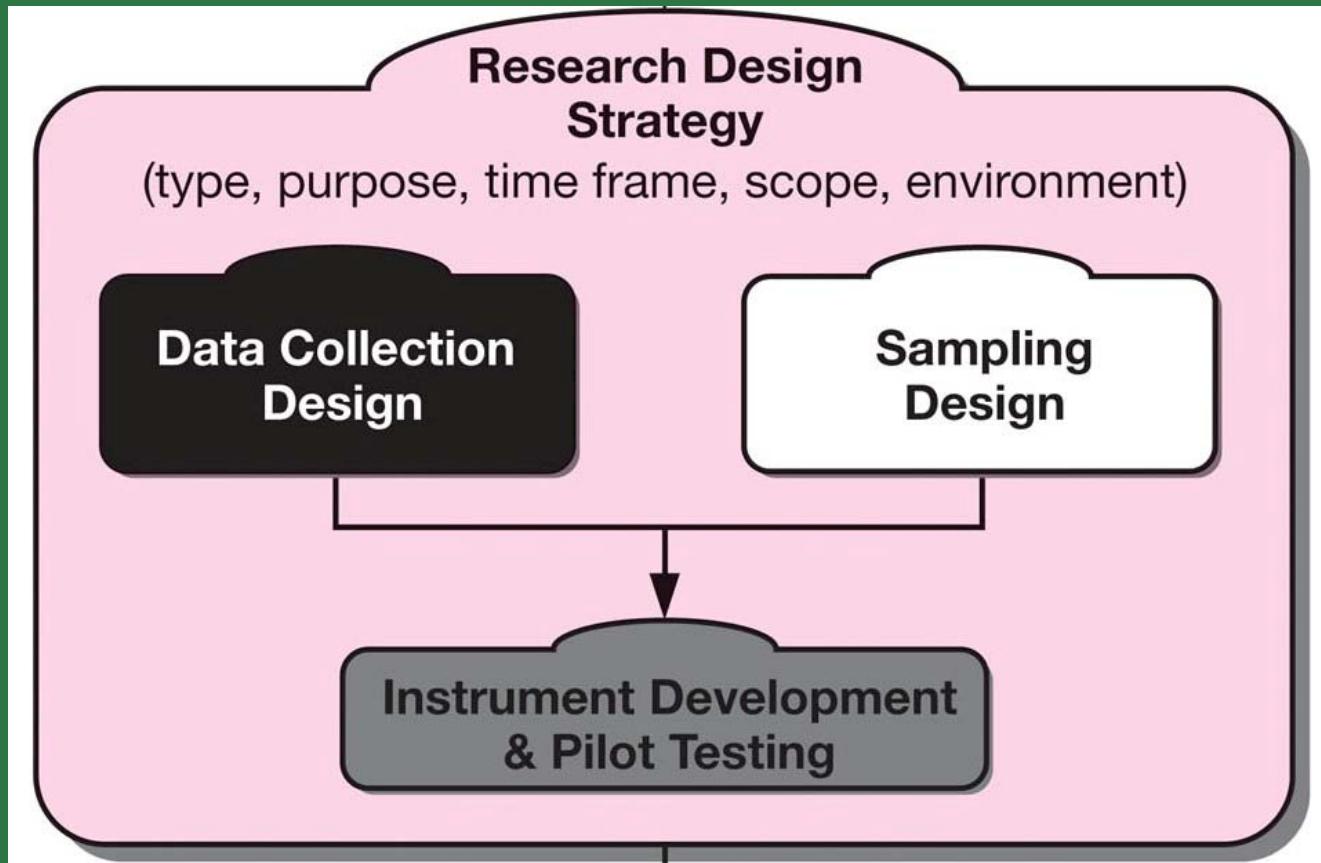
Budget Types

- Rule-of-thumb
- Departmental
- Task

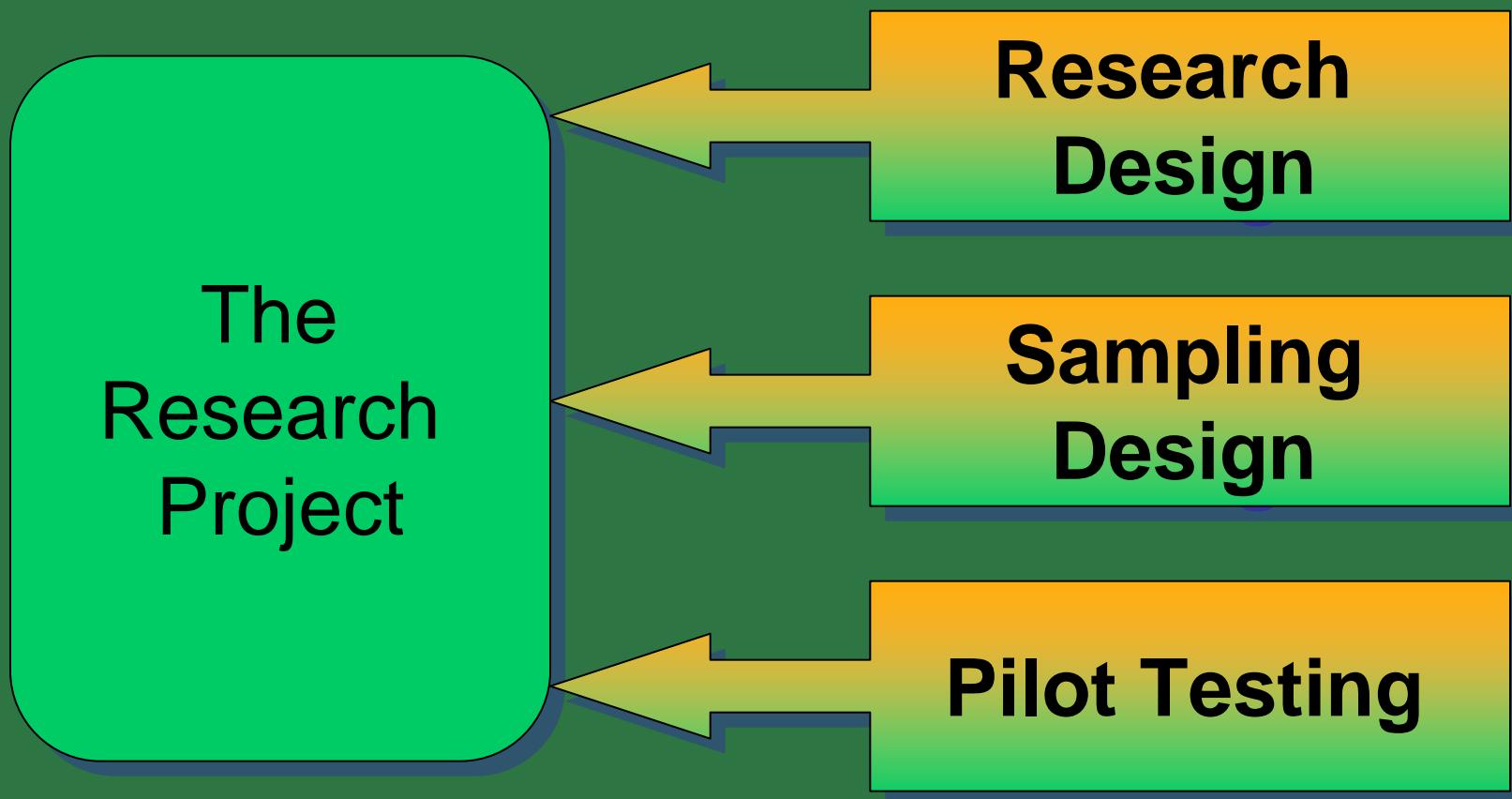
The Research Proposal



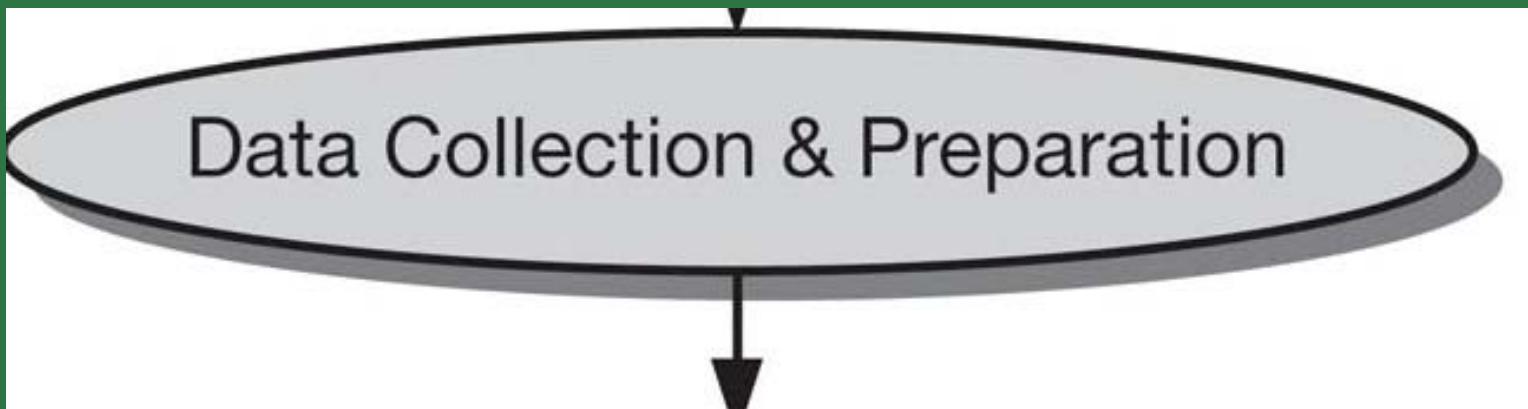
Stage 3: Research Design



Stage 3: Designing the Research



Stage 4: Data Collection



Collecting Sensitive Data Demands Safeguards

Scotts used a healthcare management company to collect sensitive wellness data during annual health assessments to preserve participant confidentiality.



Data Characteristics

- Abstractness
- Verifiability
- Elusiveness
- Closeness



Stage 5: Data Analysis and Interpretation

Data Analysis & Interpretation

Steps in Data Analysis and Interpretation



Reducing data to manageable size

Developing summaries

Looking for patterns

Applying statistical techniques

Stage 6: Reporting the Results



Parts of the Research Report



The Research Report Overview

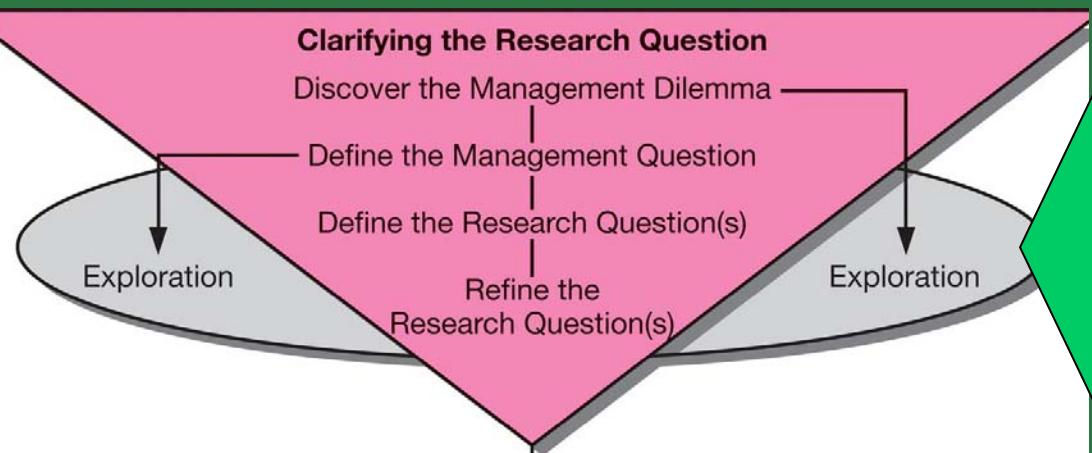
Problem's background

Summary of exploratory findings

Research design and procedures

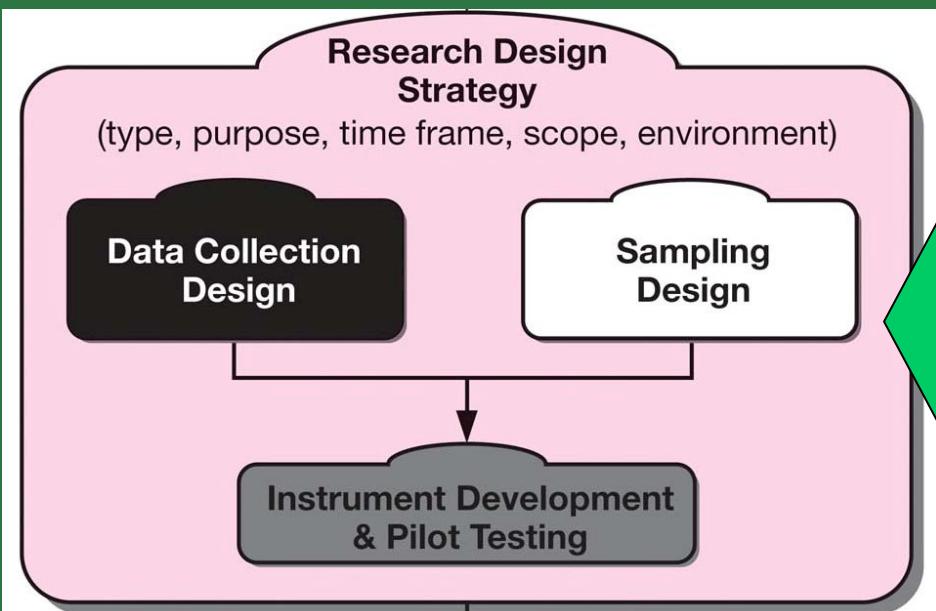
Conclusions

Research Process Problems to Avoid



- Ill-defined management problem
- Unresearchable questions
- Politically-motivated research

Research Process Problems to Avoid



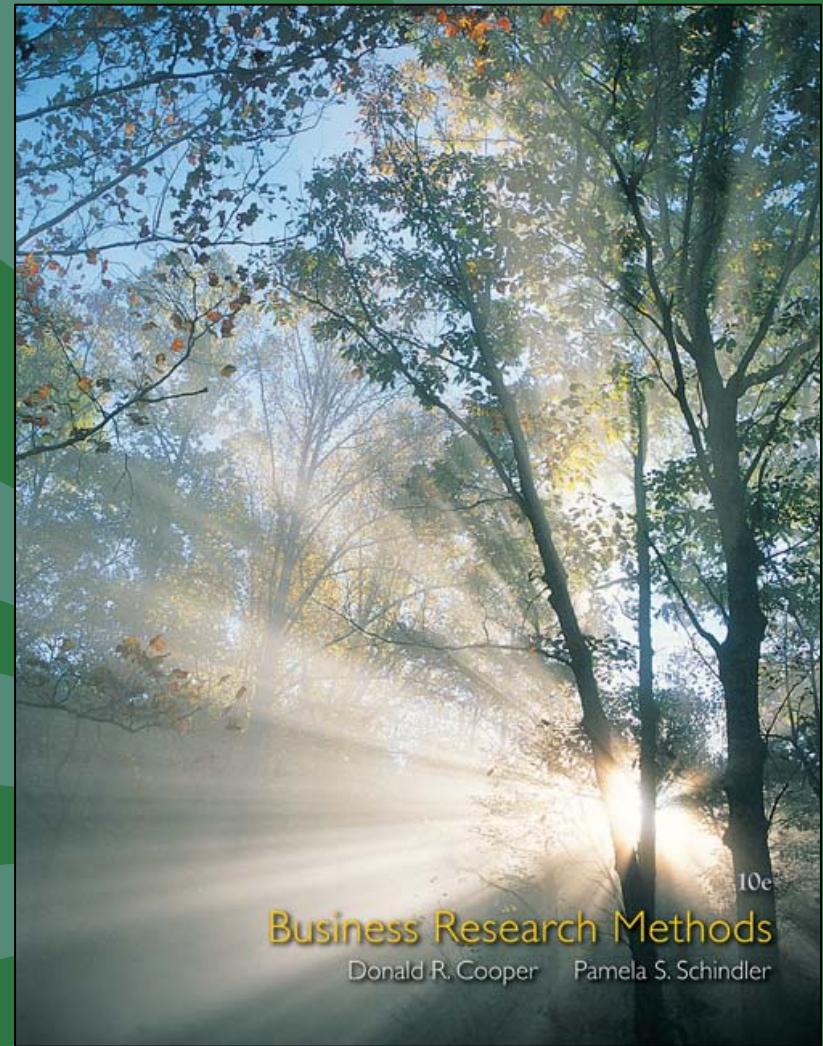
- Company Database Strip-Mining
- The Favored-Technique Syndrome

Key Terms

- Census
- Data
 - Primary data
 - Secondary data
- Data analysis
- Decision rule
- exploration
- Investigative questions
- Management dilemma
- Management question
- Management-research question hierarchy
- Pilot test
- Research design
- Research process
- Research questions
- Sample
- Target population

Chapter 5

Clarifying the Research Question through Secondary Data and Exploration





Learning Objectives

Understand...

- The purpose and process of exploratory research.
- The two types and three levels of management decision-related secondary sources.
- The five types of external information and the factors for evaluating the value of a source and its content.



Learning Objectives

Understand . . .

- The process of using exploratory research to understand the management dilemma and work through the stages of analysis necessary to formulate the research question (and, ultimately, investigative questions and measurement questions).
- What is involved in internal data mining and how internal data-mining techniques differ from literature searches.

PulsePoint: Research Revelation

19.4

The average annual percentage stock price increase experienced by high-employee-morale companies compared to others in their industry.



Clarifying the Research Question Reduces Information Overload

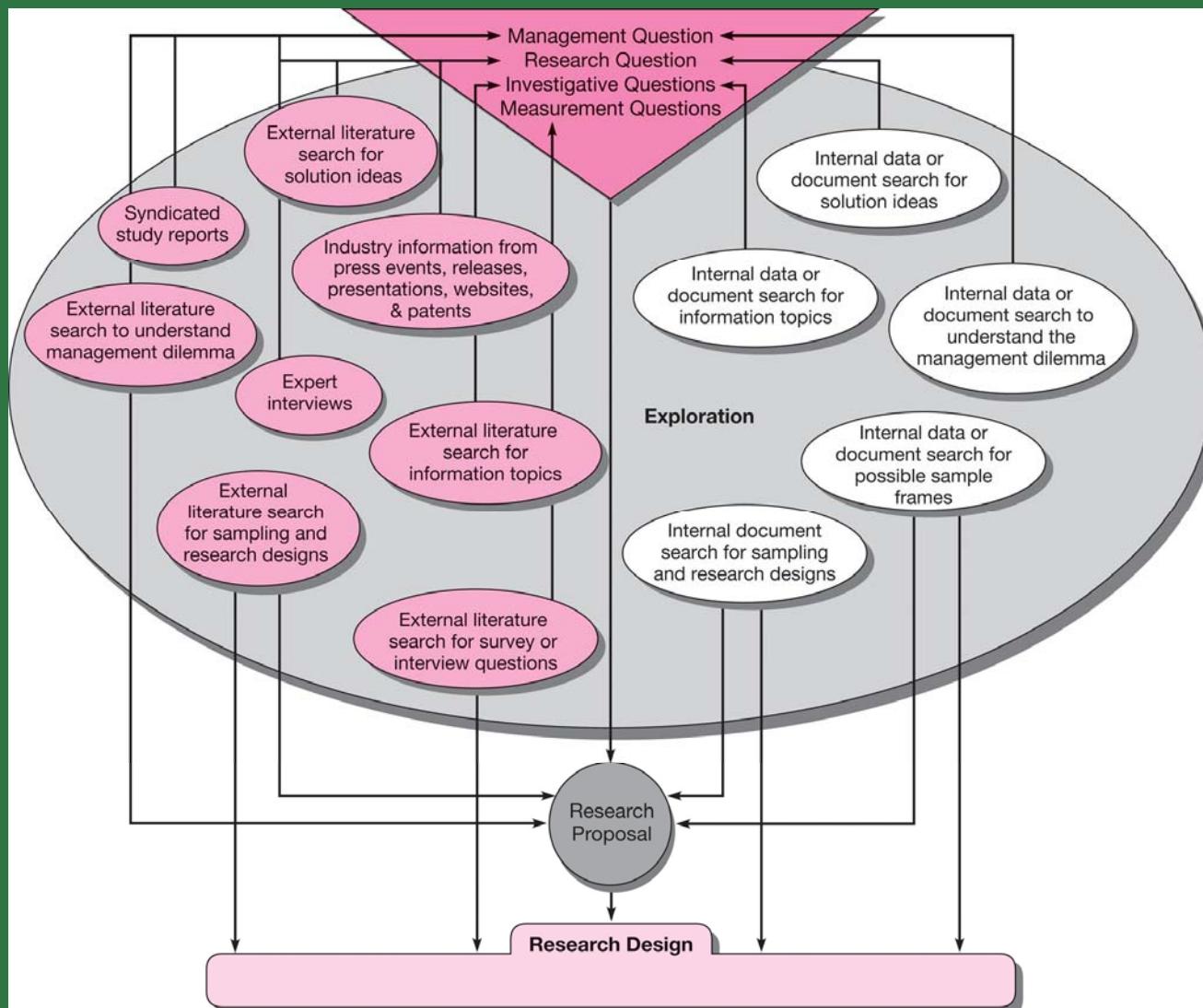
“Executives today are at risk of drowning in an ocean of technology-generated data. One possible response to data overload is to tune out completely, but that only takes the problem to the other extreme. A better response is to make the company’s business model as simple and as transparent as possible and to figure out exactly which measures are needed to illuminate the model’s success.”

*Robert J. Thomas, Executive Director,
Accenture’s Institute for High Performance Business*

Exploratory Phase Search Strategy



Integration of Secondary Data into the Research Process





Objectives of Secondary Searches

- Expand understanding of management dilemma
- Gather background information
- Identify information that should be gathered
- Identify sources for and actual questions that might be used
- Identify sources for and actual sample frames that might be used

Conducting a Literature Search

Define management dilemma

Consult books for relevant terms

Use terms to search

Locate/review secondary sources

Evaluate value of each source
and content



- Whiteboard technology makes the discussion of symptoms relevant to the management-research question hierarchy easier

Levels of Information

Primary Sources:

Memos
Letters
Interviews
Speeches
Laws
Internal records

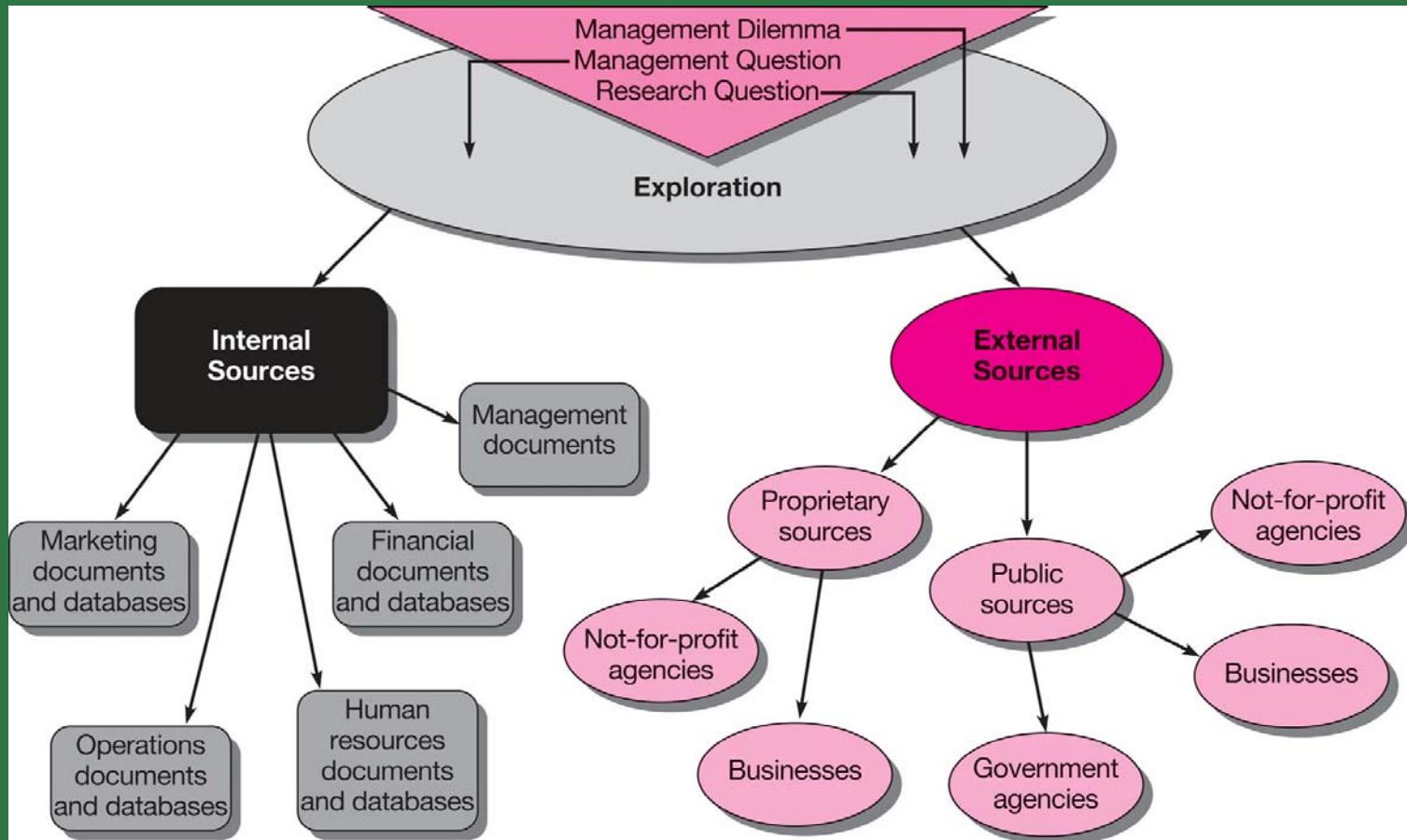
Secondary Sources:

Encyclopedias
Textbooks
Handbooks
Magazines
Newspapers
Newscasts

Tertiary Sources:

Indexes
Bibliographies
Internet
search engines

Integrating Secondary Data



The
U.S. Government
is the
world's largest
source of data

Find your birth certificate.
Buy surplus government property.
Send a Presidential birthday greeting.
Contact your representative in Congress.
Get a flag from the Capitol. Protect your privacy.
Buy a Treasury note. See about an FHA mortgage.
Enlist in the military. Check on safe travel abroad.
Start a small business. Get info on immigration laws.
File for Social Security.
Check postage rates.
Find military personnel.
Get help on tax issues.
Reserve a campsite.
Buy Savings Bonds.
Find a Federal job.
Get your passport.
Visit a national park.
Apply for a gov't grant.
Report unsafe products.
Trace your family tree.
Register a trademark.
Get Medicare benefits.
Write the President.
Plan for college.
Buy a HUD home.
File your taxes.
Fly the U.S. flag.

Get the answers you can trust from the Federal Consumer Information Center. You've written to our Pueblo, CO address for years. Now you can call us toll-free for answers to your questions about all kinds of federal government programs, benefits and services.

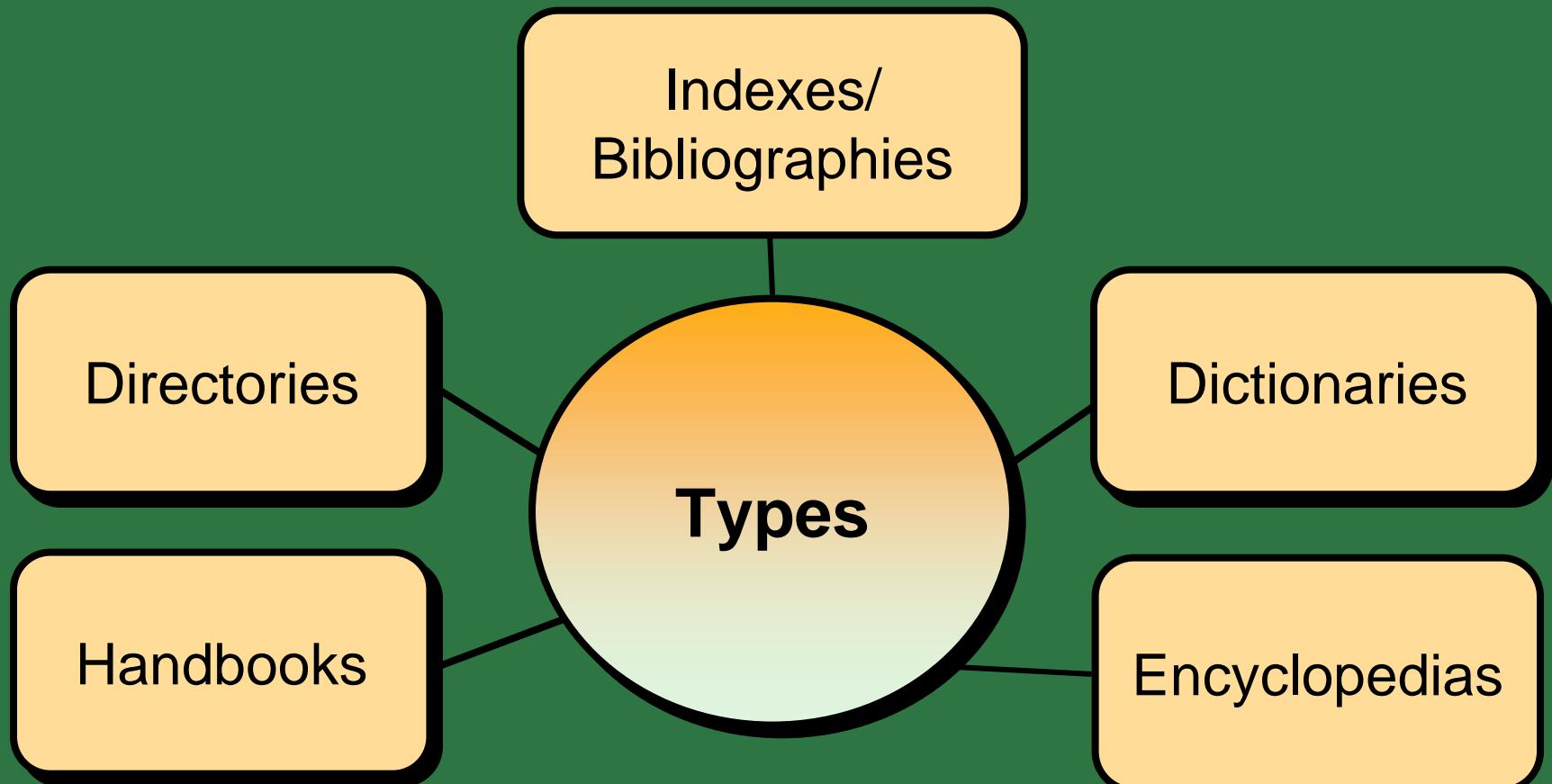


We'll answer your questions directly or get you to the person who can. Recorded information is also available around the clock.

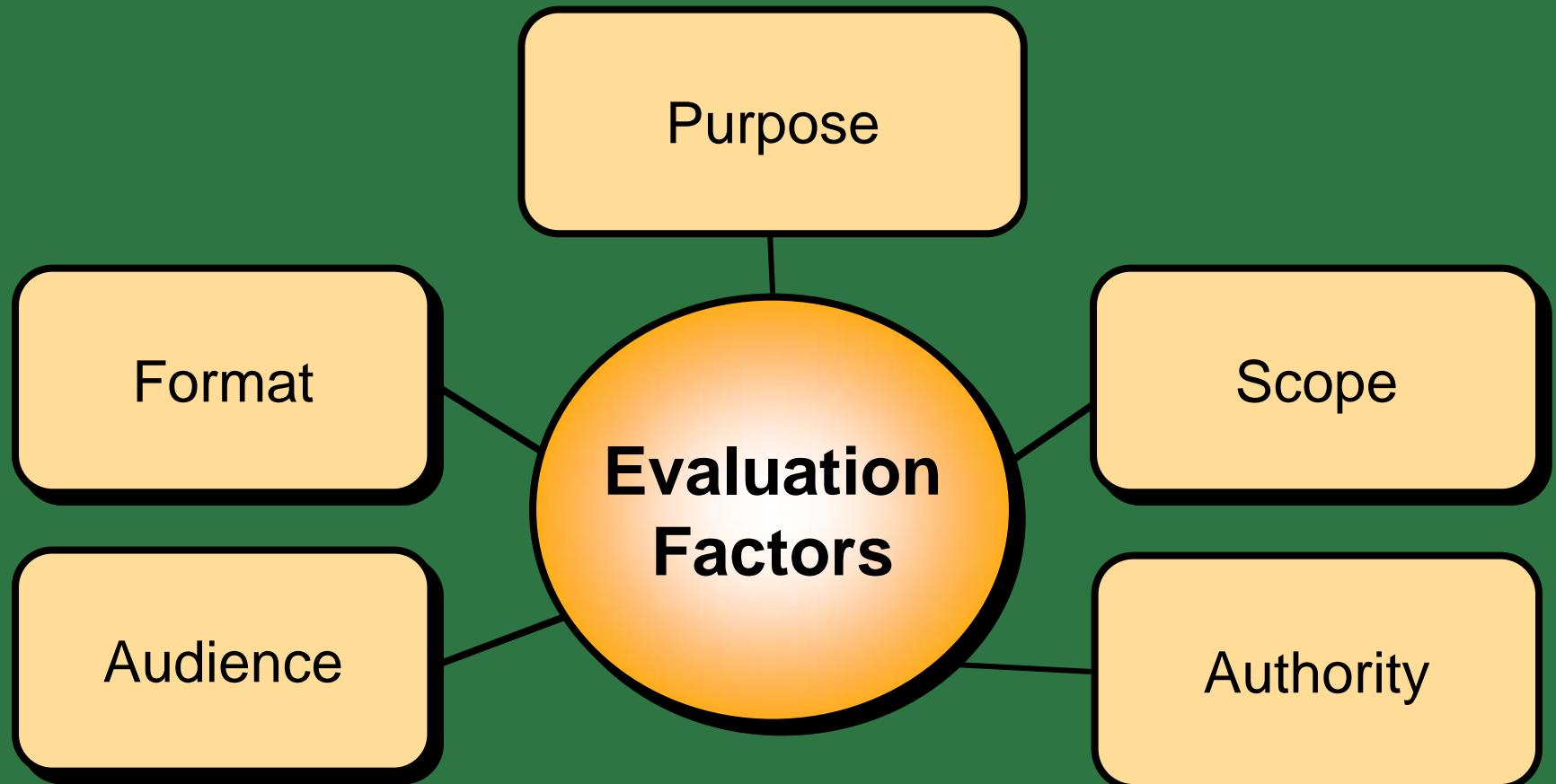
Now the only question left is how to reach us. Simple. Just call toll-free:

1-800-FED-INFO
(That's 1-800-333-4636)
Monday through Friday 8 a.m. to 8 p.m. Eastern Time
or visit www.pueblo.gsa.gov/call

Information Sources



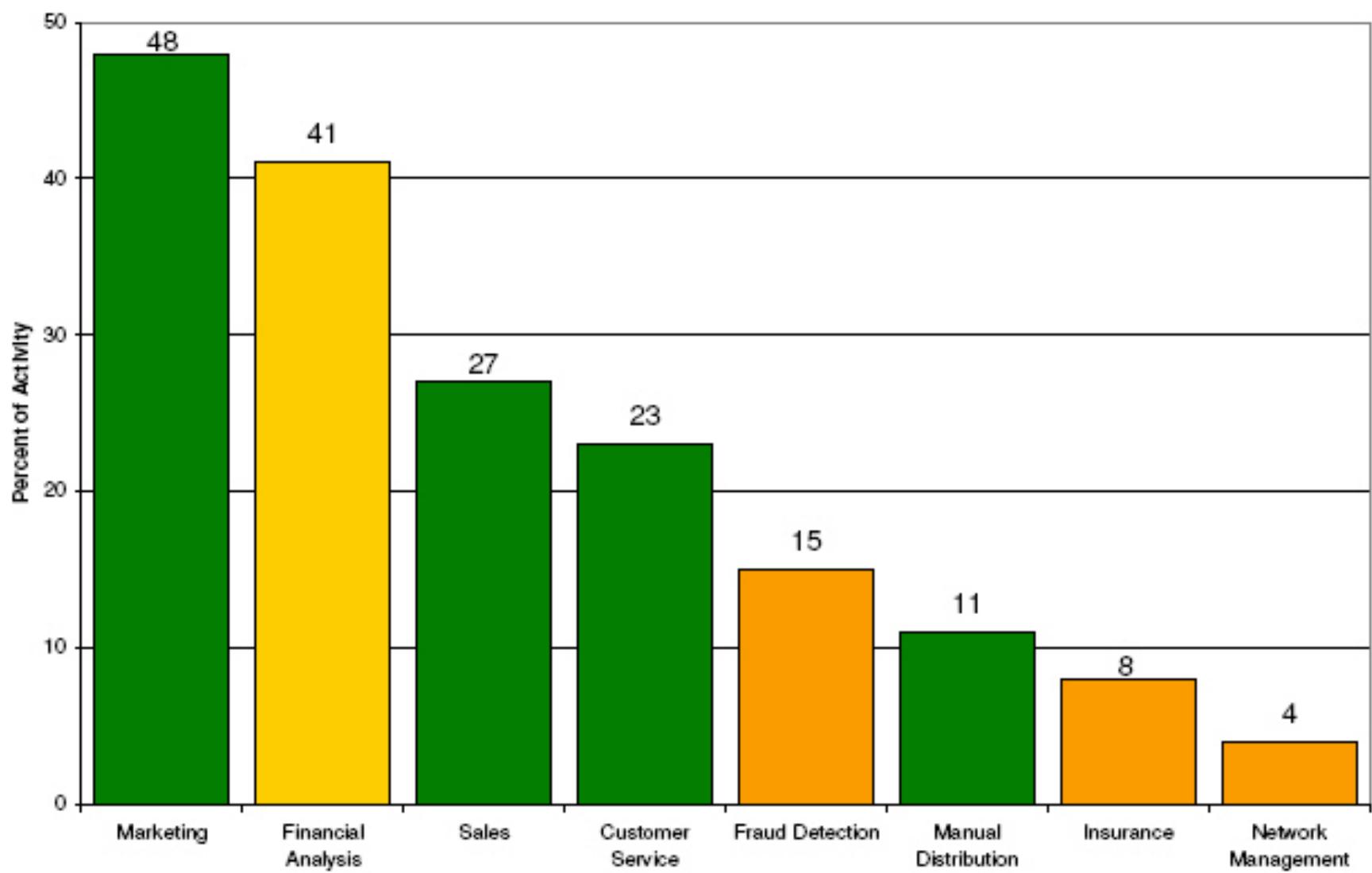
Evaluating Information Sources



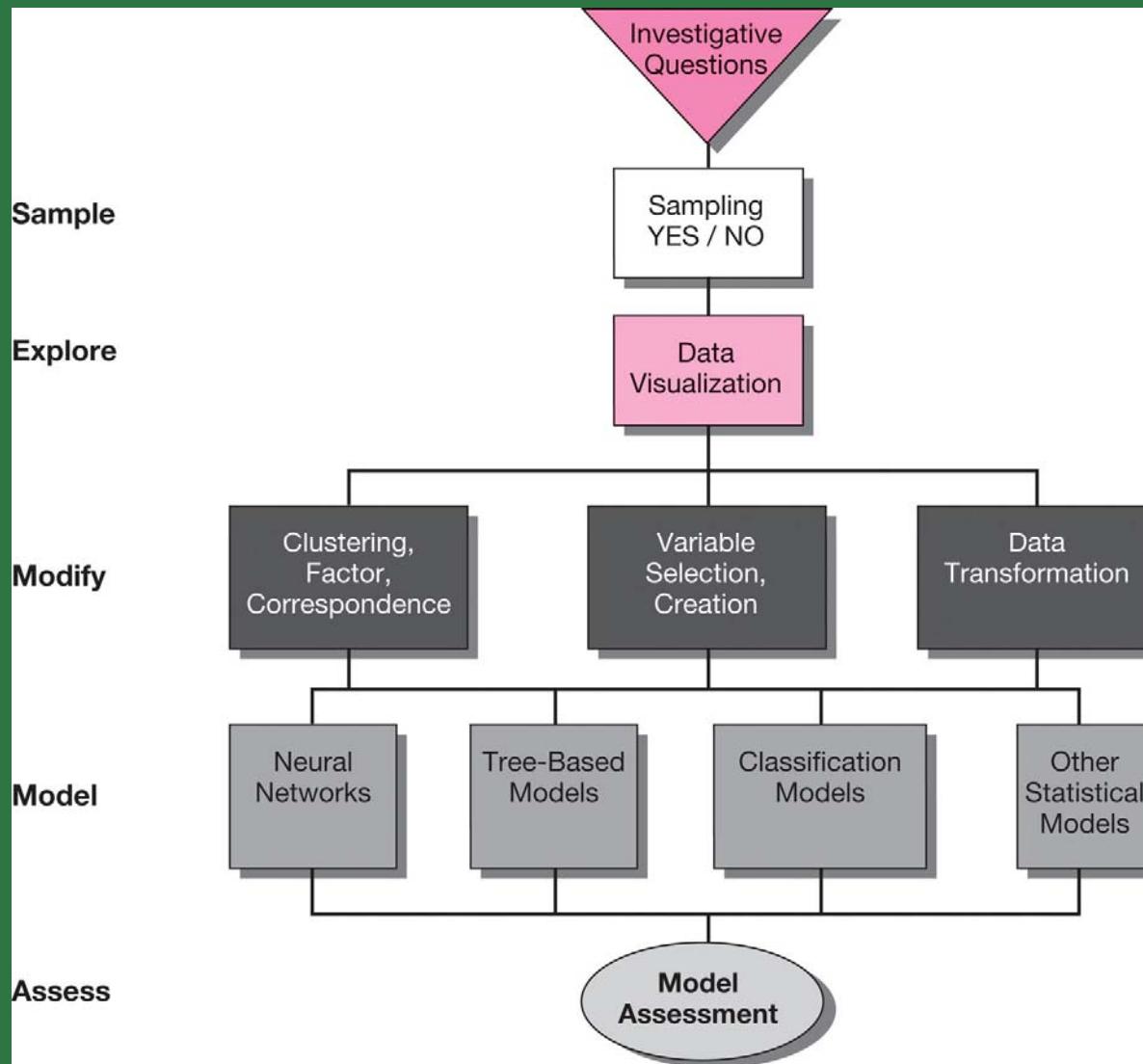
The Evolution of Data Mining

Evolutionary Step	Investigative Question	Enabling Technologies	Characteristics
Data collection (1960s)	“What was my average total revenue over the last five years?”	Computers, tapes, disks	Retrospective, static data delivery
Data access (1980s)	“What were unit sales in California last December?”	Relational databases (RDBMS), structured query language (SQL), ODBC	Retrospective, dynamic data delivery at record level
Data navigation (1990s)	“What were unit sales in California last December? Drill down to Sacramento.”	Online analytic processing (OLAP), multidimensional databases, data warehouses	Retrospective, dynamic data delivery at multiple levels
Data mining (2000)	“What’s likely to happen to Sacramento unit sales next month? Why?”	Advanced algorithms, multiprocessor computers, massive databases	Prospective, proactive information delivery

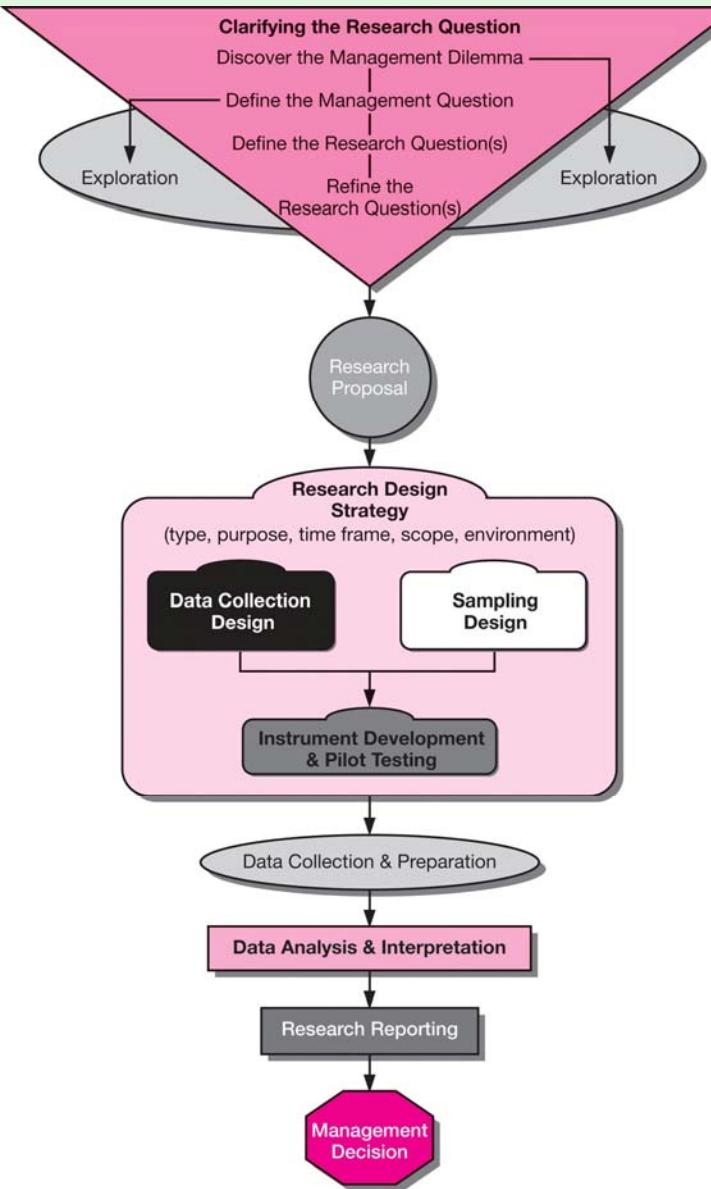
Data Mining in Business



Data-Mining Process



The Business Research Process

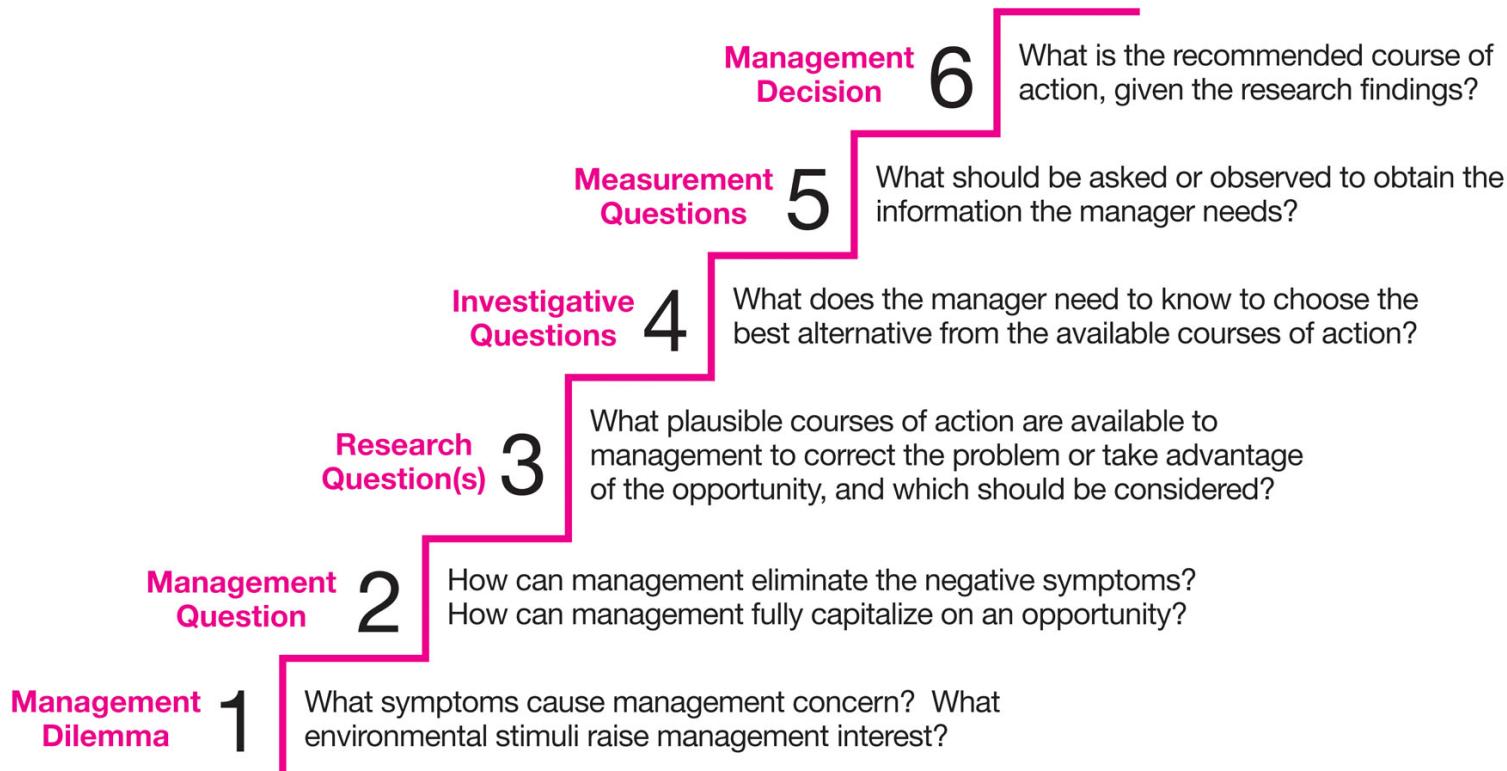


Stage 1: Clarifying the Research Question



Management-research question hierarchy process begins by identifying the management dilemma

Management-Research Question Hierarchy



SalePro's Hierarchy

1

Why are our sales declining in the South and Northeast, while sales are booming in the Southwest?

2

How can we improve sales in the South and Northeast?

3

Should we introduce a 2 percent incentive commission-based compensation system on all sales over quota for salespeople in the South and Northeast or a 5-percent-of-profit regional bonus to the region that increases sales by 10 percent over quota (to be shared proportionately among the salespeople in the region)? Should we modify the product formula for distribution in the South and Northeast? Should we increase the level of advertising via trade publications in South and Northeast editions?

4

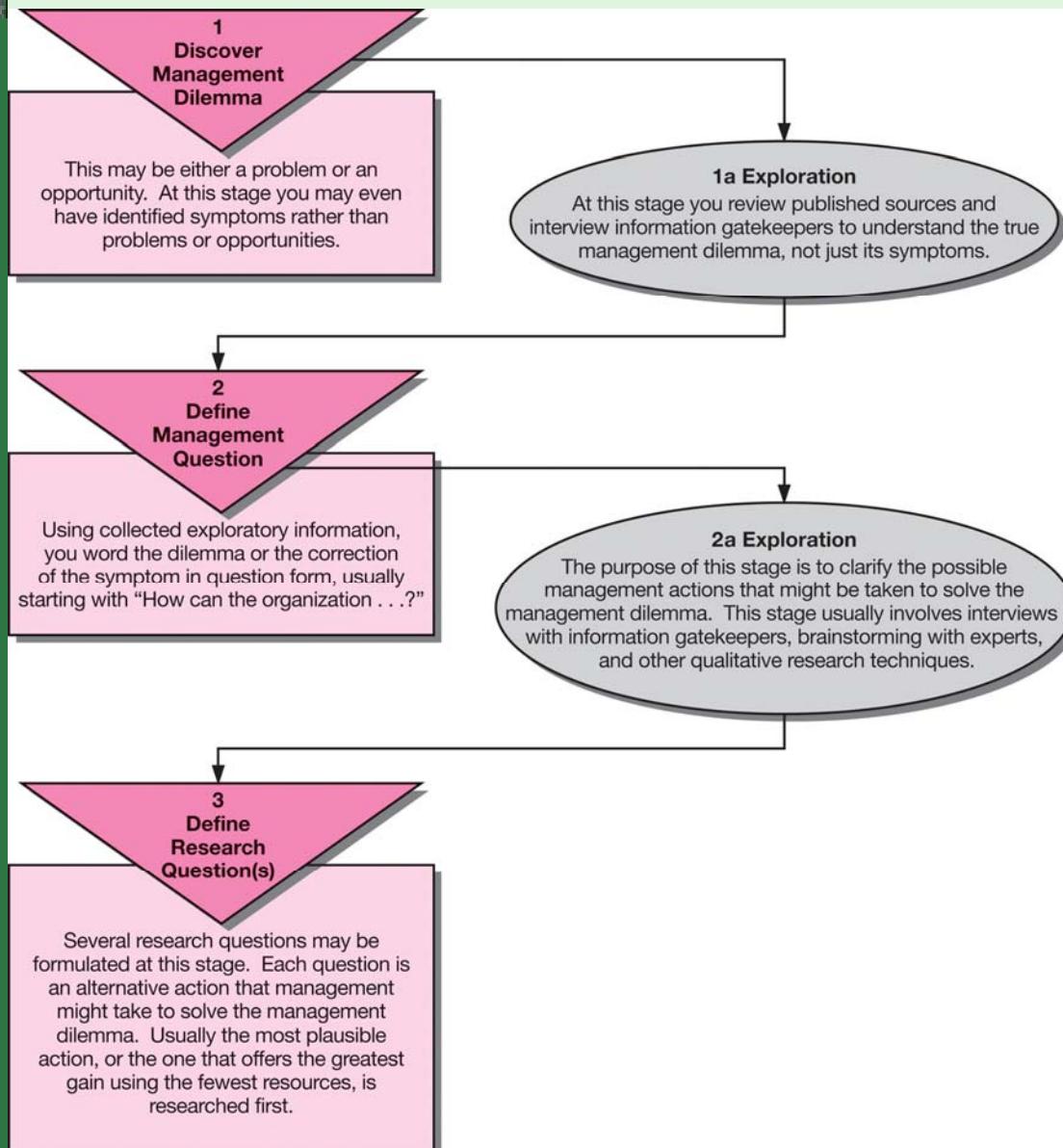
What is the likelihood that we will lose excellent salespeople in the South and Northeast if we implement the compensation change? What is the likelihood that current customer satisfaction in these regions will decrease? What is the likelihood that future sales to existing customers will be lost?

5

Please rate your level of concern for each of the following outcomes if management were to change your compensation to a commission-based system compared to the current salary system. For each outcome, indicate a number between 1 and 7 where 7 = extreme concern, 4 = neither concerned nor unconcerned, and 1 = no concern at all.

- Lack of predictability of monthly pay.
- Increased internal competition for sales prospects.
- Reduced time for postsale servicing of customer needs.
- Reduced incentive for postsale servicing of customer needs.

Formulating the Research Question



Types of Management Questions

Categories	General Question	Sample Management Questions
Choice of Purpose or Choice of Objectives	<ul style="list-style-type: none"> • What do we want to achieve? 	<ul style="list-style-type: none"> • Should we reposition brand X as a therapeutic product from its current cosmetic positioning? • What goals should XYZ try to achieve in its next round of distributor negotiations?
Generalization and Evaluation of Solutions <small>(choices between concrete actions to solve problems or take advantage of opportunities)</small>	<ul style="list-style-type: none"> • How can we achieve the ends that we seek? 	<ul style="list-style-type: none"> • How can we achieve our 5-year goal of doubling sales and profits? • What should be done to improve the CompleteCare program for product repairs and servicing?
Troubleshooting or Control <small>(monitoring or diagnosing ways an organization is failing to meet its goals)</small>	<ul style="list-style-type: none"> • How well is our marketing program meeting its goals? • Why is our marketing program not meeting its goals? 	<ul style="list-style-type: none"> • What is our product line's sales-to-promotion cost ratio? • Why does our department have the lowest sales-to-Web page visit ratio? • Why does our product line have the lowest off-shelf display occasions in the industry?

The Research Question

Examine variables

Determine necessary evidence

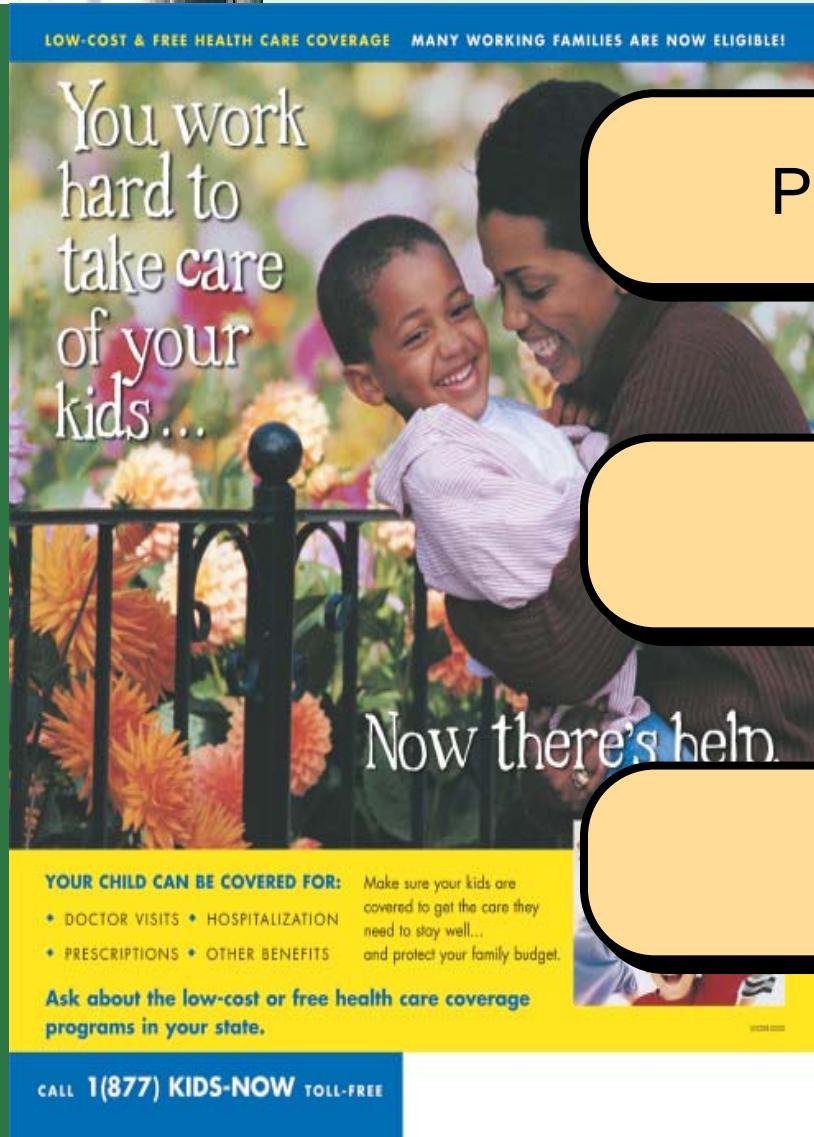
Fine-Tuning

Break questions down

Set scope of study

Evaluate hypotheses

Investigative Questions



Performance Considerations

Attitudinal Issues

Behavioral Issues

- Harris Interactive answers “Why?” for its research clients



Why?

Because he thinks plaid is slimming. Because the chain makes him feel young again. Because he believes the world needs more purple.

You might not understand this guy. But you will.

Contact the Harris Interactive Qualitative Research Practice at **877.919.4765**. *We'll explore him together.*

To learn more, check out our free Online Demo at
www.harrisinteractive.com/qual

 **HarrisInteractive**
MARKET RESEARCH
The Harris Poll® PEOPLE

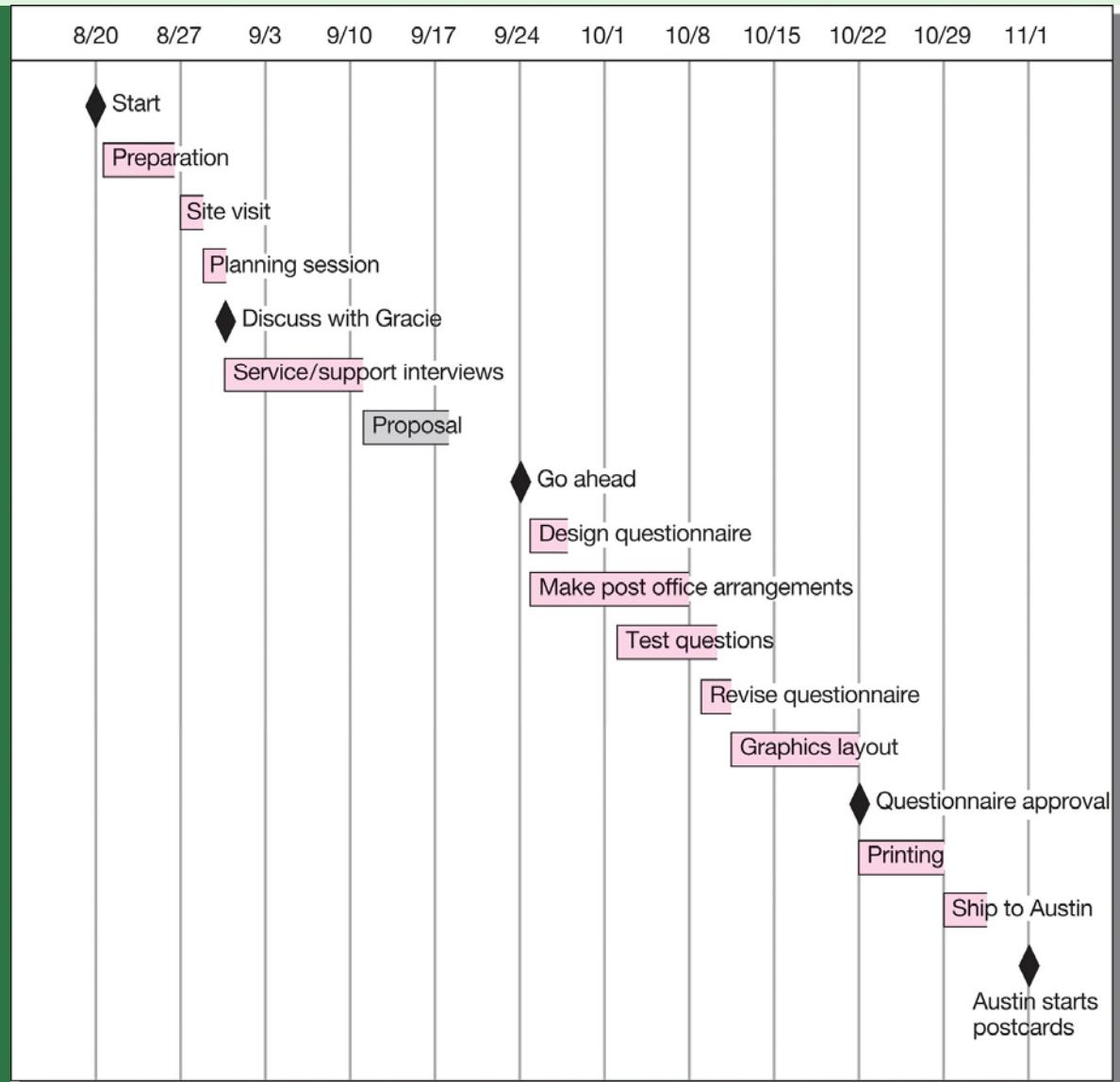


www.harrisinteractive.com Tel 877.919.4765

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Gantt Chart

MindWriter Project Plan

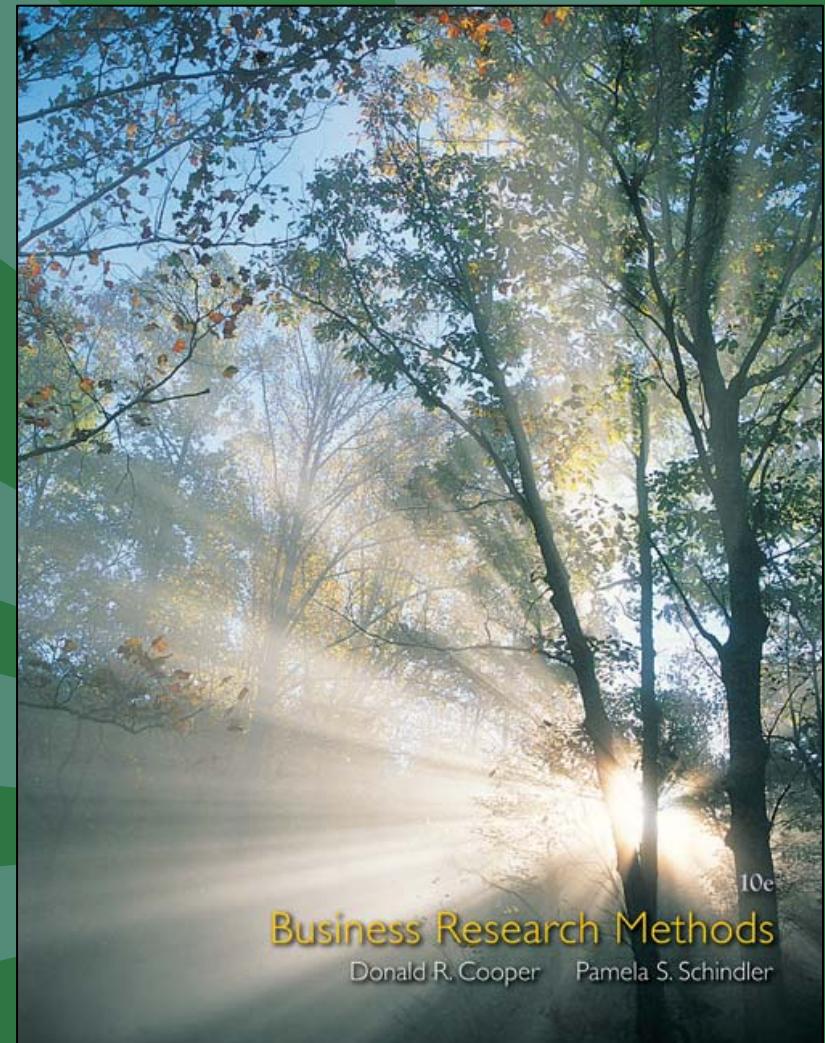


Key Terms

- Bibliography
- Bibliographic Database
- Data Mart
- Data Mining
- Data Visualization
- Data Warehouse
- Dictionary
- Directory
- Encyclopedia
- Expert interview
- Exploratory research
- Handbook
- Index
- Individual depth interview
- Investigative questions
- Literature search
- Management question
- Measurement question
 - Custom-designed
 - Predesigned
- Primary sources
- Research questions
- Secondary sources
- Source evaluation
 - Purpose
 - Scope
 - Authority
 - Audience
 - Format
- Tertiary sources

Appendices 5a & 5b

Bibliographic Database Searches/ Advanced Searches



Searching Databases vs. the Web

Bibliographic Search Process	Web Search Process
1. Select a database appropriate for your topic.	1. Select a search engine or directory.
	2. Determine your search options.
2. Construct a search query. <ul style="list-style-type: none">• Review and evaluate search results.• Modify the search query, if necessary.	3. Construct a search query. <ul style="list-style-type: none">• Review and evaluate search results.• Modify the search query, if necessary.
3. Save those valuable results of your search.	4. Save those valuable results of your search.
4. Retrieve articles not available in the database.	
5. Supplement your results with information from Web sources.	5. Supplement your results with information from non-Web sources.

Advanced Searching Process

Step 1: Build a list of synonyms for each concept in the management question.

Concept A	Operator	Concept B	Operator	Concept C
training	AND	sex* harassment	AND	lawsuit
awareness		wom*n		law
behavior		female		courts
professional		gender		legal
development		men		

Step 2: Create and search with a concept group by combining each term in a column with **OR**. Put each concept group in parentheses. Then combine each concept group with **AND**.

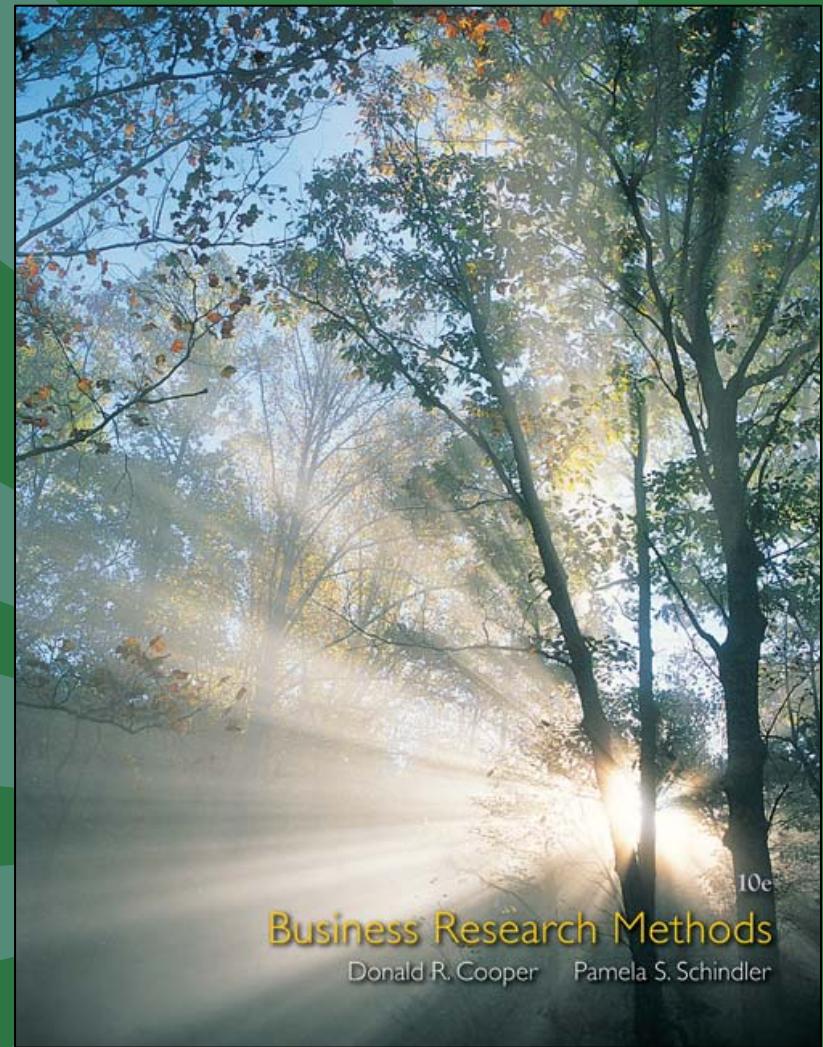
(training OR awareness OR behavior OR professional development) AND (sex* harassment OR wom*n OR men OR female OR gender) AND (lawsuit OR legal OR law OR courts)

Review of Advanced Search Options

Expanding Your Search		Narrowing Your Search
OR	AND	Phrases
<p>Use OR to search for plurals, synonyms, or spelling variations. Either or both terms will be present in results.</p> <ul style="list-style-type: none">• woman OR women• business OR corporation• international OR foreign	<p>Use AND to require that all terms you specify be present in the results.</p> <ul style="list-style-type: none">• child AND advertising	<p>Use a term consisting of two or more words. Some phrases require double quotes to enclose the phrase, while others do not.</p> <ul style="list-style-type: none">• human resource management• “human resource management”
Truncation	NOT	ADJ
<p>Symbols (?, *, !) that replace one or more characters or letters in a word or at the end of a word.</p> <ul style="list-style-type: none">• electr* (retrieves electricity, electric, electrical)• child? (retrieves children, childish, child's)	<p>Use NOT to eliminate terms from your search. But use NOT with care. It is easy to eliminate the good with the unwanted.</p> <ul style="list-style-type: none">• medicine NOT nursing• Caribbean NOT Cuba	<p>ADJ requires the first term specified to immediately precede the last term specified.</p> <ul style="list-style-type: none">• six ADJ sigma
Limiters		Conditions (date , publication type , language) for limiting your search. Most databases also offer <i>field limiting</i> , limiting the occurrences of your search to a specific database field, such as the author field, title, etc. Some bibliographic databases offer the convenience of limiting the search results to peer-reviewed articles or to articles only available in full text. Use the latter with care as some significant articles may be overlooked even though they are available in the library.

Chapter 6

Research Design: An Overview





Learning Objectives

Understand . . .

- The basic stages of research design.
- The major descriptors of research design.
- The major types of research designs.
- The relationships that exist between variables in research design and the steps for evaluating those relationships.

PulsePoint: Research Revelation

95

The millions of Americans actively text messaging, according to Yankee Group.

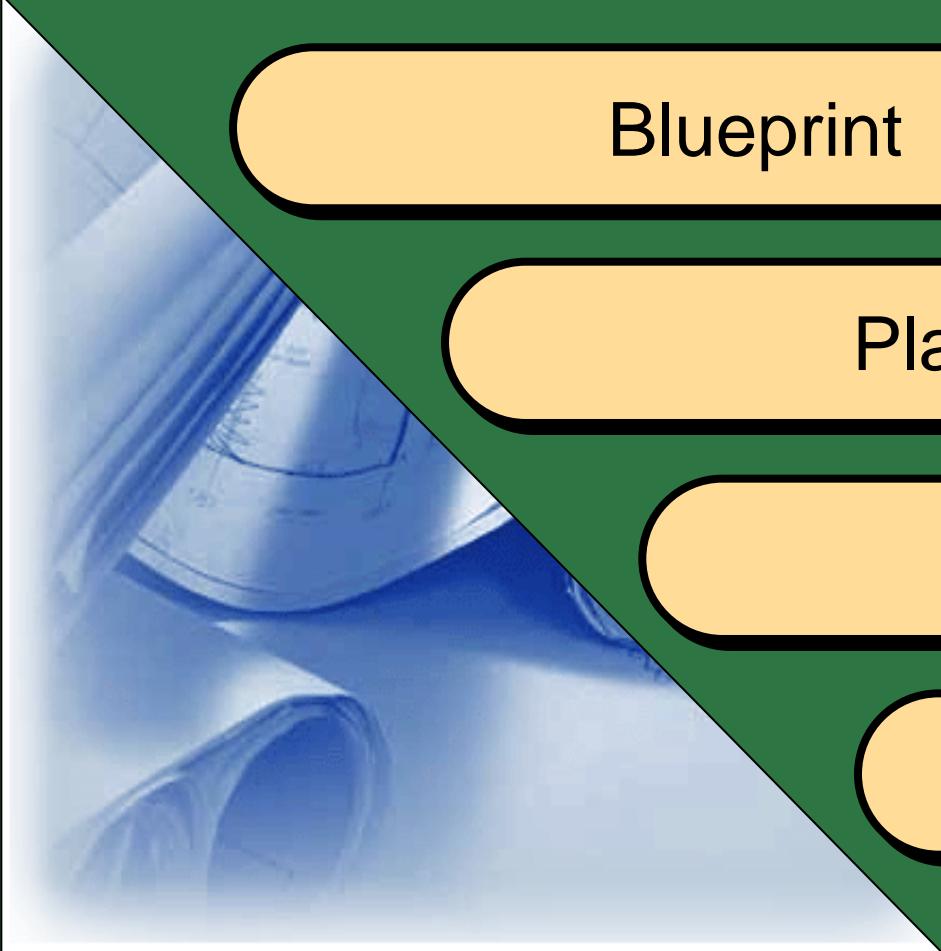


Fit the Design to the Information

“Polls and focus groups do a good job on issues where people have made up their minds, but there are a number of gridlock issues laden with complex trade-offs that people haven’t thought out.”

*Daniel Yankelovich, author and founder,
Yankelovich, Skelly and White*

What Is Research Design?

A faint background image of architectural blueprints, showing various lines, shapes, and text, is visible through a white diagonal banner.

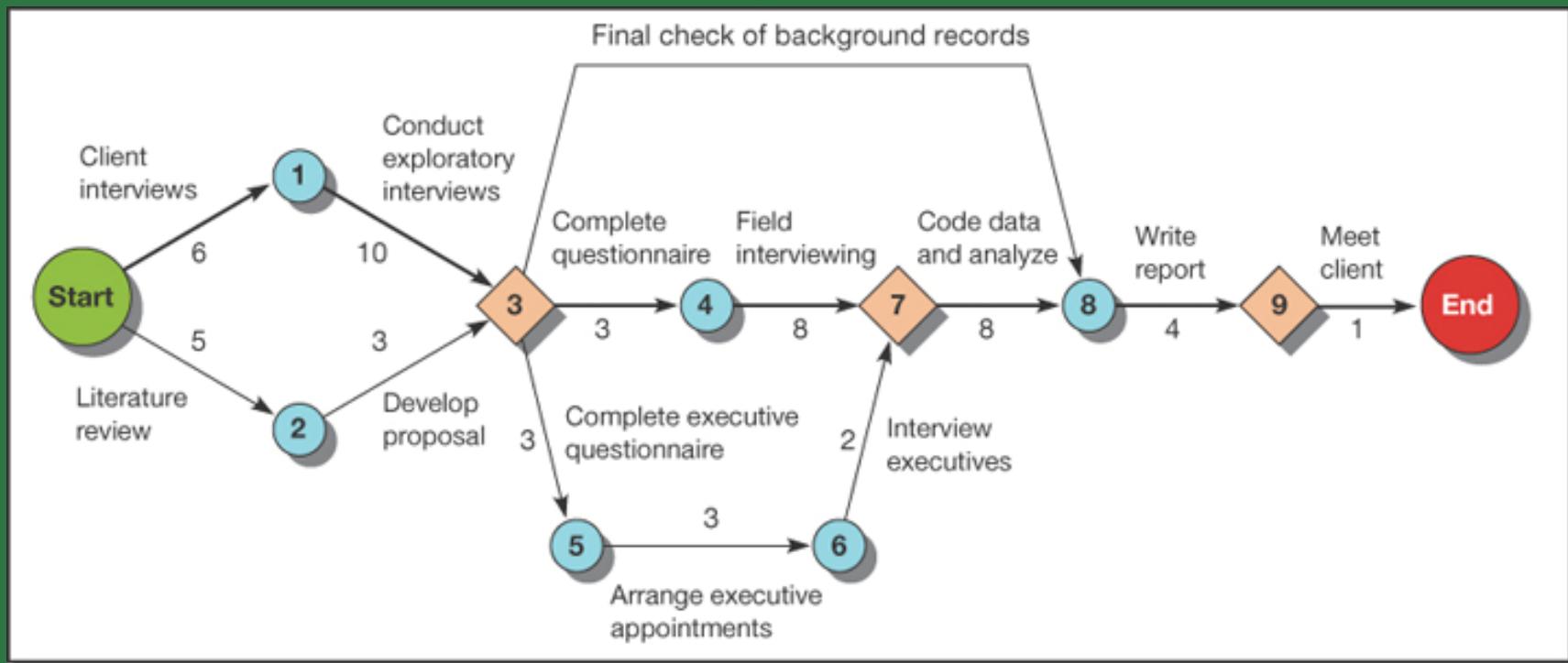
Blueprint

Plan

Guide

Framework

What Tools Are Used in Designing Research?

**Milestones:**

- 3 Proposal approval
- 7 Interviews completed
- 9 Final report completed

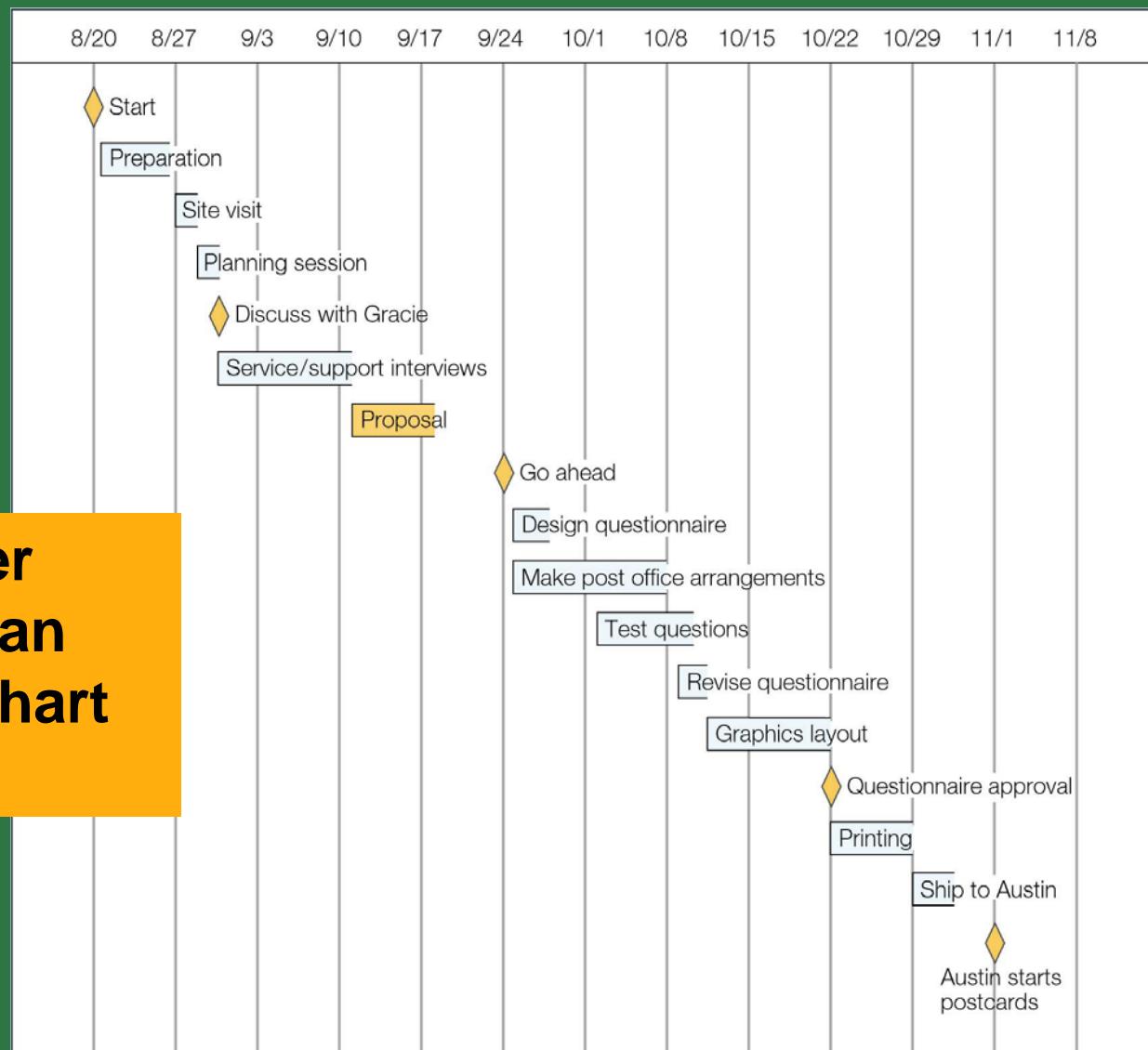
Critical Path:

S-1-3-4-7-8-9-E

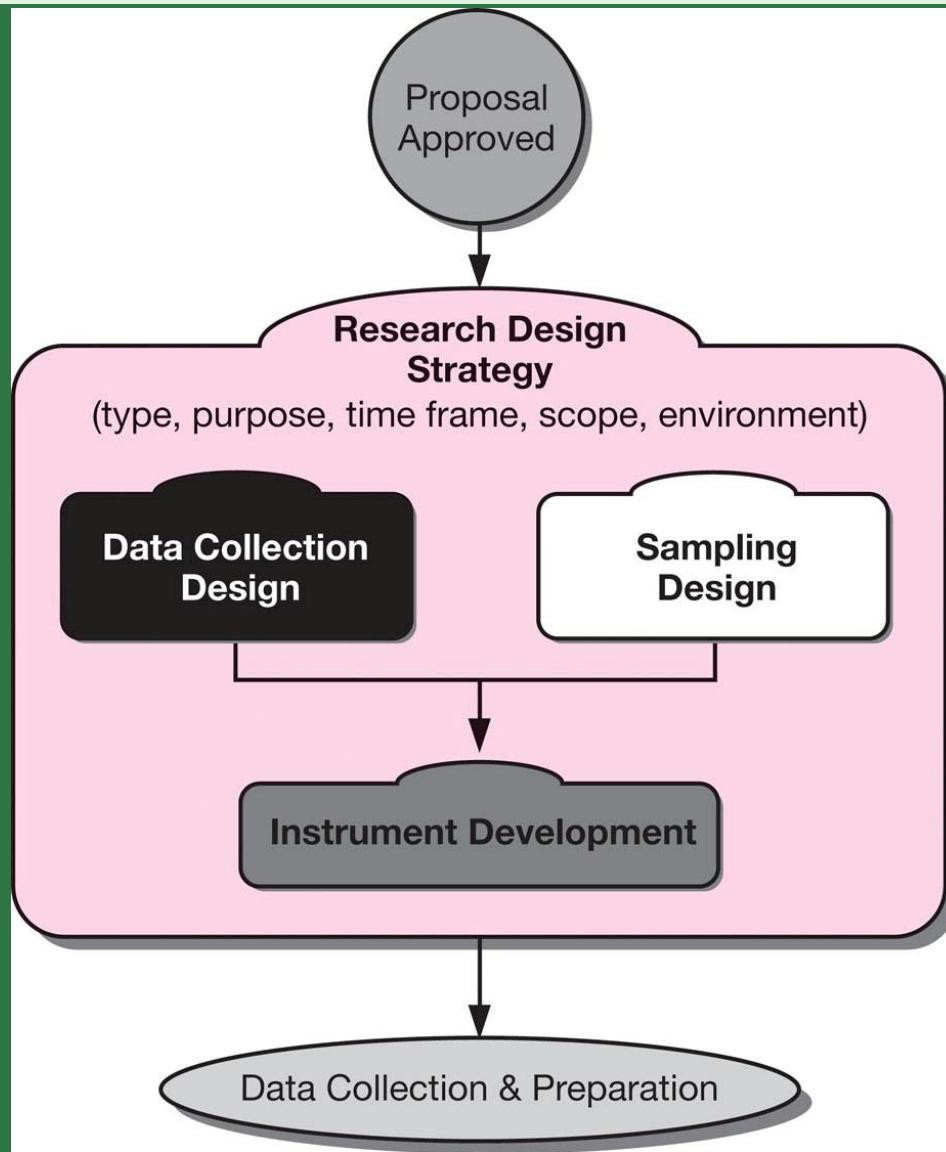
Time to Completion:

40 working days

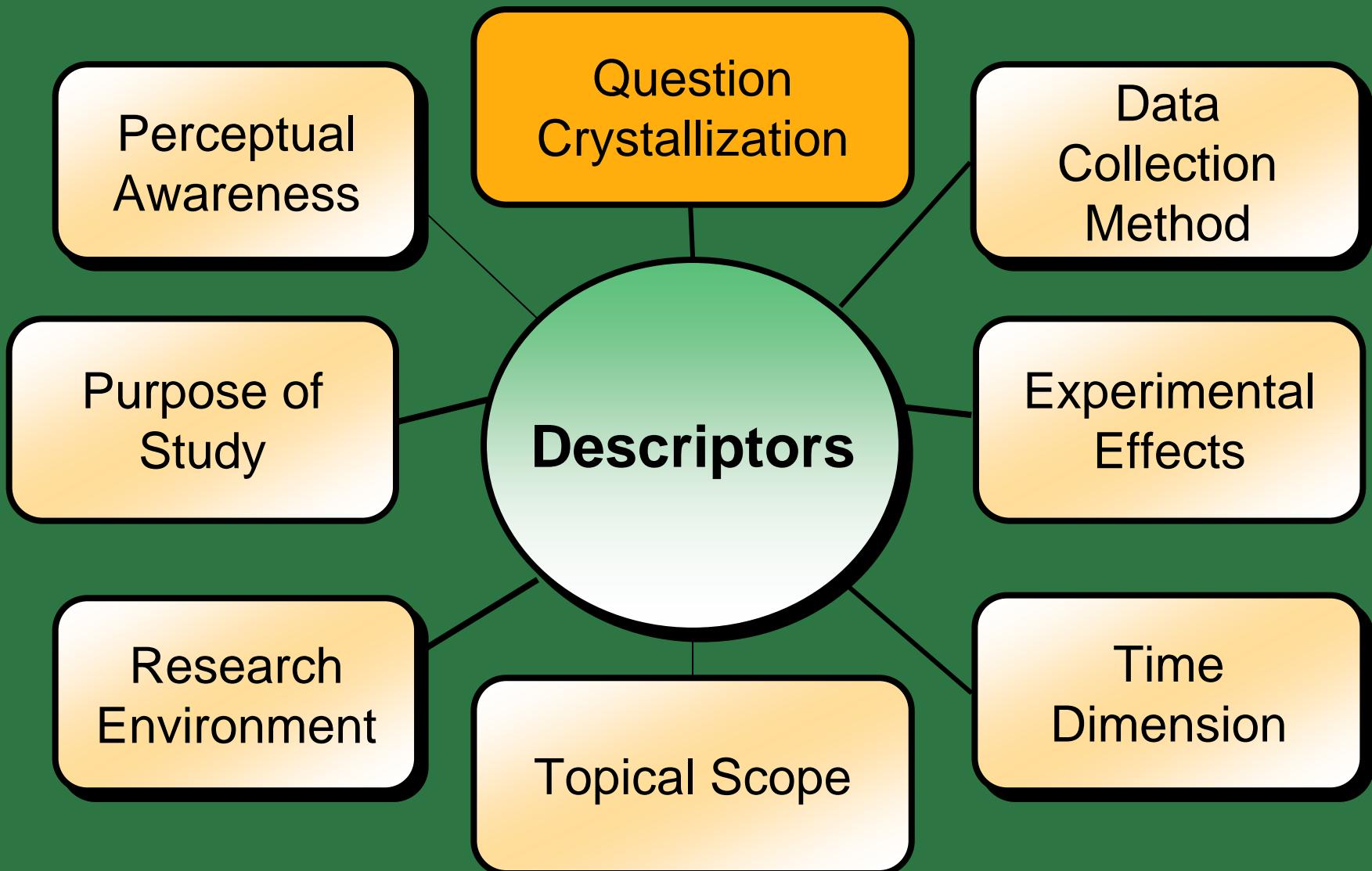
What Tools Are Used in Designing Research?



Design in the Research Process



Descriptors of Research Design



Degree of Question Crystallization

Exploratory Study

- Loose structure
- Expand understanding
- Provide insight
- Develop hypotheses

Formal Study

- Precise procedures
- Begins with hypotheses
- Answers research questions

Approaches for Exploratory Investigations

- Participant observation
- Film, photographs
- Projective techniques
- Psychological testing
- Case studies
- Ethnography
- Expert interviews
- Document analysis
- Proxemics and Kinesics



Desired Outcomes of Exploratory Studies



Established range and scope of possible management decisions

Established major dimensions of research task

Defined a set of subsidiary questions that can guide research design

Desired Outcomes of Exploratory Studies (cont.)



Developed hypotheses about possible causes of management dilemma

Learned which hypotheses can be safely ignored

Concluded additional research is not needed or not feasible

Commonly Used Exploratory Techniques

Secondary
Data Analysis

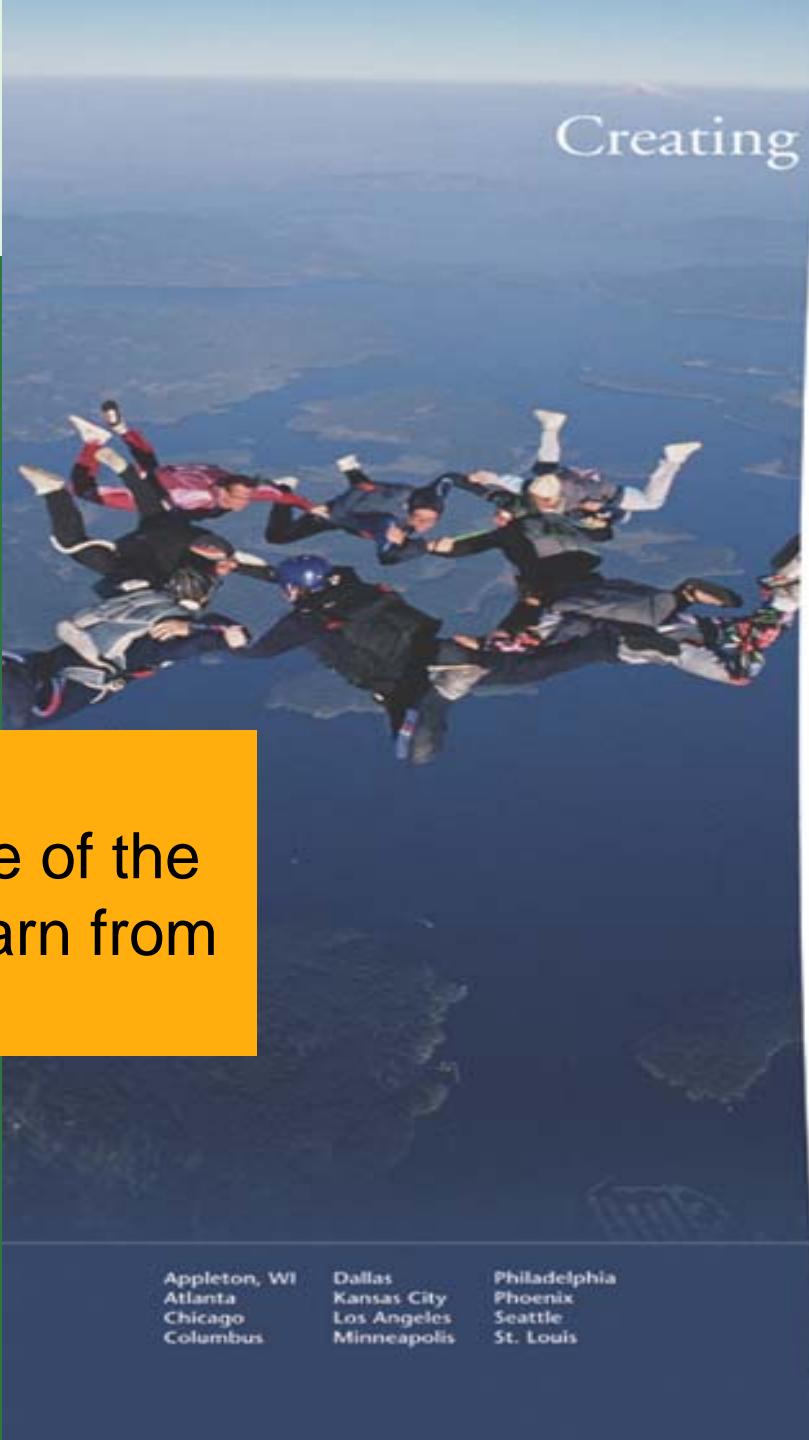
Experience
Surveys

Focus
Groups





Face-to-face
interaction—one of the
best ways to learn from
participants.



Creating Connections

In this high-tech world, it's easy to forget that face-to-face interaction is still one of the best ways to learn about people's experiences and impressions. Even though technology is playing an increasing role in data collection, we know it will never replace direct conversations with customers in a focus group setting.

At Delve, we help you find creative ways to connect with your customers. Whether it's a traditional group or one that requires a more adventurous approach, we are experts in recruiting the right respondents to ensure your feedback is reliable and insightful.

Delve creates and fosters environments for dynamic dialogues between marketers and customers. Whether they be face-to-face, voice-to-voice, or technology-based settings like the Web, we are committed to providing the best in the business.

Count on our experts to bring you and your customers closer together. Connect with your Delve sales representative today!

Focus Groups
Pre-recruits
Web Surveys
Telephone Interviews
Central Location Testing
Taste Tests
Interactive Voice Response

www.delve.com
800-325-3338

Appleton, WI
Atlanta
Chicago
Columbus
Dallas
Kansas City
Los Angeles
Minneapolis
Philadelphia
Phoenix
Seattle
St. Louis





Experience Surveys

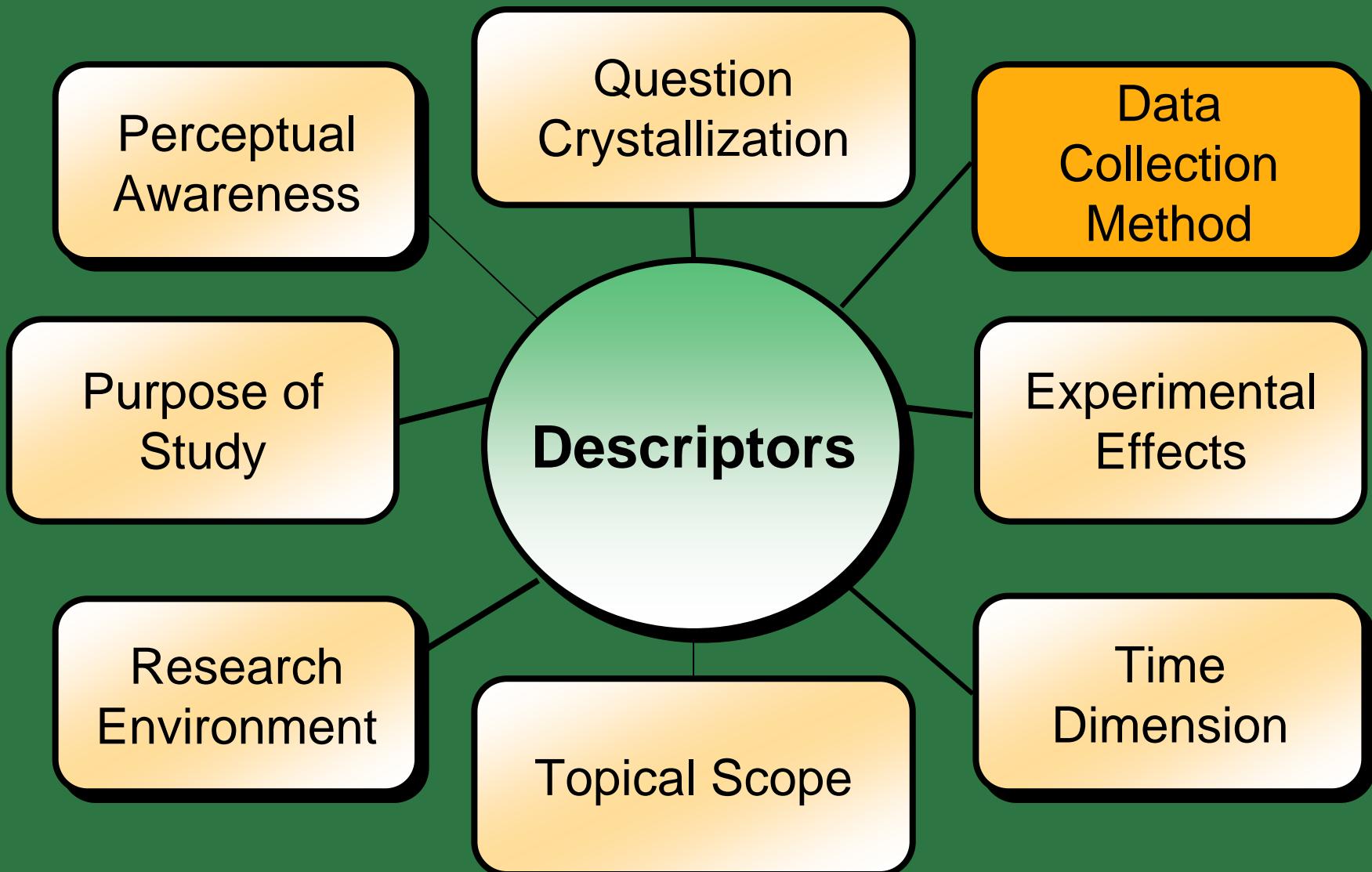
- What is being done?
- What has been tried in the past with or without success?
- How have things changed?
- Who is involved in the decisions?
- What problem areas can be seen?
- Whom can we count on to assist or participate in the research?

Focus Groups

- Group discussion
- 6-10 participants
- Moderator-led
- 90 minutes-2 hours



Descriptors of Research Design



Data Collection Method

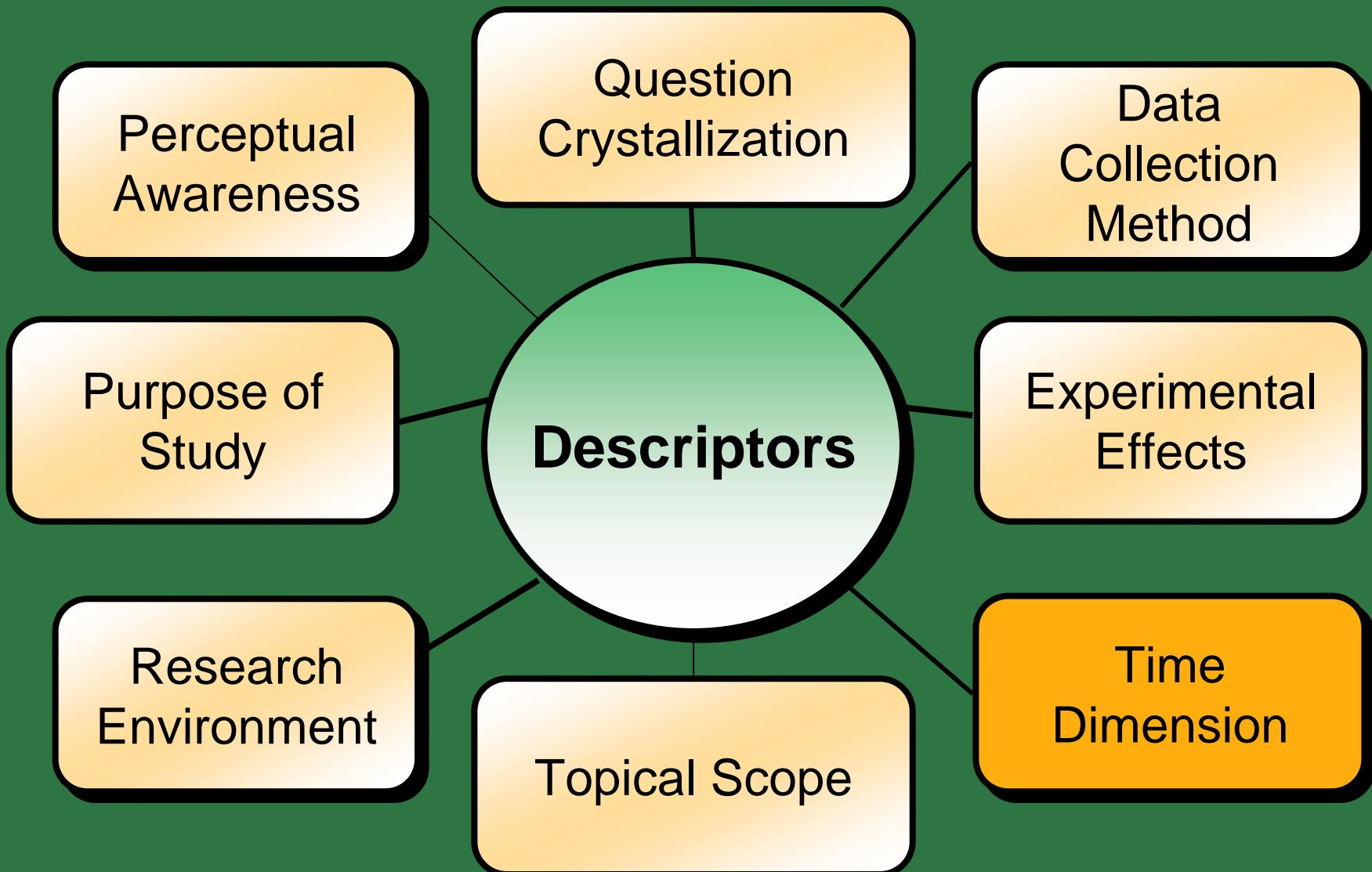
Monitoring



Communication



Descriptors of Research Design



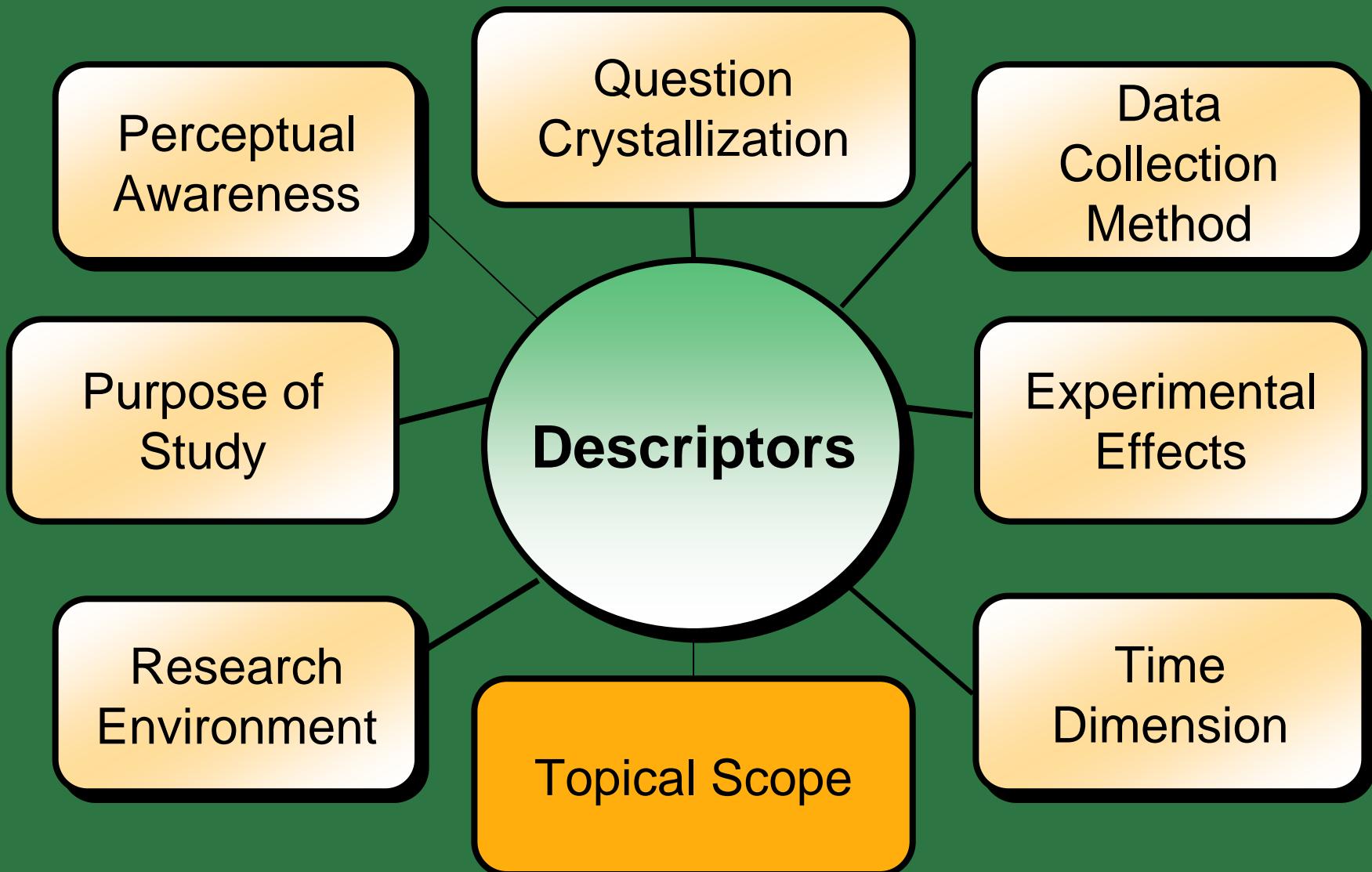
The Time Dimension

Cross-sectional

Longitudinal



Descriptors of Research Design



The Topical Scope

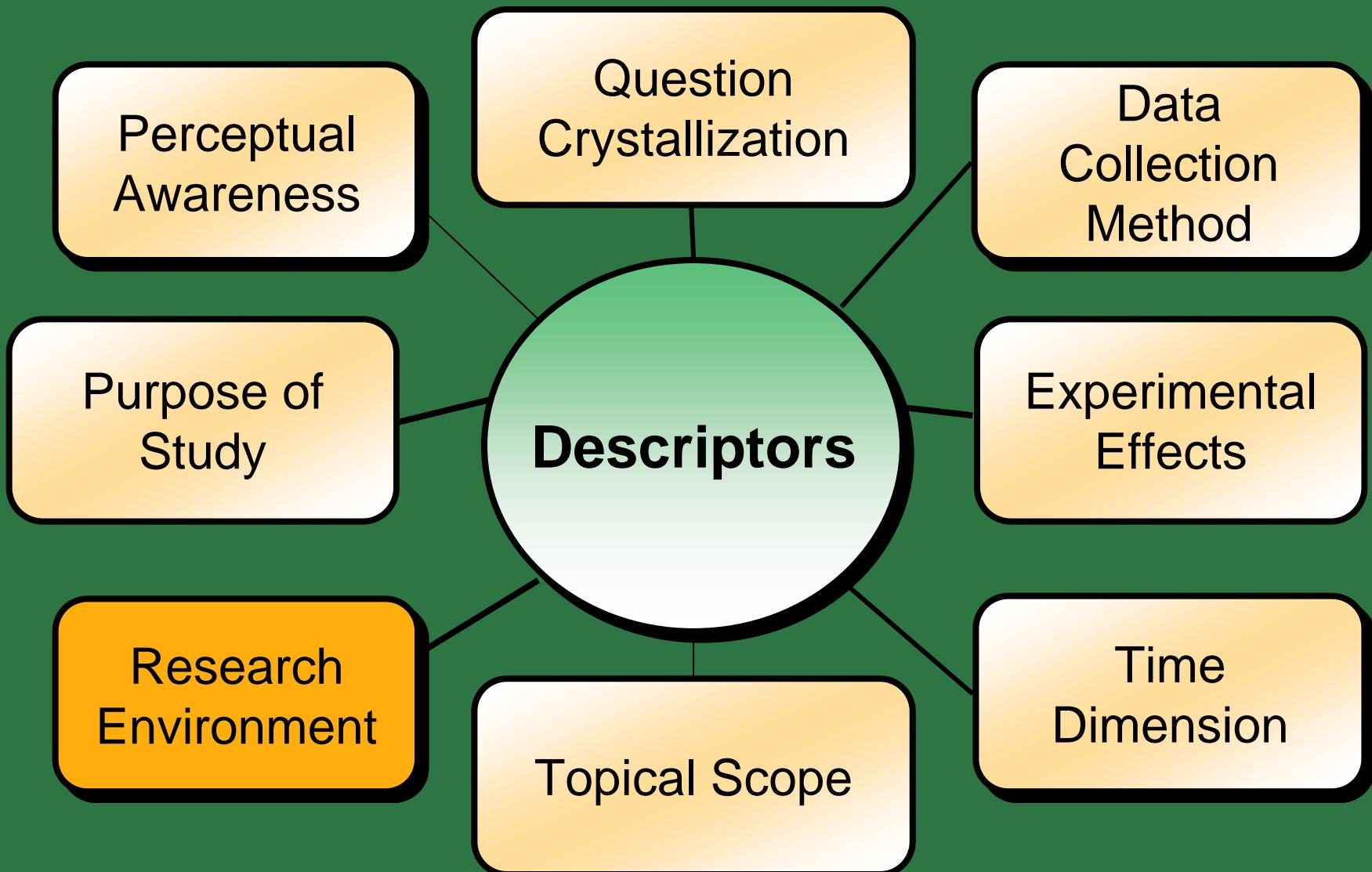
Statistical Study

- Breadth
- Population inferences
- Quantitative
- Generalizable findings

Case Study

- Depth
- Detail
- Qualitative
- Multiple sources of information

Descriptors of Research Design



The Research Environment

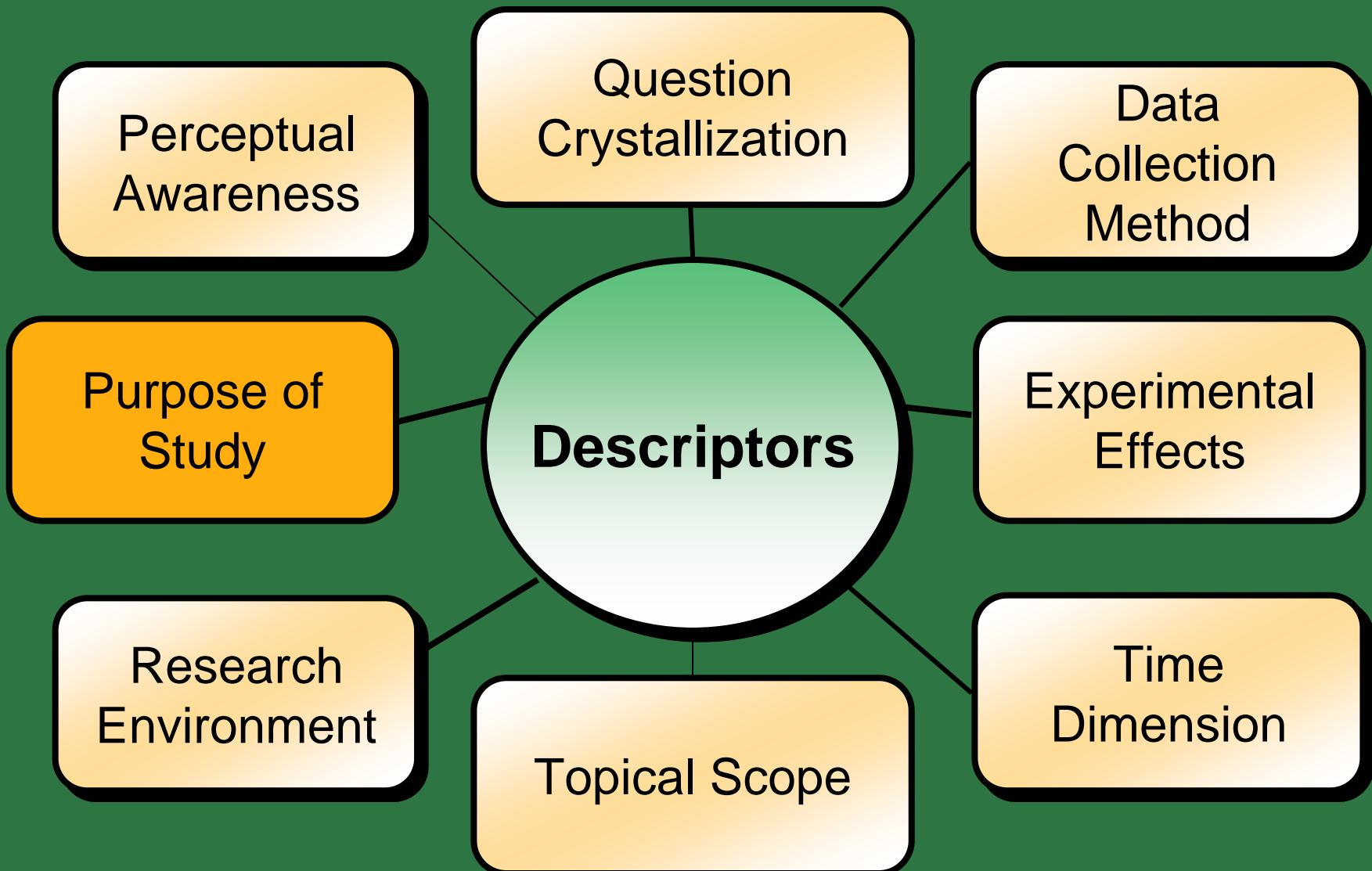
Field conditions

Lab conditions

Simulations



Descriptors of Research Design



Purpose of the Study

Reporting

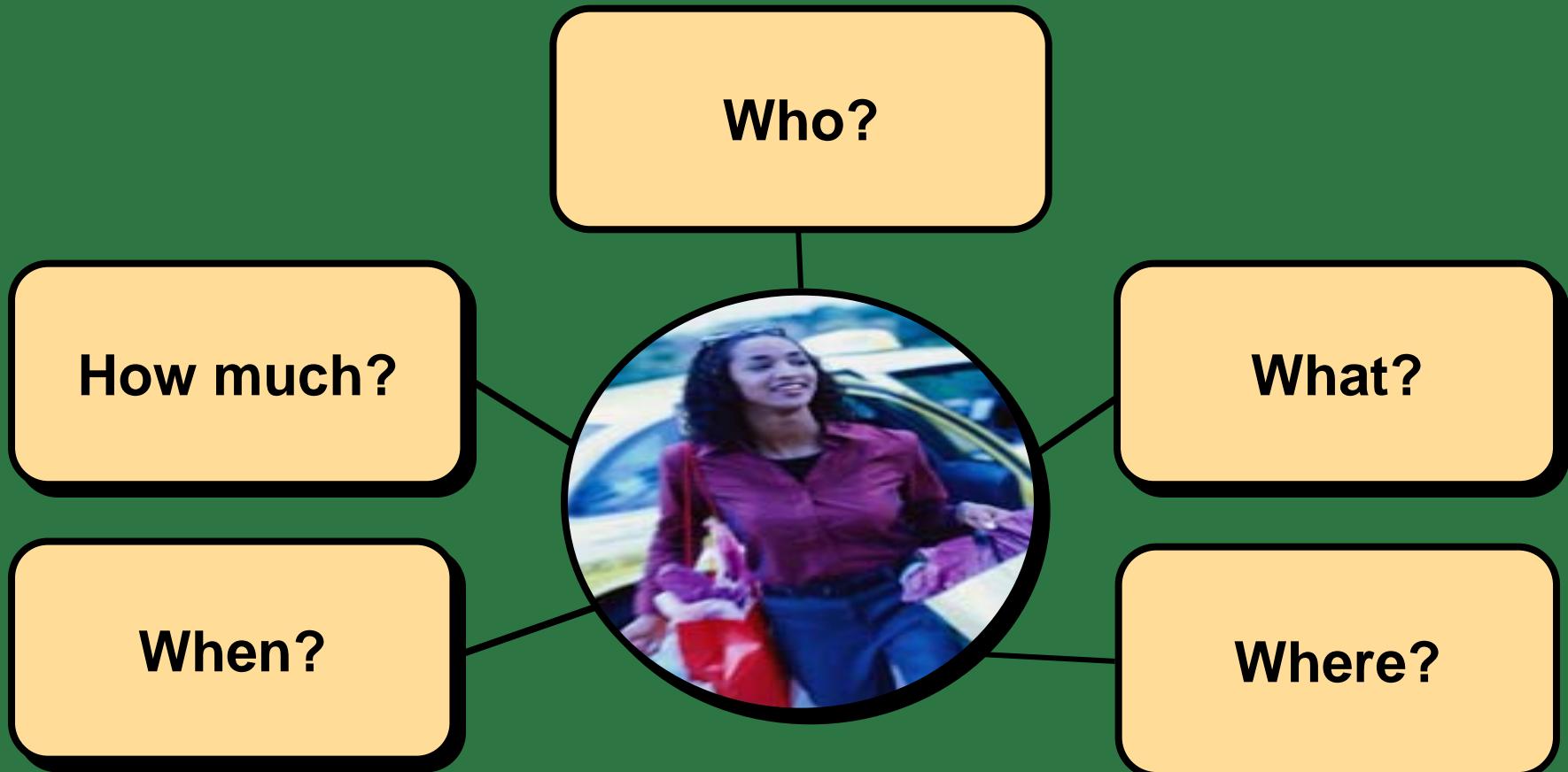
Descriptive

Causal -
Explanatory

Causal -
Predictive



Descriptive Studies



Descriptive Studies

Descriptions of population characteristics

Estimates of frequency of characteristics

Discovery of associations among variables



Tell Us Your Thoughts About Our Stickers!

Your recent issue of *Kraft food&family* contained reusable stickers you could use to mark the pages with your favorite recipes, tips, and ideas.

We'd like to hear what you thought about the stickers and if we should consider including more of them in a *Kraft food&family* magazine again in the future.

Please take a moment to complete this 3-6 question survey. We thank you for your time!

The Kraft Kitchens

1. Do you like having reusable stickers to mark your favorite recipes in *Kraft food&family* magazine?

Like very much

2. Have you used the stickers yet?

Yes, I have used them

3. How did you mainly use the stickers?

select

4. On a scale of 1-5, please rate how easy it is to find recipes in your *Kraft food&family* magazine? (1 is extremely easy and 5 is extremely hard)

1 2 3 4 5
easy hard

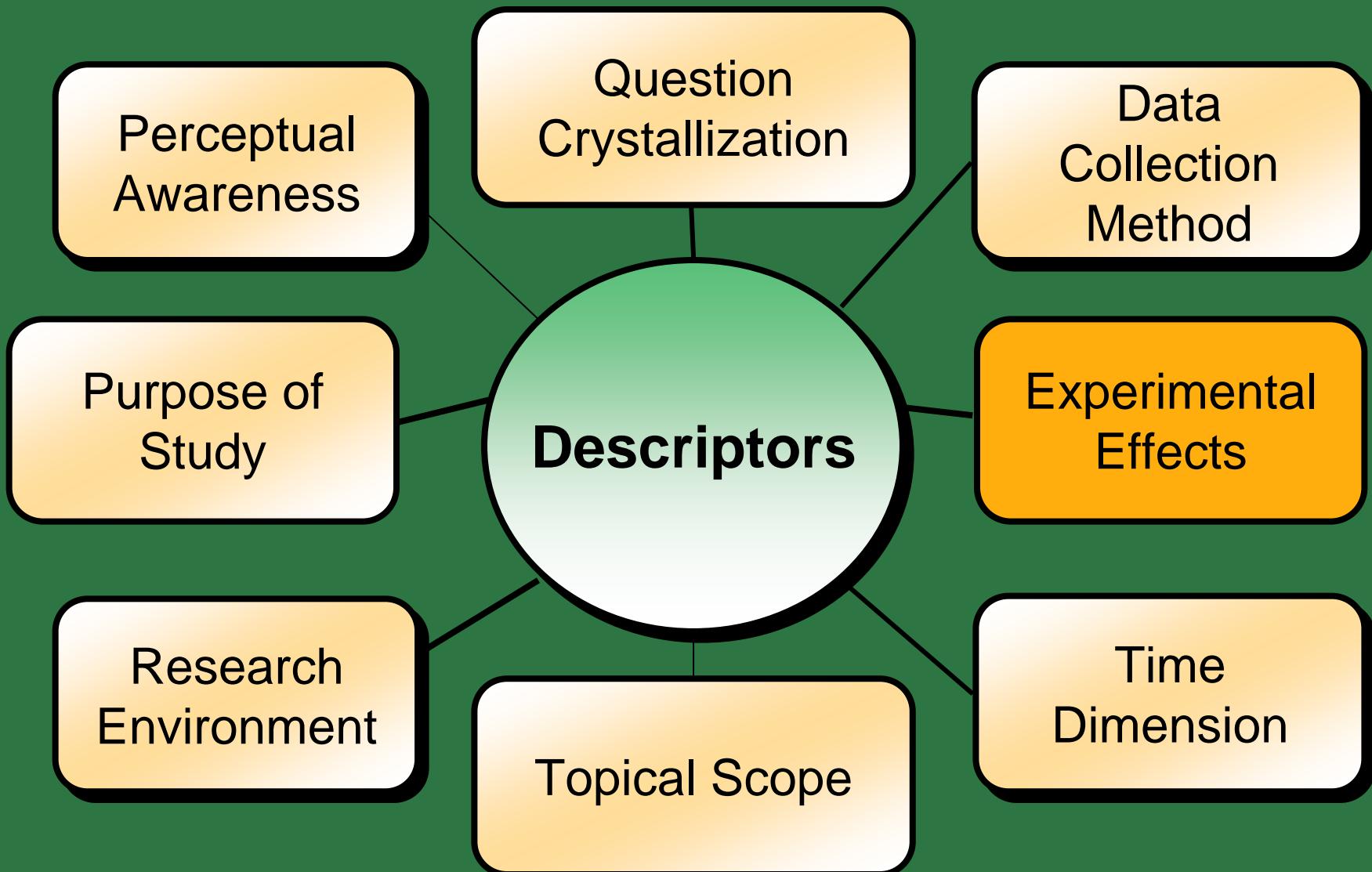
5. Do you think you'll make more of the recipes now because you can tab your favorites in the magazine with the stickers?

Yes No

6. How would you like to see the stickers labeled?

select

Descriptors of Research Design





Experimental Effects

Ex Post Facto Study

- After-the-fact report on what happened to the measured variable

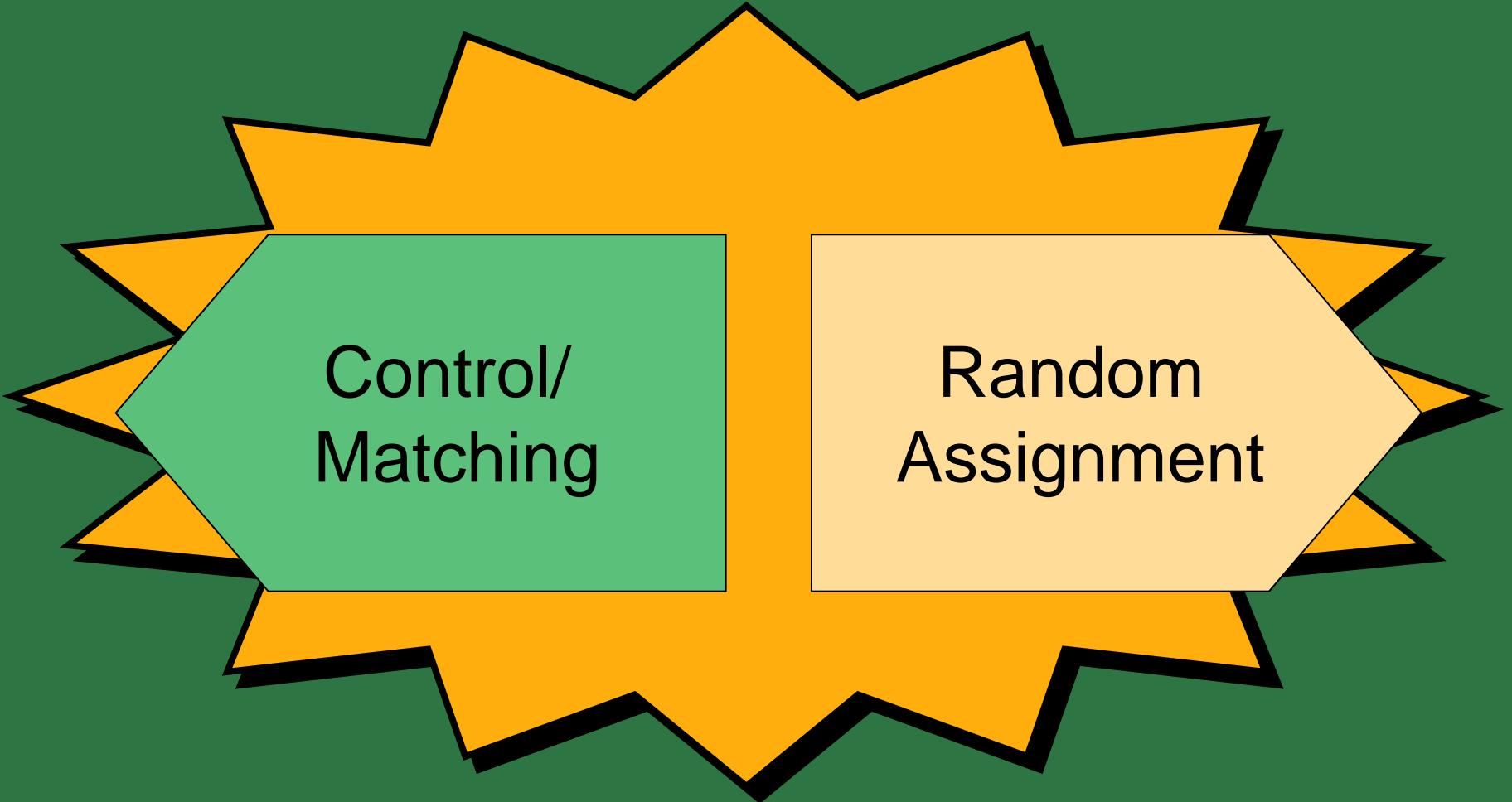
Experiment

- Study involving the manipulation or control of one or more variables to determine the effect on another variable

Ex Post Facto Design

	Fishing Club Member		Non-Fishing-Club Member	
Age	High Absentee	Low Absentee	High Absentee	Low Absentee
Under 30 years	36	6	30	48
30 to 45	4	4	35	117
45 and over	0	0	5	115

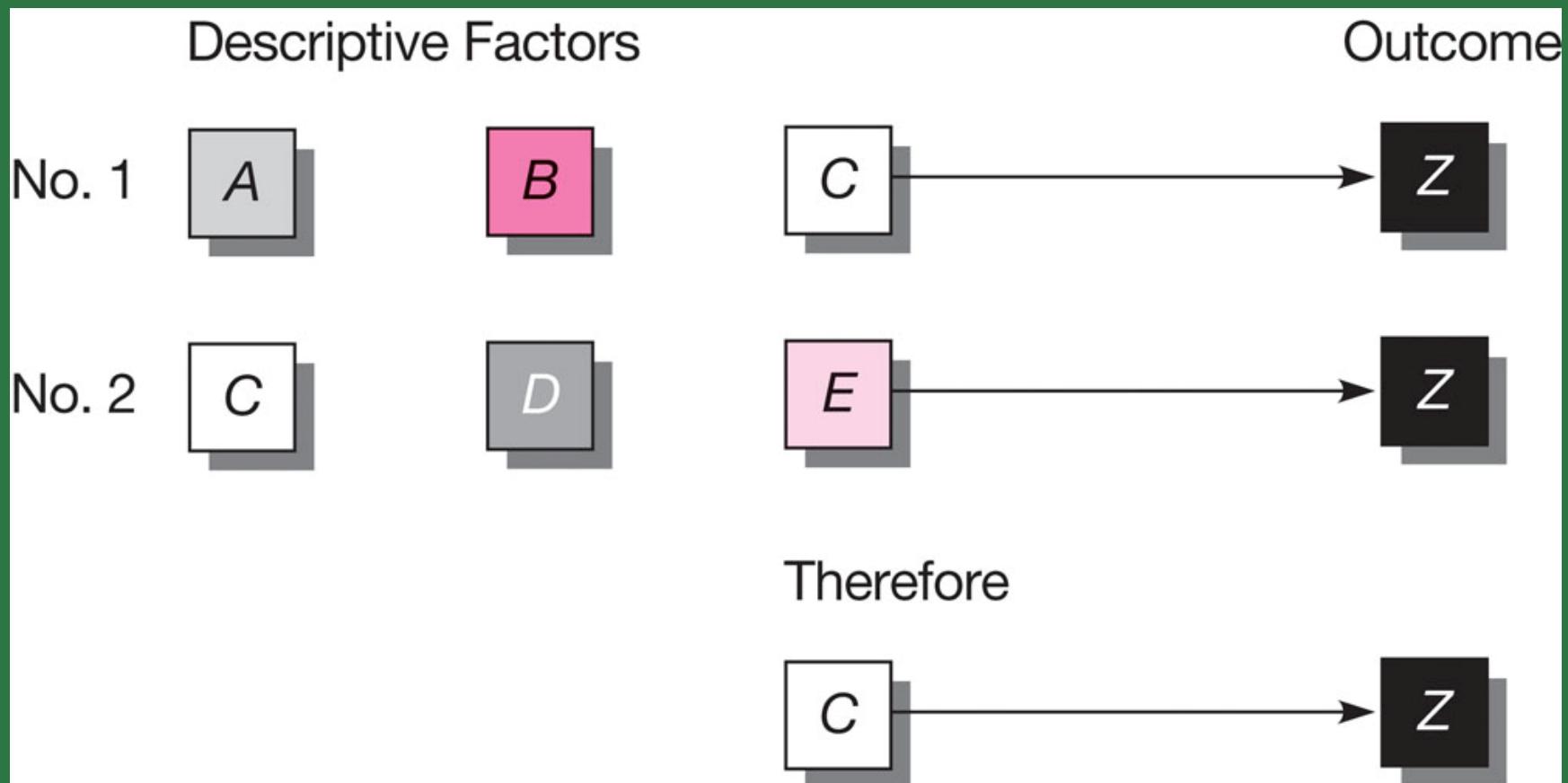
Causation and Experimental Design



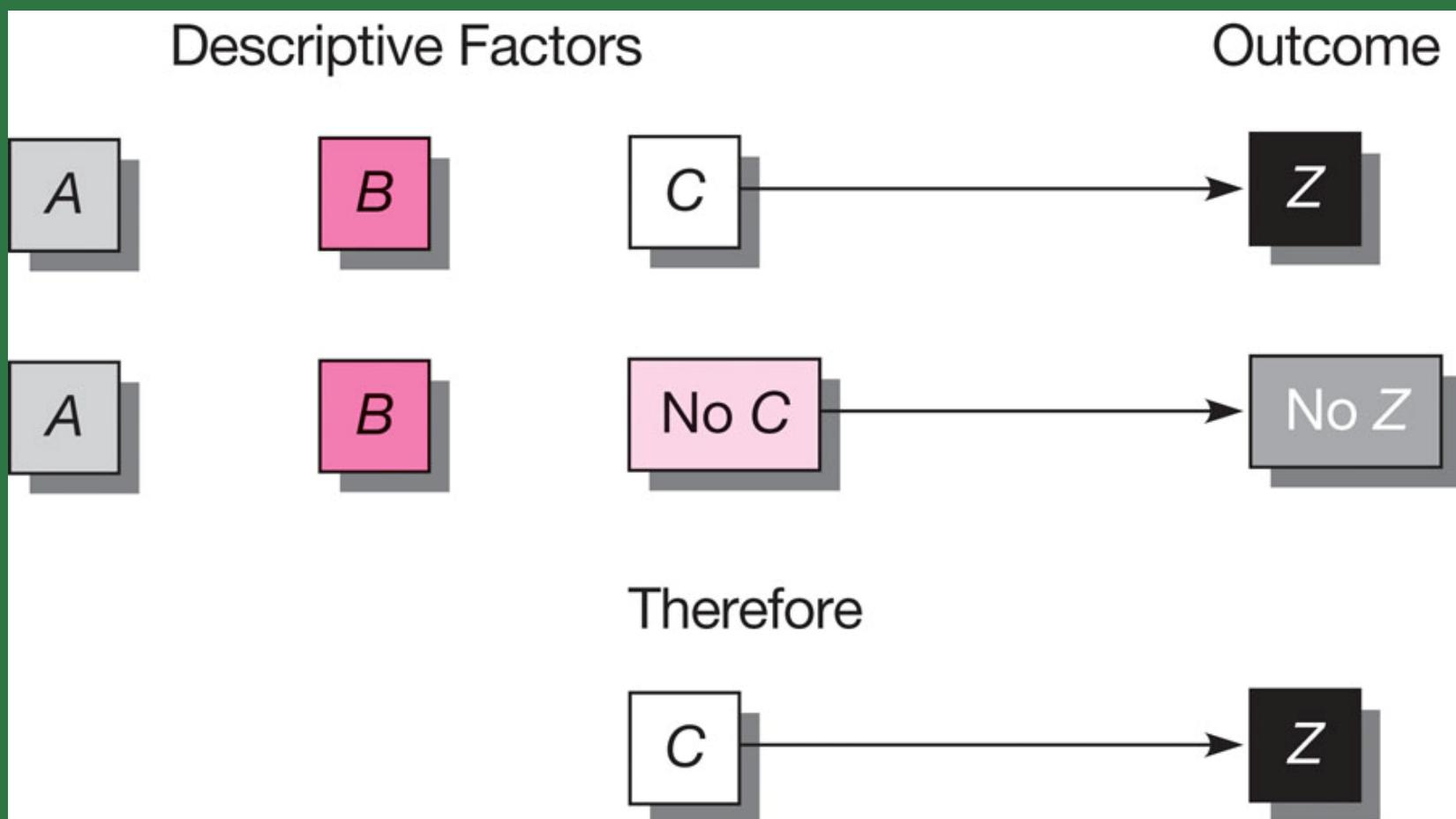
Control/
Matching

Random
Assignment

Mills Method of Agreement



Mills Method of Difference

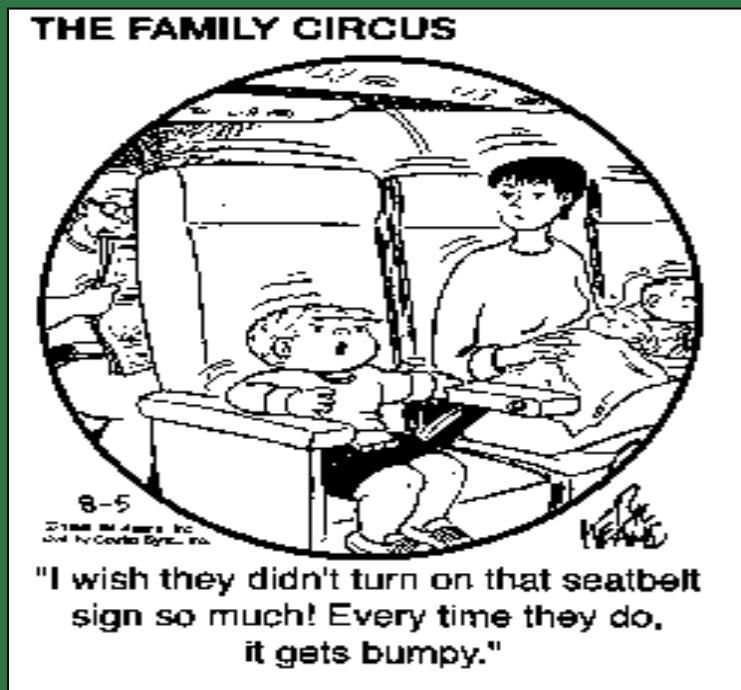


Causal Studies

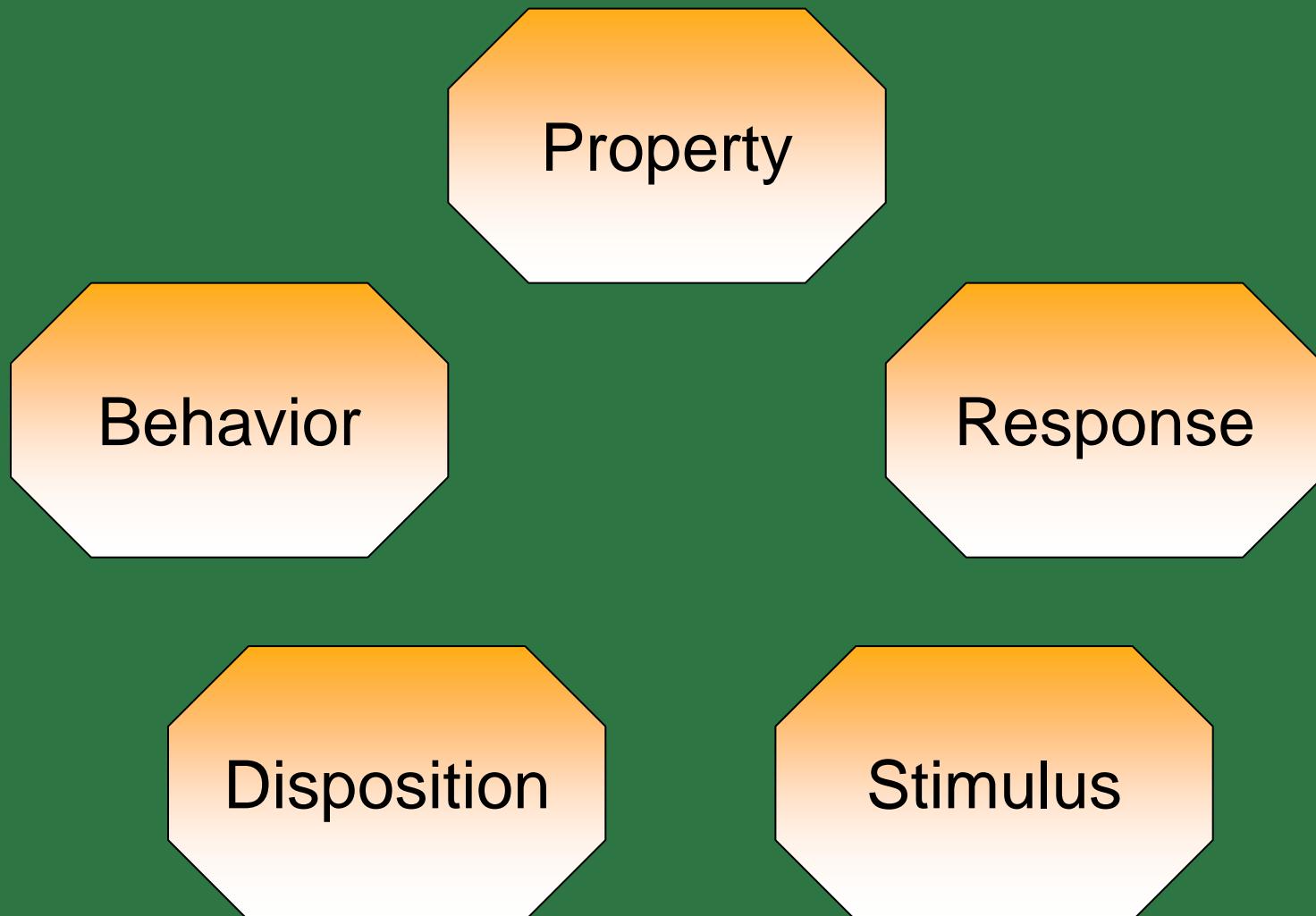
Symmetrical

Reciprocal

Asymmetrical



Understanding Casual Relationships



Asymmetrical Casual Relationships

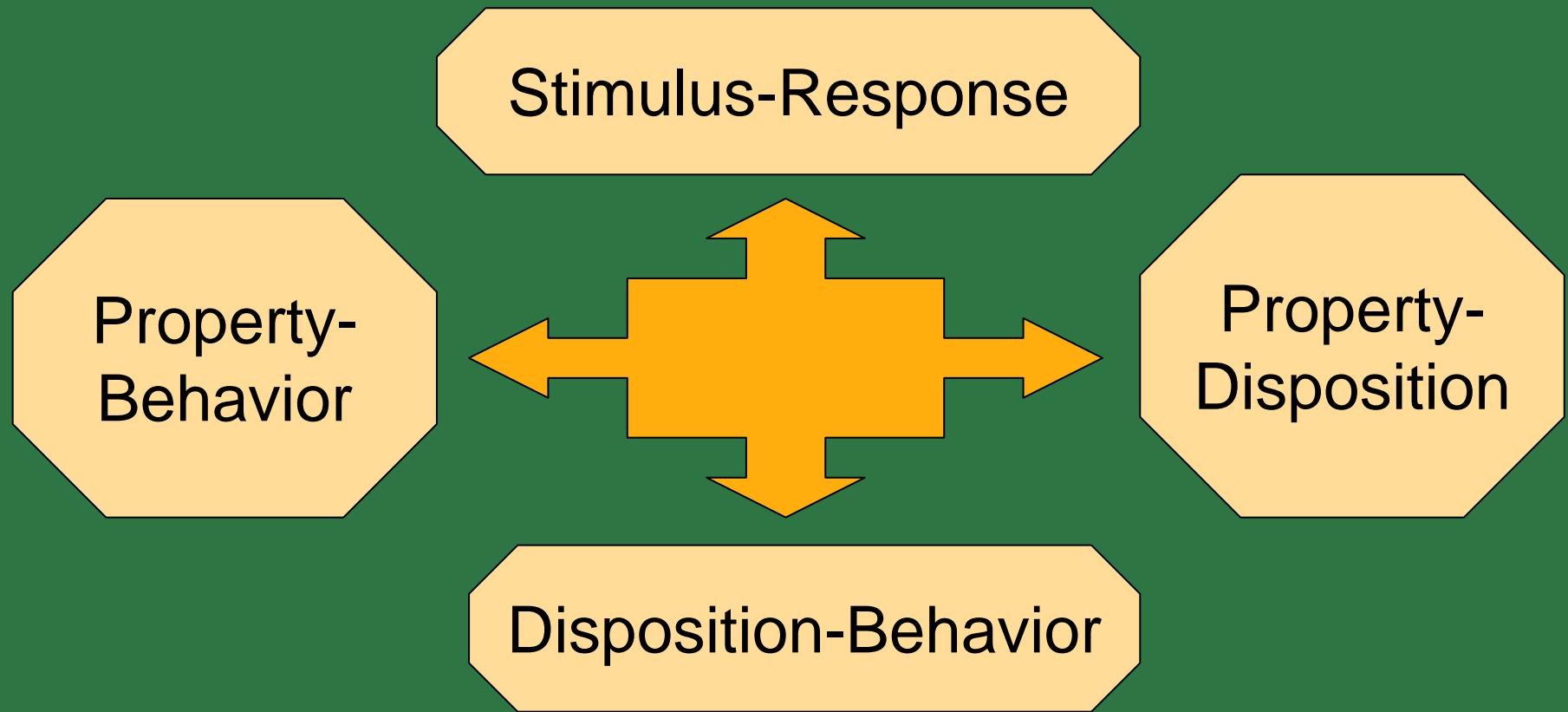


Exhibit 6-6 Types of Asymmetrical Causal Relationships

Relationship Type	Nature of Relationship	Examples
Stimulus-response	An event or change results in a response from some object.	<ul style="list-style-type: none">• A change in work rules leads to a higher level of worker output.• A change in government economic policy restricts corporate financial decisions.• A price increase results in fewer unit sales.
Property-disposition	An existing property causes a disposition.	<ul style="list-style-type: none">• Age and attitudes about saving.• Gender attitudes toward social issues.• Social class and opinions about taxation.
Disposition-behavior	A disposition causes a specific behavior.	<ul style="list-style-type: none">• Opinions about a brand and its purchase.• Job satisfaction and work output.• Moral values and tax cheating.
Property-behavior	An existing property causes a specific behavior.	<ul style="list-style-type: none">• Stage of the family life cycle and purchases of furniture.• Social class and family savings patterns.• Age and sports participation.

Evidence of Causality

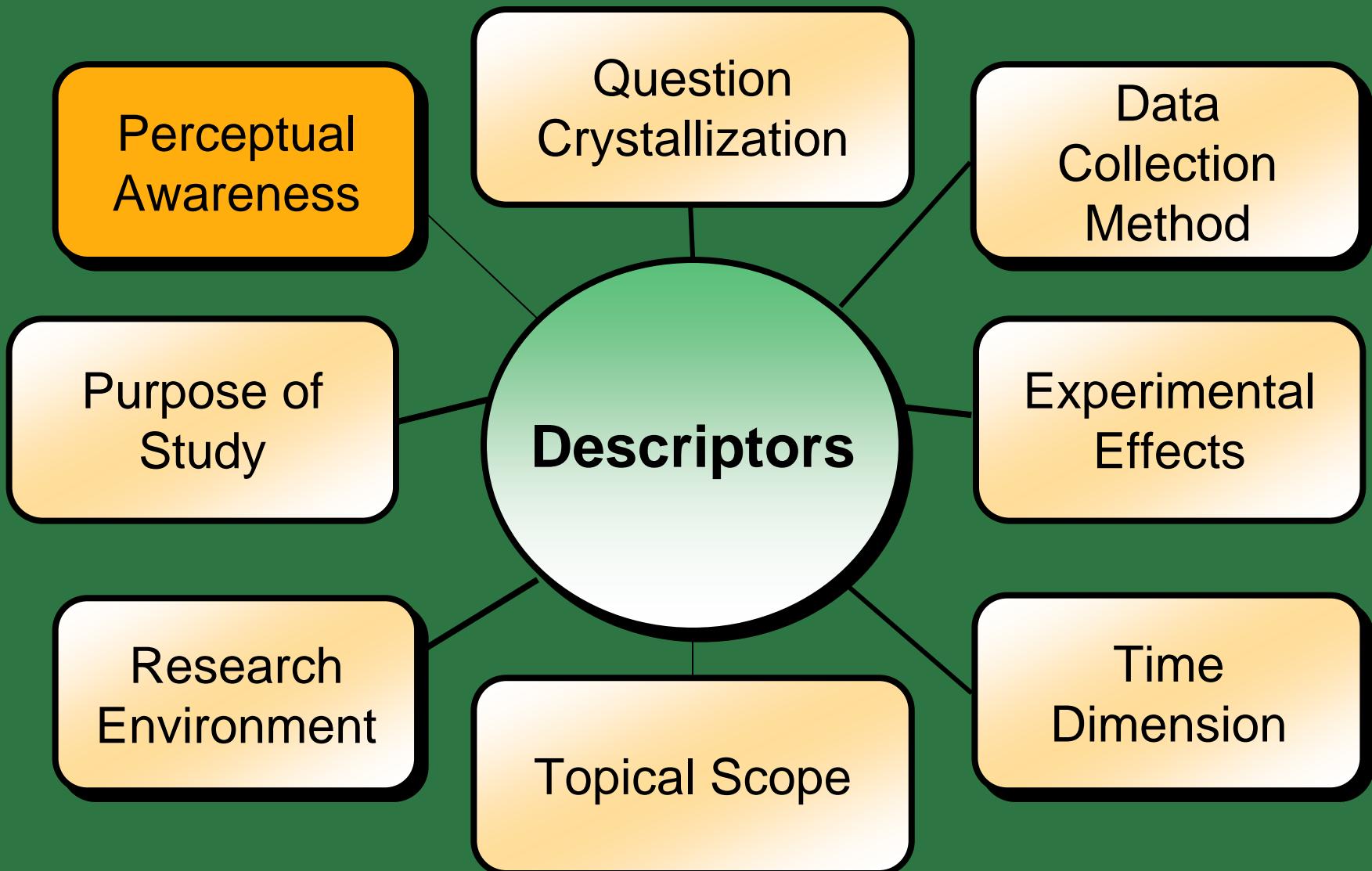
Covariation between
A and B

Time order of events

No other possible
causes of B



Descriptors of Research Design



Participants' Perceptual Awareness



No deviation perceived

Deviations perceived
as unrelated

Deviations perceived as
researcher-induced

Descriptors of Research Design

Category	Options
The degree to which the research question has been crystallized	<ul style="list-style-type: none">• Exploratory study• Formal study
The method of data collection	<ul style="list-style-type: none">• Monitoring• Communication Study
The power of the researcher to produce effects in the variables under study	<ul style="list-style-type: none">• Experimental• Ex post facto
The purpose of the study	<ul style="list-style-type: none">• Reporting• Descriptive• Causal-Explanatory• Causal-Predictive
The time dimension	<ul style="list-style-type: none">• Cross-sectional• Longitudinal
The topical scope—breadth and depth—of the study	<ul style="list-style-type: none">• Case• Statistical study
The research environment	<ul style="list-style-type: none">• Field setting• Laboratory research• Simulation
The participants' perceptual awareness of the research activity	<ul style="list-style-type: none">• Actual routine• Modified routine

Key Terms

- Asymmetrical relationship
- Case study
- Causal study
- Causation
- Children's panels
- Communication study
- Control
- Control group
- Correlation
- Cross-sectional study

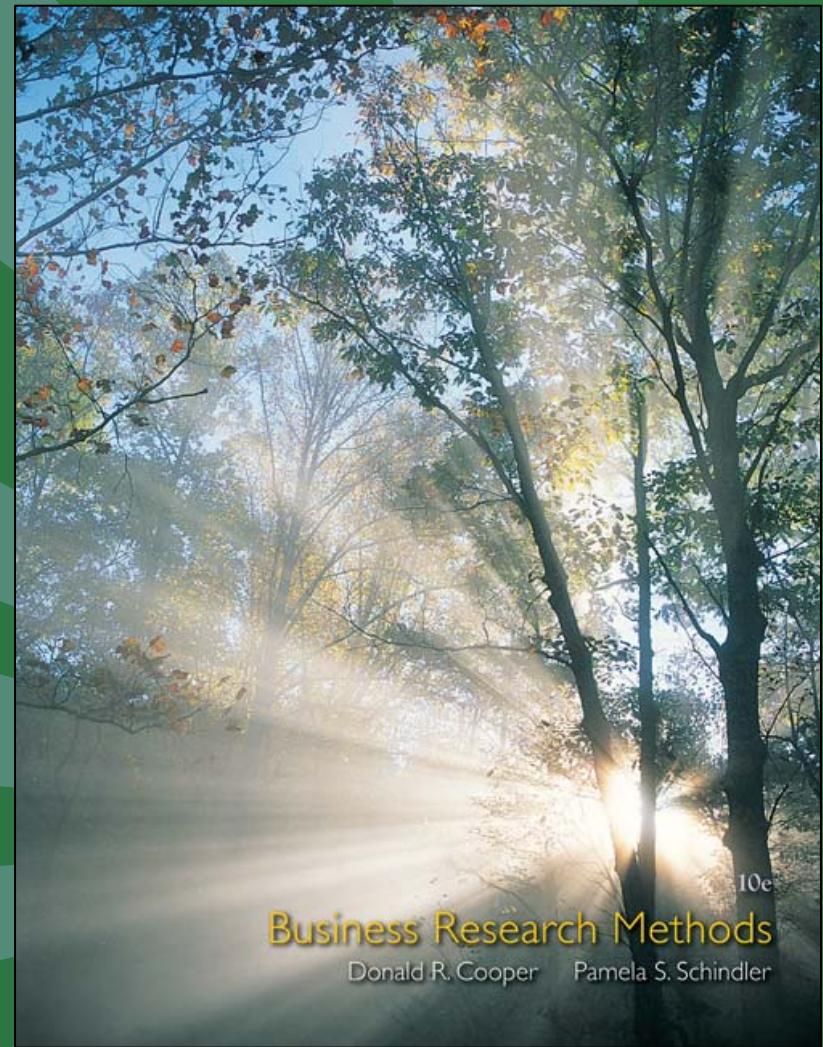
- Descriptive study
- Ethnographic research
- Ex post facto design
- Experience
- Experiment
- Exploratory study
- Field conditions
- Focus group
- Formal study
- Individual depth interview
- Intranet

Key Terms (cont.)

- Laboratory conditions
- Longitudinal study
- Matching
- Monitoring
- Primary data
- Qualitative techniques
- Random assignment
- Reciprocal relationship
- Research design
- Secondary data
- Simulation
- Statistical study
- Symmetrical relationship

Chapter 7

Qualitative Research





Learning Objectives

Understand . . .

- How qualitative methodologies differ from quantitative methodologies.
- The controversy surrounding qualitative research.
- The types of decisions that use qualitative methodologies.
- The different qualitative research methodologies.

PulsePoint: Research Revelation

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The thousands of new blogs started each day according to Technorati.

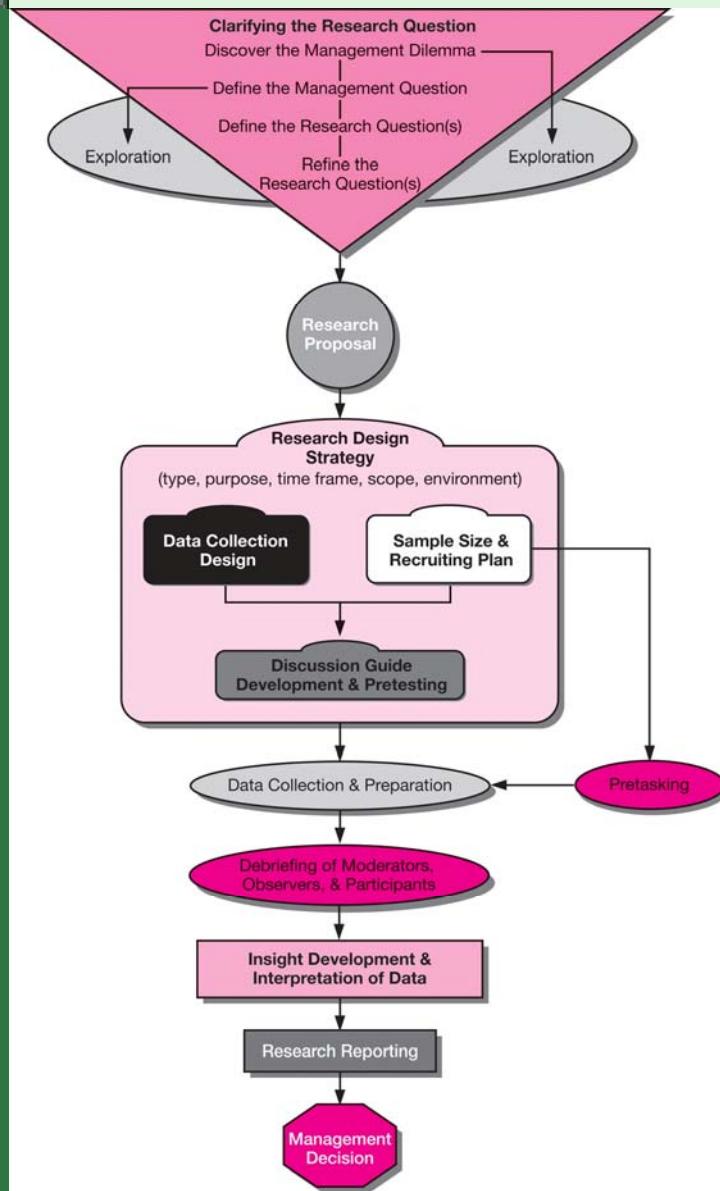


Emotion has Power

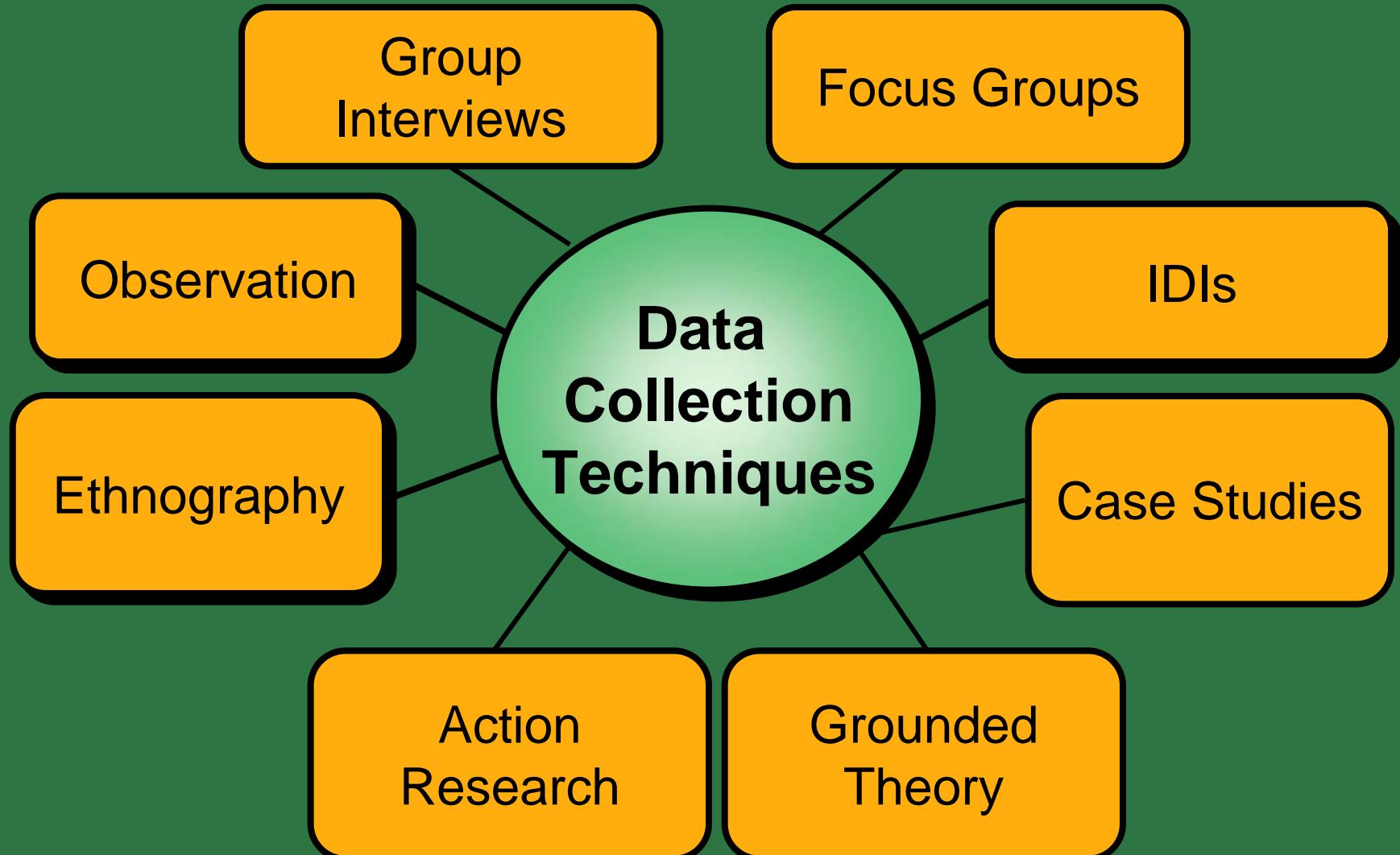
“We’re learning that emotion plays a key role in decisions that are very logical and shouldn’t have anything to do with emotion . . . If [researchers] are trying to make a connection . . . they have to understand how the brain works.”

*Justine Meaux,
BrightHouse Neurostrategies*

Qualitative Research and the Research Process



Qualitative Research

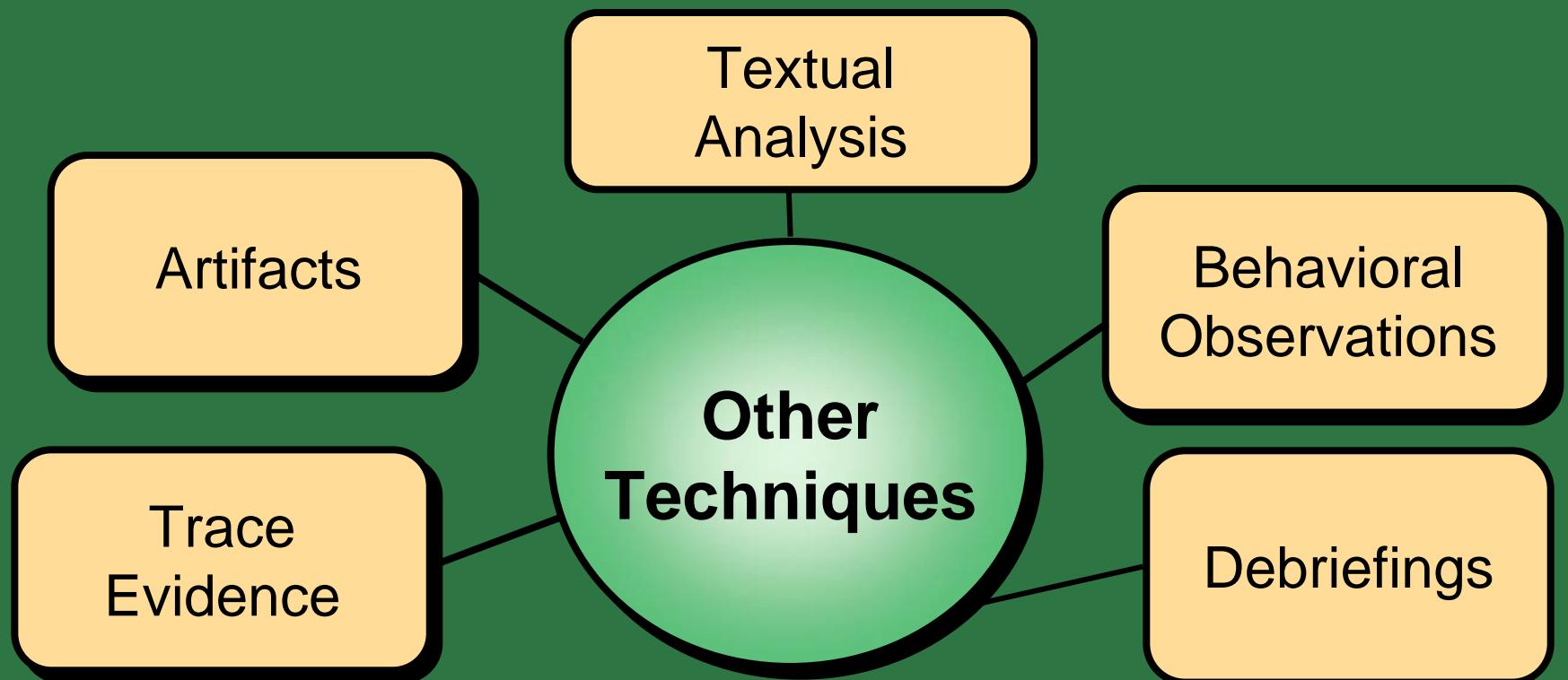


Why Use Qualitative Research?

“Most of what influences what we say and do occurs below the level of awareness. That’s why we need new techniques: to get at hidden knowledge – to get at what people don’t know they know.”

Jerry Zaltman

Qualitative Research





Qualitative Research in Business

- Job Analysis
- Advertising Concept Development
- Productivity Enhancement
- New Product Development
- Benefits Management
- Retail Design
- Process Understanding
- Union Representation
- Market Segmentation
- Sales Analysis

Data Sources

People

Organizations



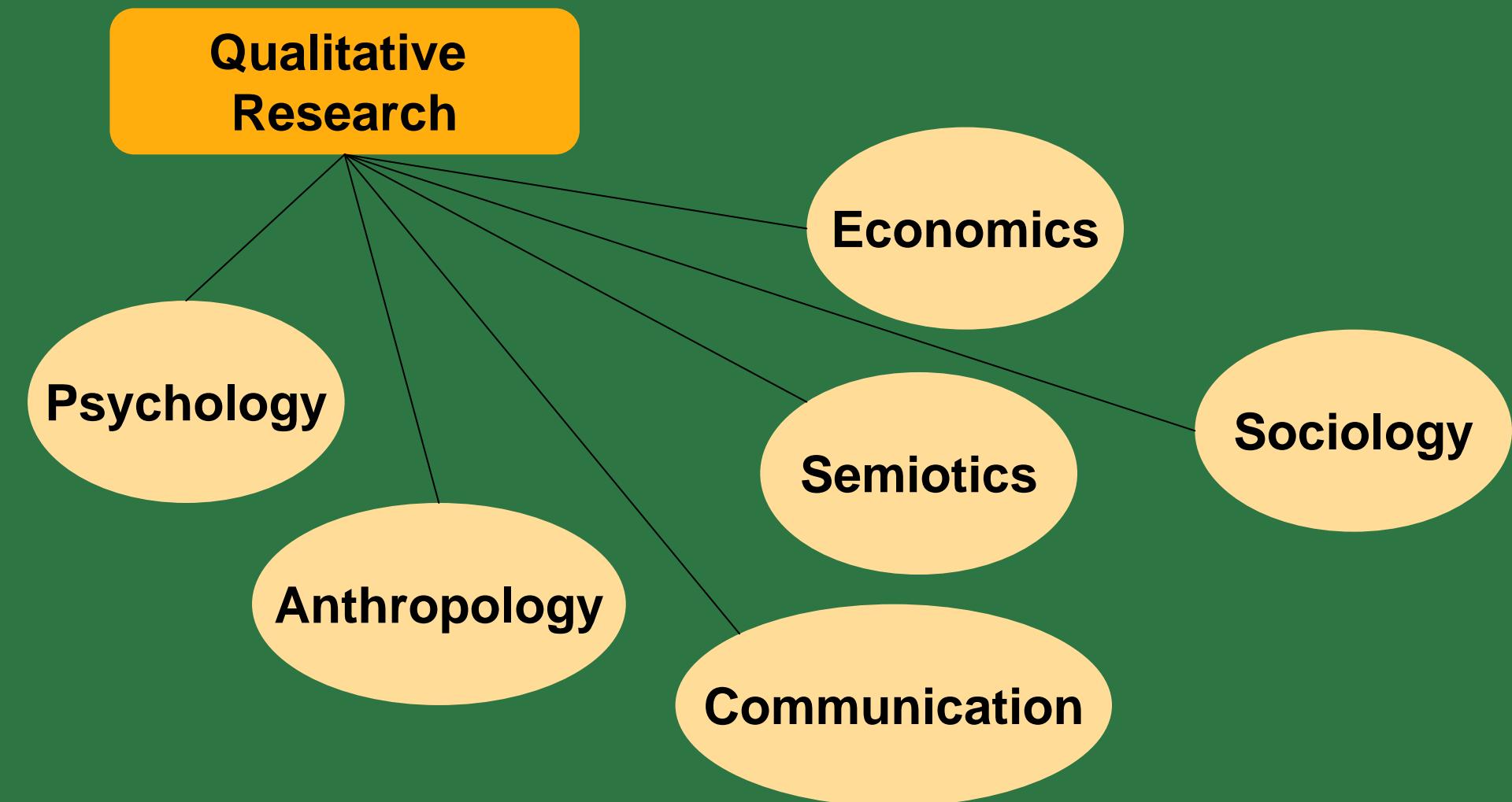
Texts

Environments

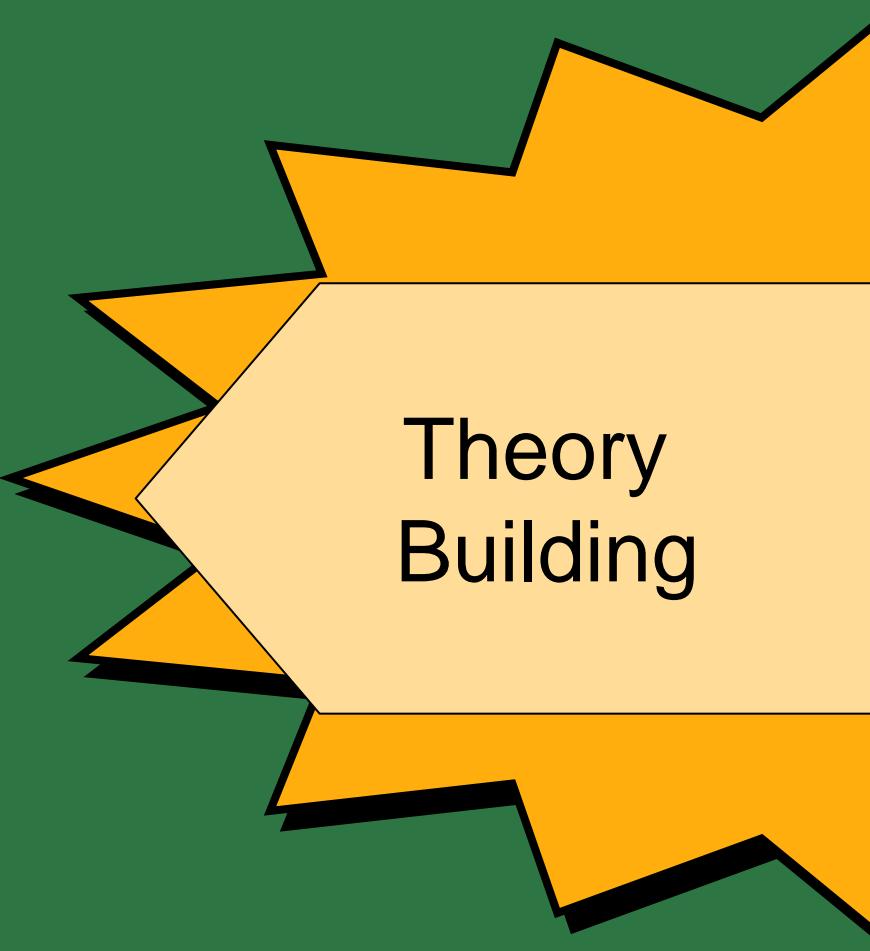
Artifacts/ media
products

Events and
happenings

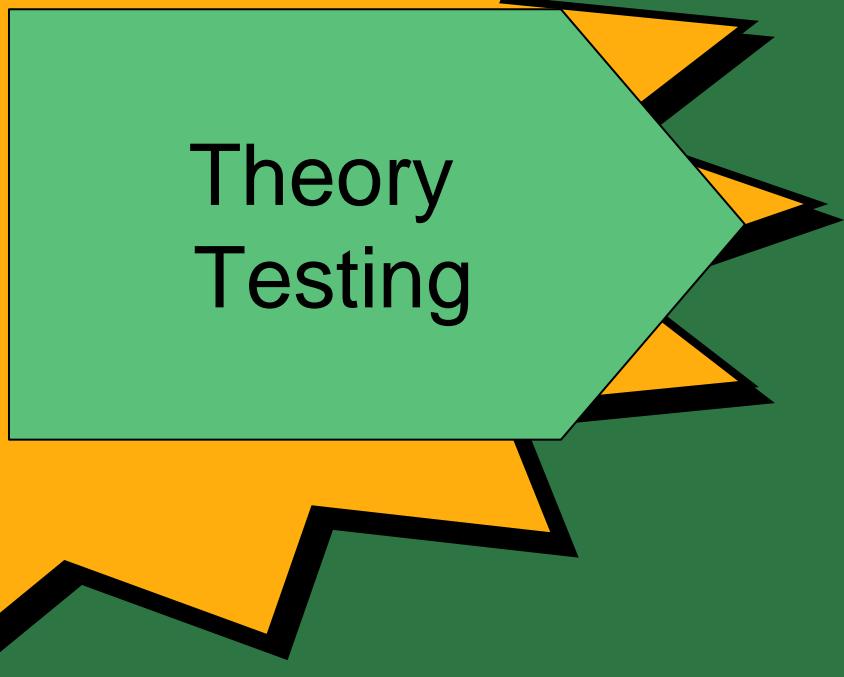
The Roots of Qualitative Research



Distinction between Qualitative & Quantitative



Theory
Building



Theory
Testing

Focus of Research



Qualitative

- Understanding
- Interpretation

Quantitative

- Description
- Explanation

Researcher Involvement



Qualitative

- High
- Participation-based

Quantitative

- Limited
- Controlled

Research Design

Qualitative

- Longitudinal
- Multi-method

Quantitative

- Cross-sectional or longitudinal
- Single method

Sample Design and Size

Qualitative

- Non-probability
- Purposive
- Small sample

Quantitative

- Probability
- Large sample



Data Type and Preparation



Conceptor® Online Concept Testing

Will your new product idea fly?

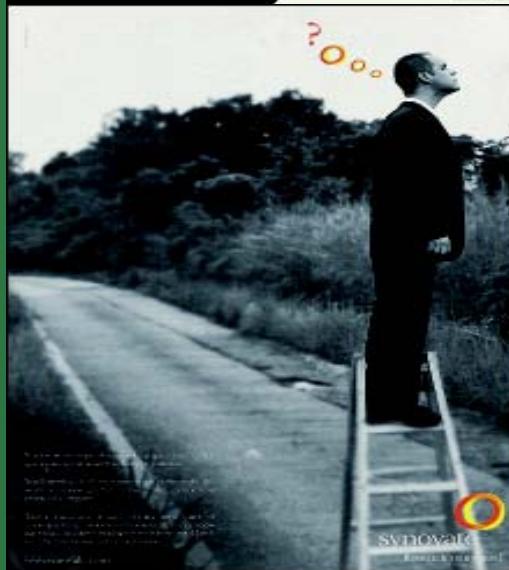
We can answer the question and many more with Conceptor™, our industry-leading, internet-based concept testing system that features:

- In-depth disposition to identify problems and improve chances of success.
- Price-sensitivity analysis to help determine optimal pricing.
- Target market refinement to improve advertising media focus.
- Scores of econometric models to predict your sales.

We have over 3,500,000 consumers in our state-of-the-art online panel ready to evaluate your new product idea. Let us help you refine your new product research system.

Call 1-877-40-5166 or visit: www.conceptoronline.com

Decision Analyst
The global leader in analytical research systems

Because he thinks plaid is slimming. Because the chain makes him feel young again. Because he believes the world needs more purple.

You might not understand this guy, but you will.

Contact the Harris Interactive Qualitative Research Practice at 877.919.4765. We'll explore him together.

To learn more, check out our free Online Demo at www.harrisinteractive.com/qual

Harris Interactive
MARKET RESEARCH
The Harris Poll® PERIOD

SYNTHESIS
Research Institute

Qualitative

- Verbal or pictorial
- Reduced to verbal codes

Quantitative

- Verbal descriptions
- Reduced to numeric codes

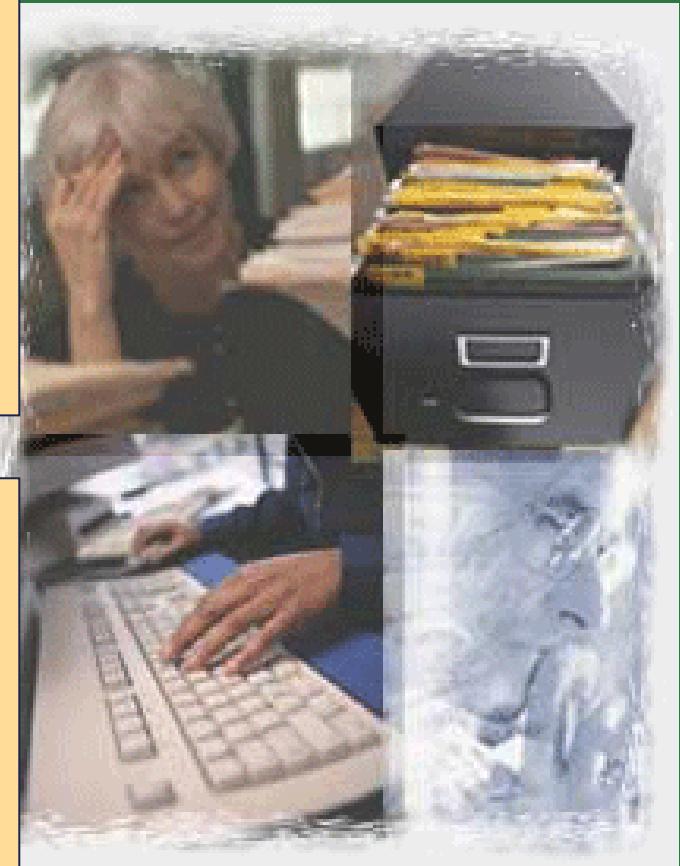
Turnaround

Qualitative

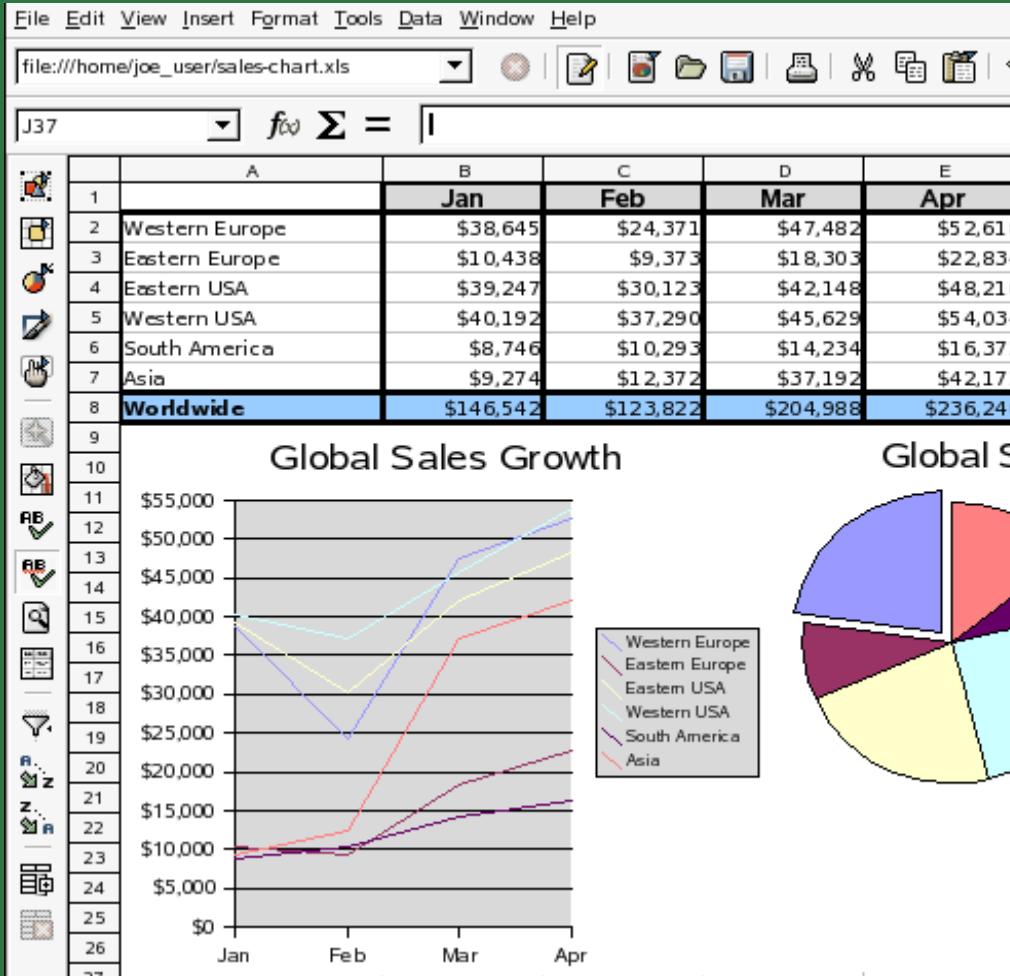
- Shorter turnaround possible
- Insight development ongoing

Quantitative

- May be time-consuming
- Insight development follows data entry



Data Analysis



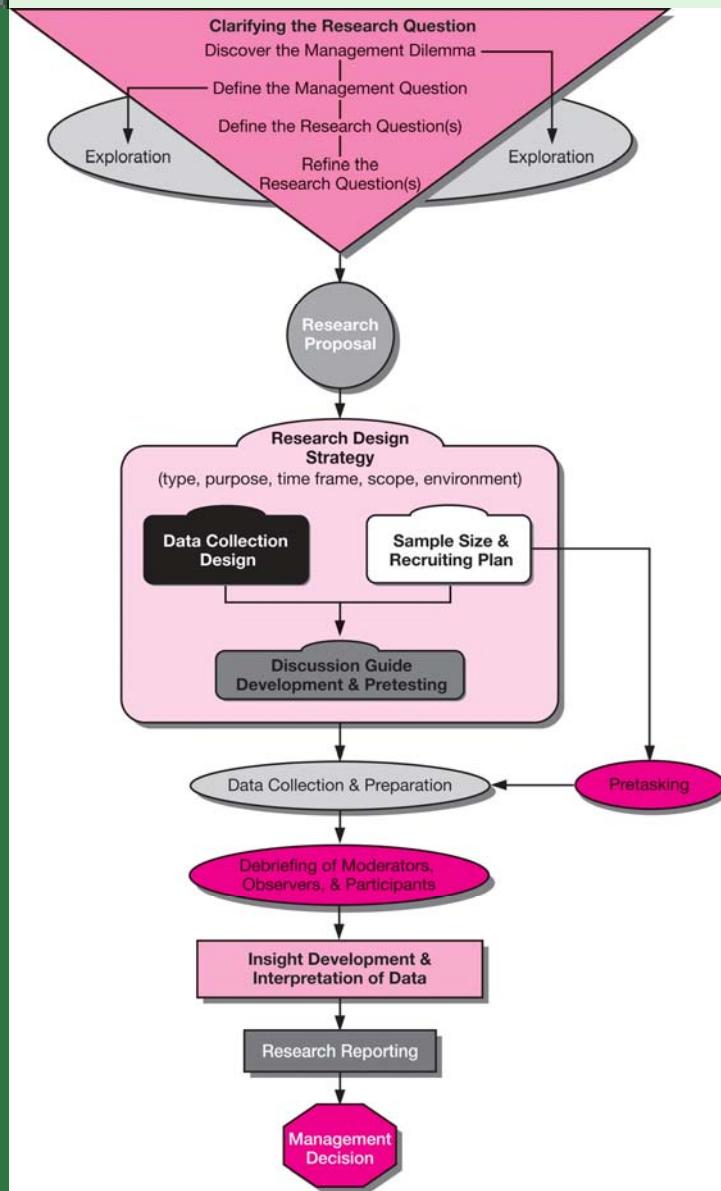
Qualitative

- Nonquantitative; human
- Judgment mixed with fact
- Emphasis on themes

Quantitative

- Computerized analysis
- Facts distinguished
- Emphasis on counts

Qualitative Research and the Research Process



Pretasking Activities

Use product in home

Bring visual stimuli

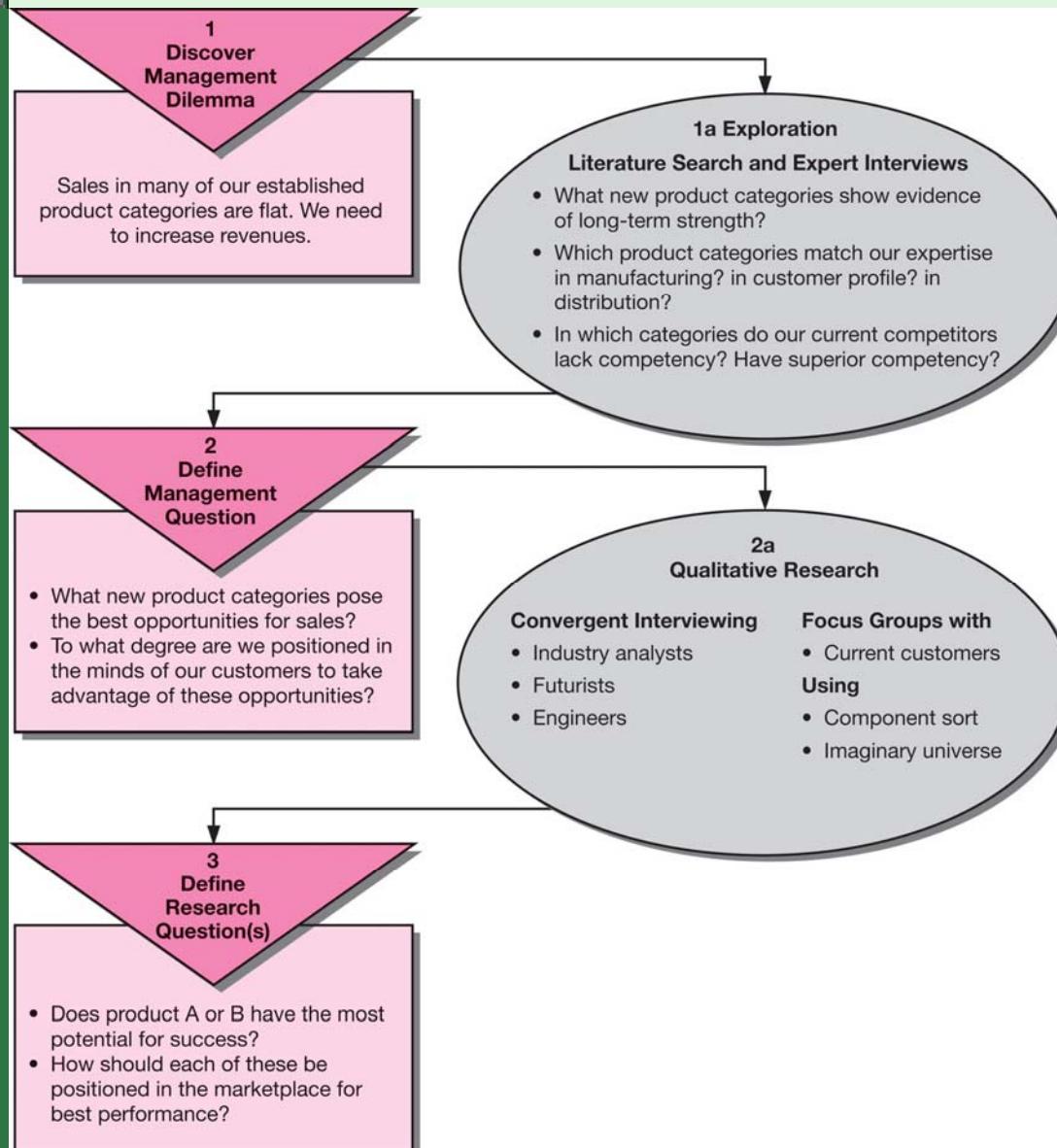
Create collage

Keep diaries

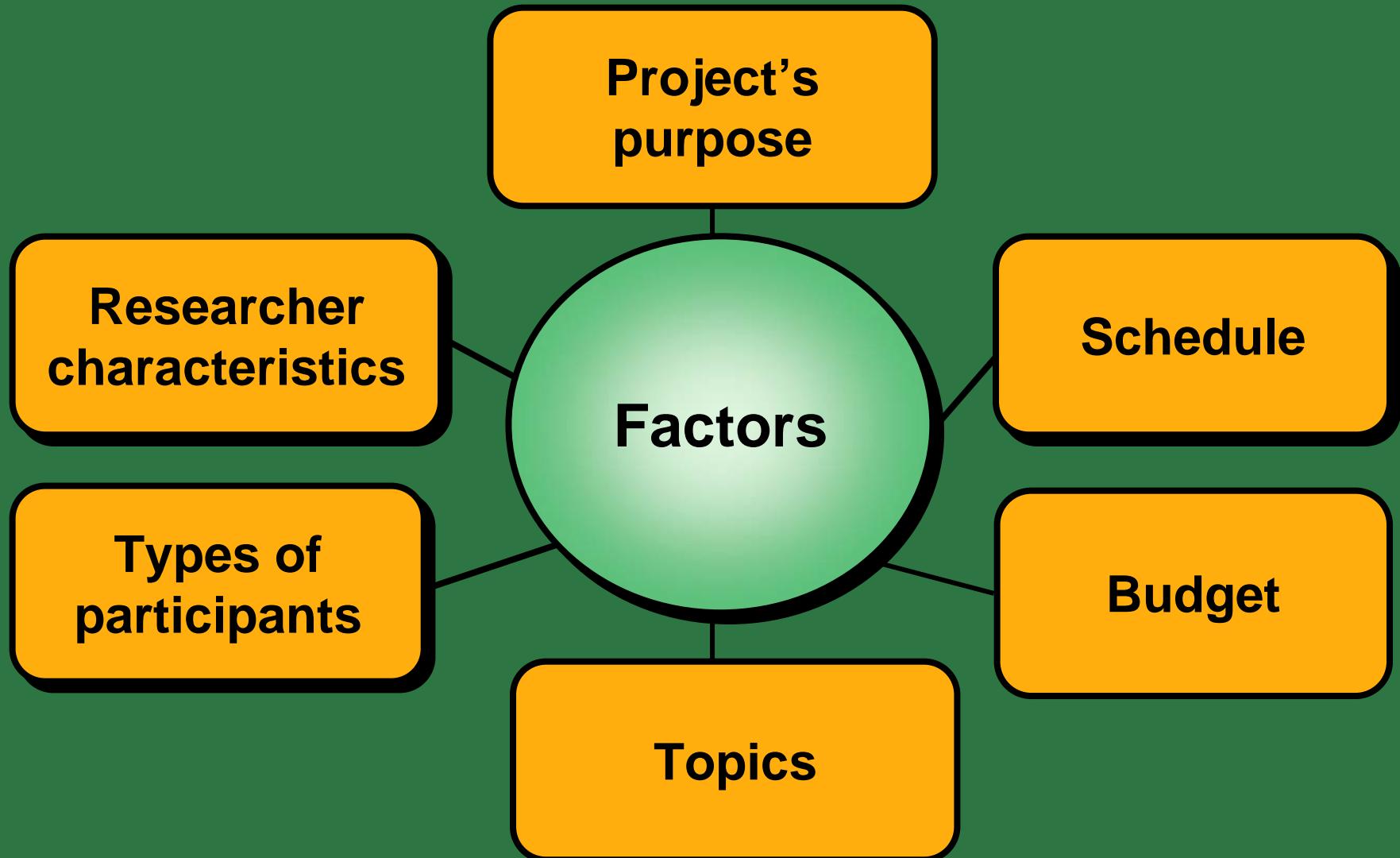
Draw pictures

Construct a story

Formulating the Qualitative Research Question



Choosing a Qualitative Method



NonProbability Sampling

**Purposive
Sampling**

**Snowball
Sampling**

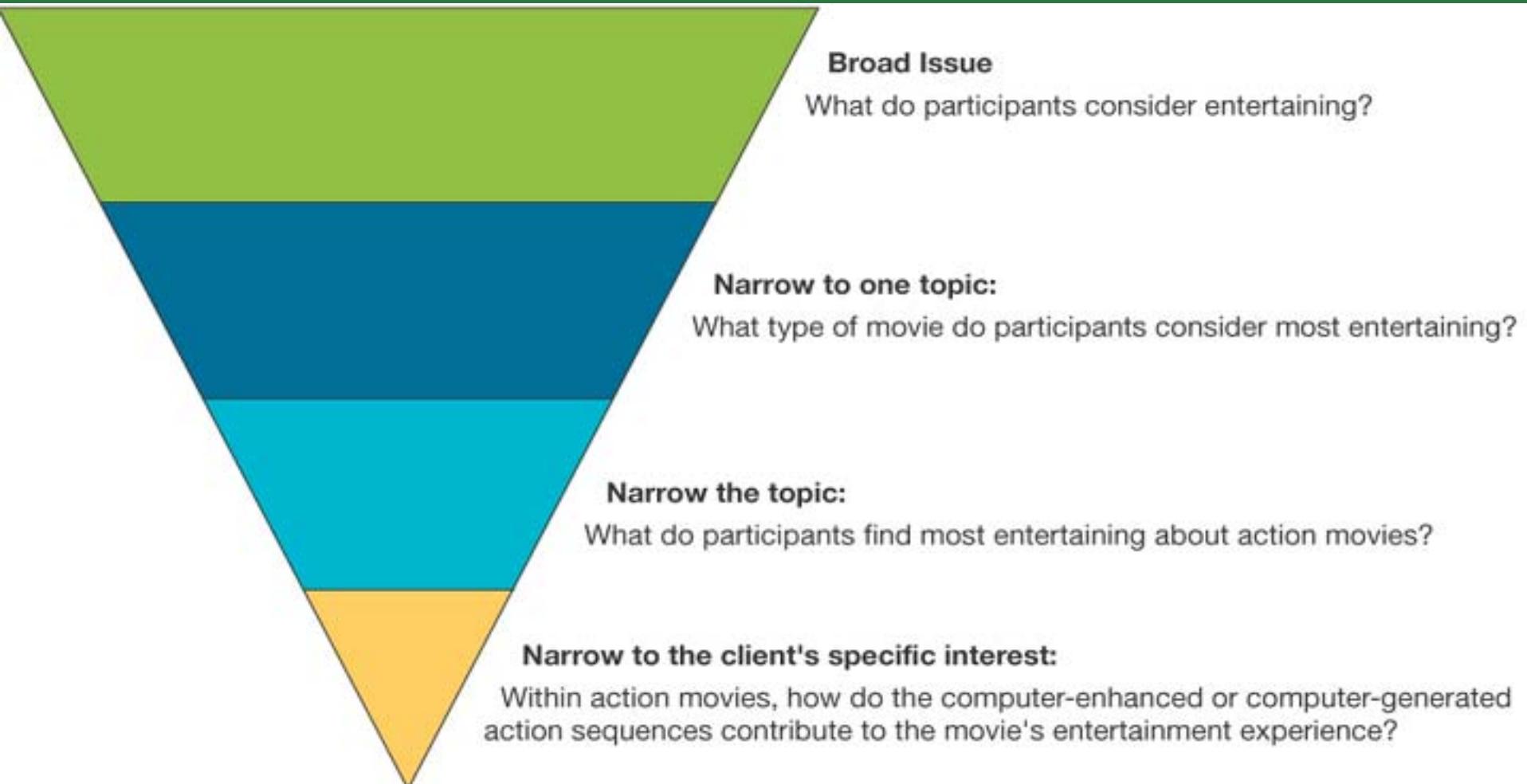
**Convenience
Sampling**

Qualitative Sampling

General sampling rule:

You should keep conducting interviews until no new insights are gained.

The Interview Question Hierarchy



Interviewer Responsibilities

- Recommends topics and questions
- Controls interview
- Plans location and facilities
- Proposes criteria for drawing sample
- Writes screener
- Recruits participants
- Develops pretasking activities
- Prepares research tools
- Supervises transcription
- Helps analyze data
- Draws insights
- Writes report

Elements of a Recruitment Screener

- Heading
- Screening requirements
- Identity information
- Introduction
- Security questions
- Demographic questions
- Behavior questions
- Lifestyle questions
- Attitudinal and knowledge questions
- Articulation and creative questions
- Offer/ Termination

Interview Formats

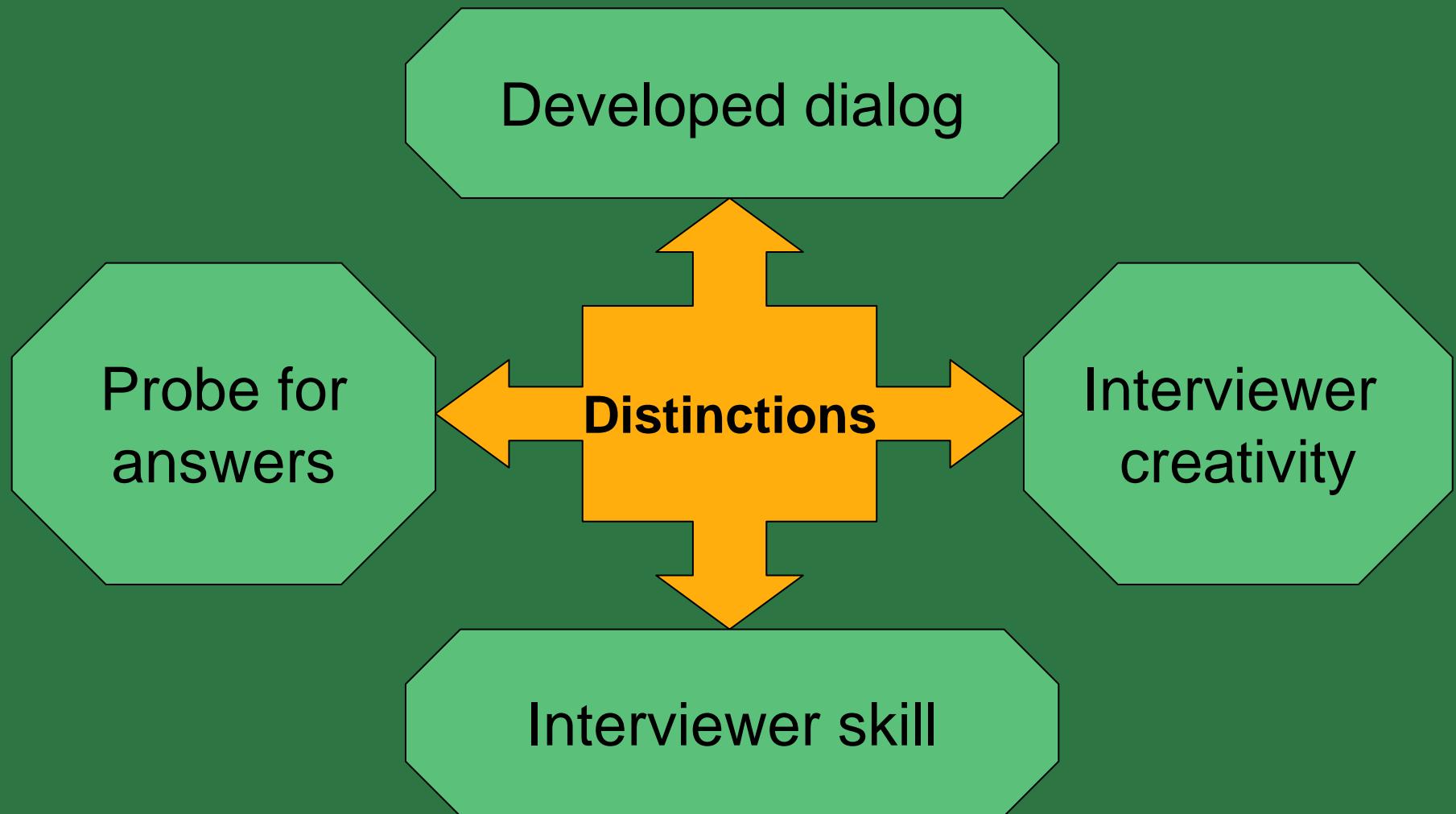
Unstructured

Semi-structured

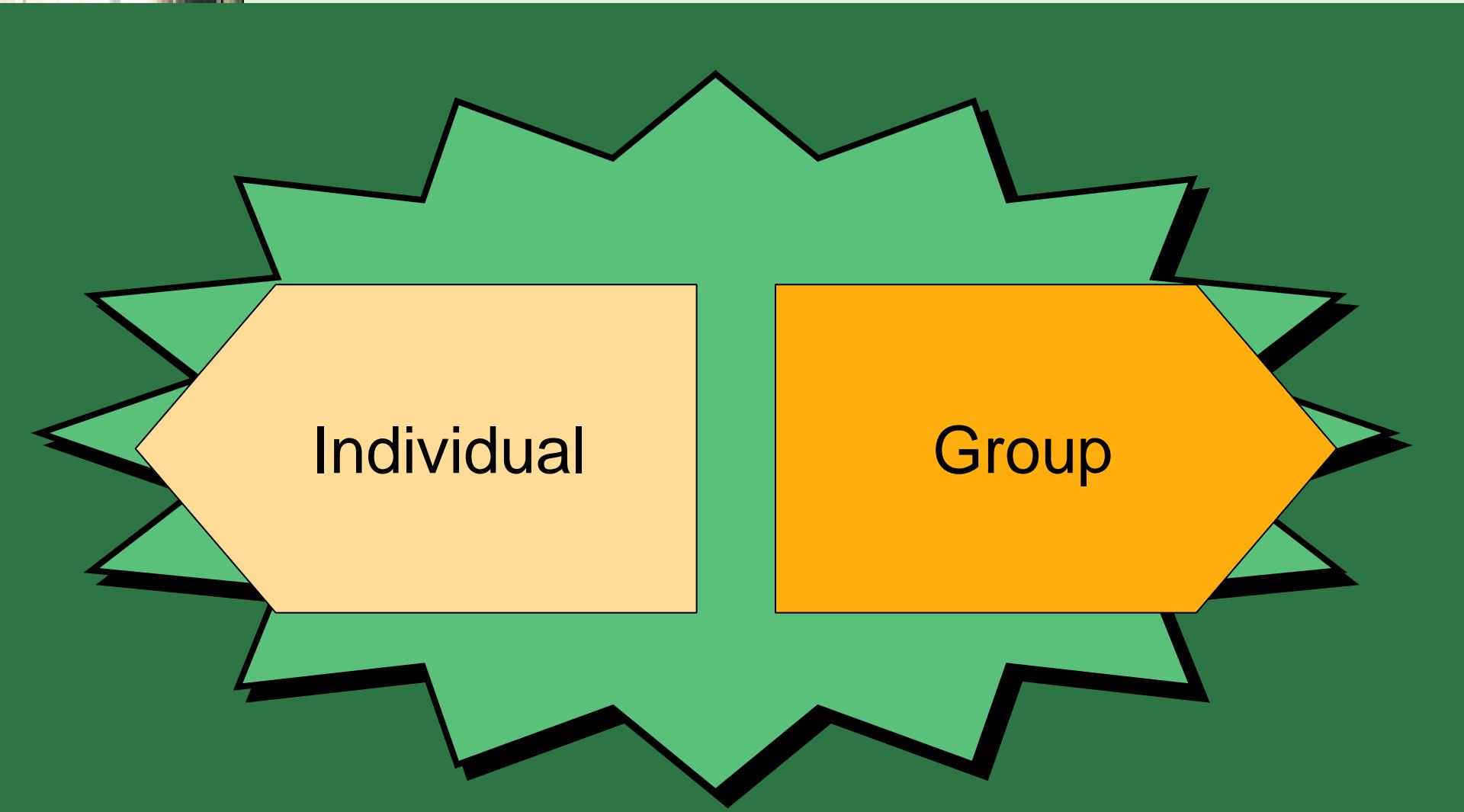
Structured



Requirements for Unstructured Interviews



The Interview Mode



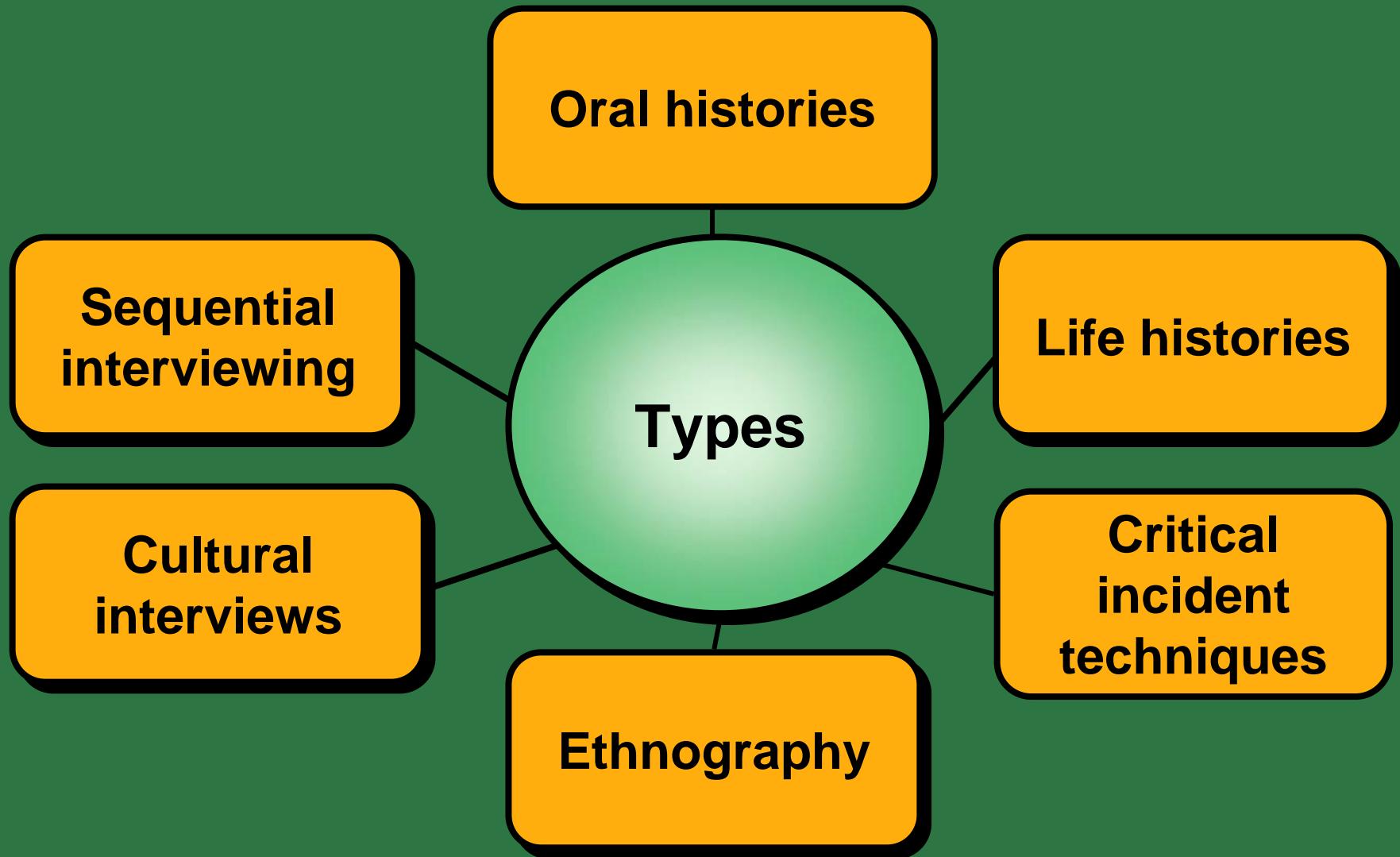
Individual

Group

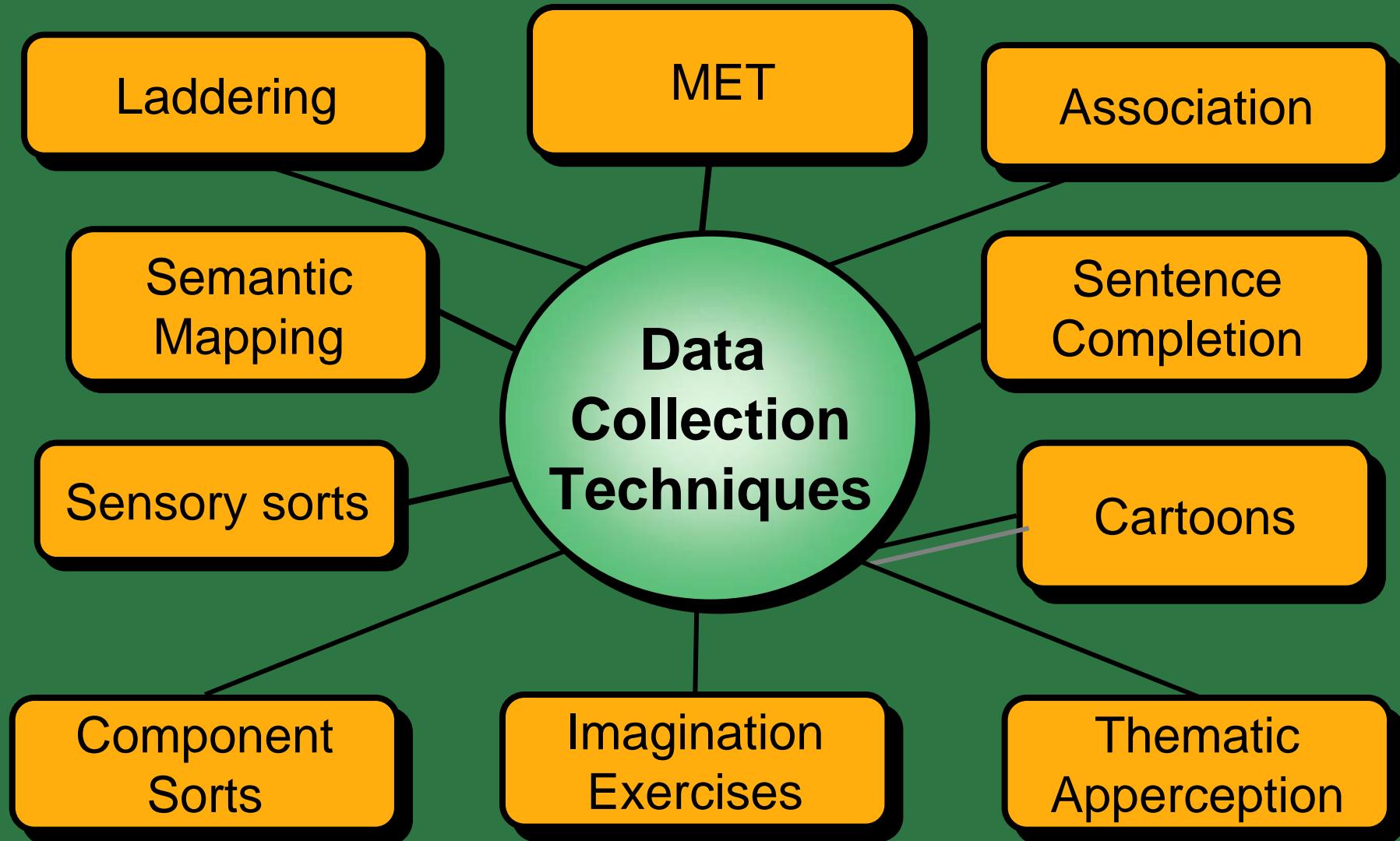
IDI vs Group

Individual Interview	Group Interview
Research Objective <ul style="list-style-type: none">• Explore life of individual in depth• Create case histories through repeated interviews over time• Test a survey	<ul style="list-style-type: none">• Orient the researcher to a field of inquiry and the language of the field• Explore a range of attitudes, opinions, and behaviors• Observe a process of consensus and disagreement
Topic Concerns <ul style="list-style-type: none">• Detailed individual experiences, choices, biographies• Sensitive issues that might provoke anxiety	<ul style="list-style-type: none">• Issues of public interest or common concern• Issues where little is known or of a hypothetical nature
Participants <ul style="list-style-type: none">• Time-pressed participants or those difficult to recruit (e.g., elite or high-status participants)• Participants with sufficient language skills (e.g., those older than seven)• Participants whose distinctions would inhibit participation	<ul style="list-style-type: none">• Participants whose backgrounds are similar or not so dissimilar as to generate conflict or discomfort• Participants who can articulate their ideas• Participants who offer a range of positions on issues

Types of Research Using IDIs

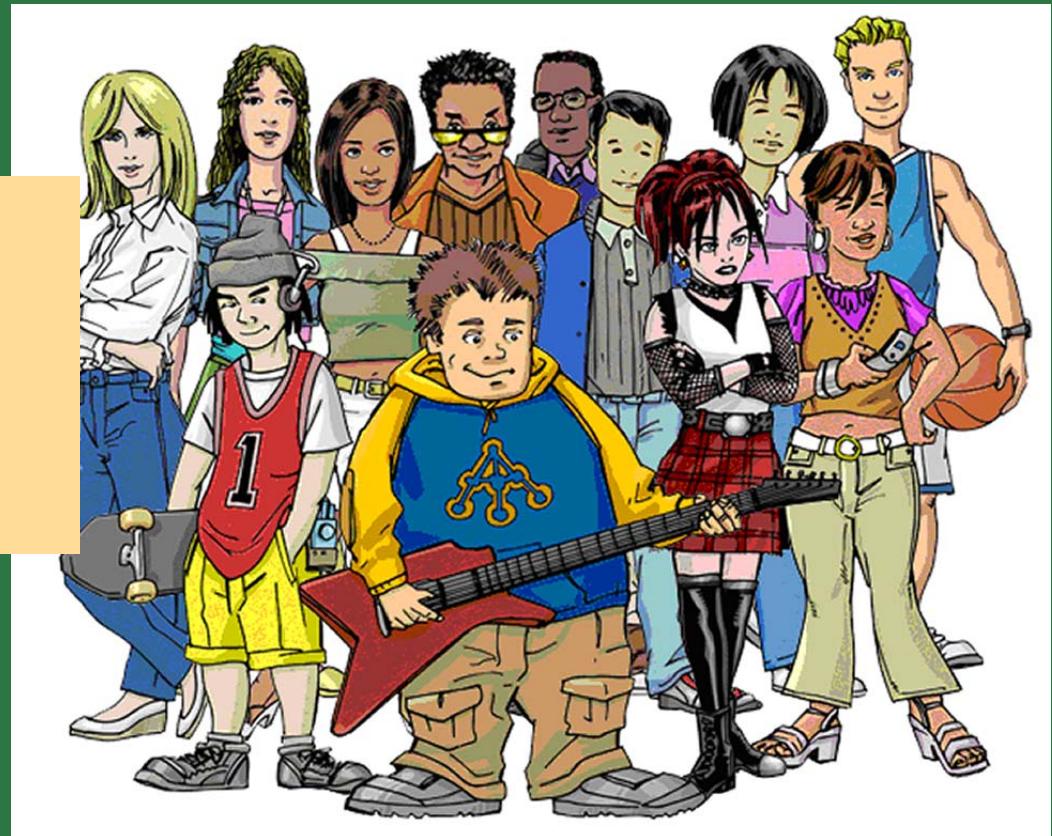


Projective Techniques



Projective Techniques

Anderson Analytics uses a cast of characters during interviewing.



Group Interviews



- Dyads
- Triads
- Mini-Groups
- Small Groups (Focus Group)
- Supergroups

Determining the Number of Groups

Scope

Number of distinct segments

Desired number of ideas

Desired level of detail

Level of distinction

Homogeneity

Group Interview Modes

The screenshot shows the FocusVision VideoMarker software interface. On the left, there is a video preview window showing a group of people in a meeting room. The video controls at the bottom include a play/pause button, a progress bar, and a timestamp of 01:27. To the right of the video are four large, rounded rectangular boxes, each containing a mode name and a list of video clips. The top box is labeled "Face-to-Face" and contains the text "Click the VideoMark button to create a new VideoMark". The second box is labeled "Telephone" and lists four clips: "Always forget to bring coupons", "New safety cap design", "Generic brand is better value", and "Close-up on easel". The third box is labeled "Online" and has a partially visible list. The bottom box is labeled "Videoconference" and also has a partially visible list. The software interface includes a menu bar with "File", "Edit", "View", "Tools", "Help", and "About", and a sidebar with buttons for "Guide", "Screener", "Profile", "Transcript", and "Help".

Face-to-Face

Click the VideoMark button to create a new VideoMark

VideoMark

Click to play VideoMark or to create a clip.

Always forget to bring coupons 00:00

New safety cap design 00:00

Generic brand is better value 00:00

Close-up on easel 00:00

Online

Videoconference

Guide

Screener

Profile

Transcript

Help

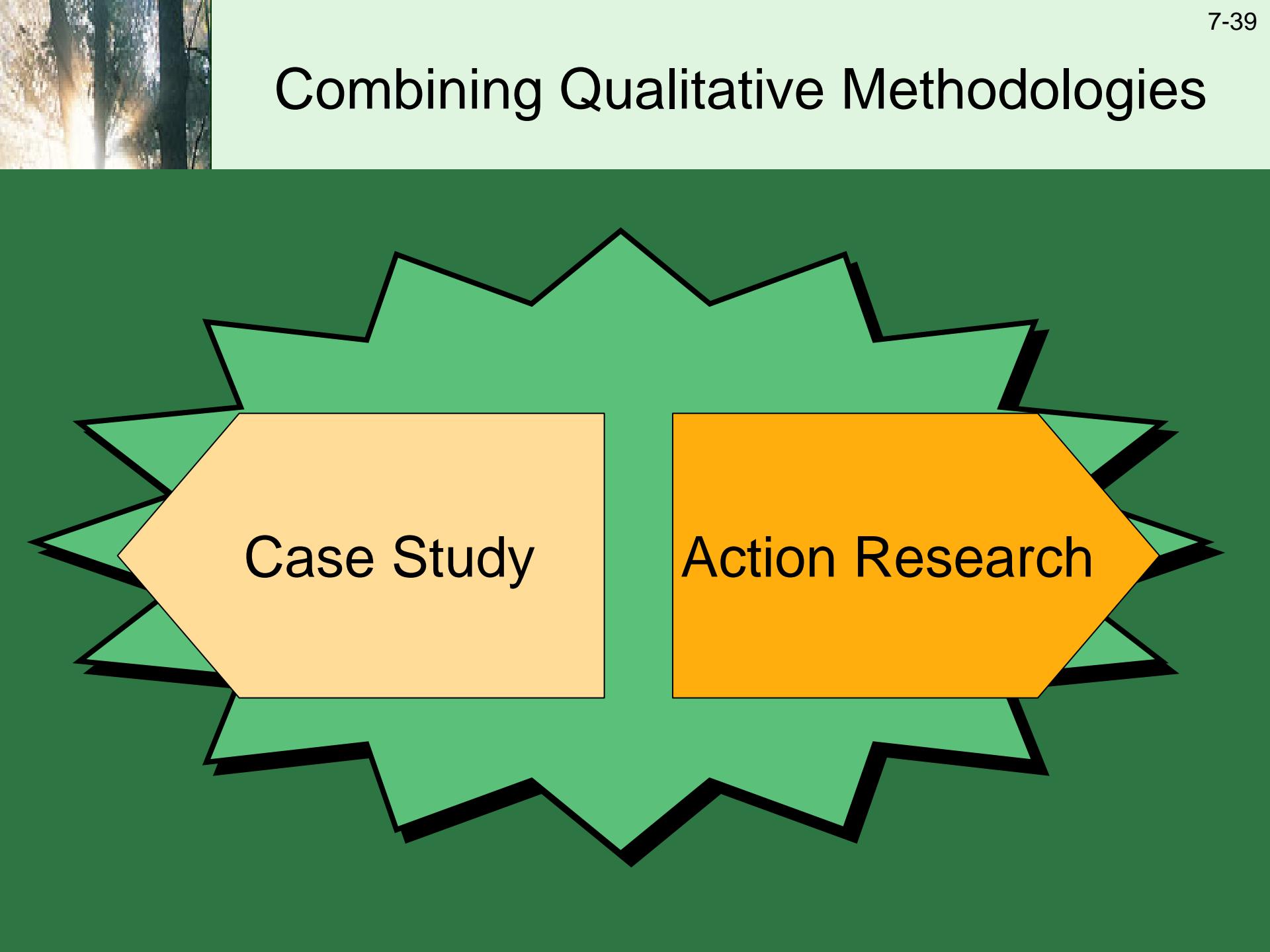
Clip: vmarkdemo 01:27

Technical Support

Review/Email/Export Clips

ver. 1.0.0

Combining Qualitative Methodologies



Case Study

Action Research

Triangulation: Merging Qualitative and Quantitative

Conduct studies simultaneously

Ongoing qualitative with multiple waves of quantitative

Perform series:
Qualitative,
Quantitative,
Qualitative

Quantitative precedes Qualitative

Key Terms

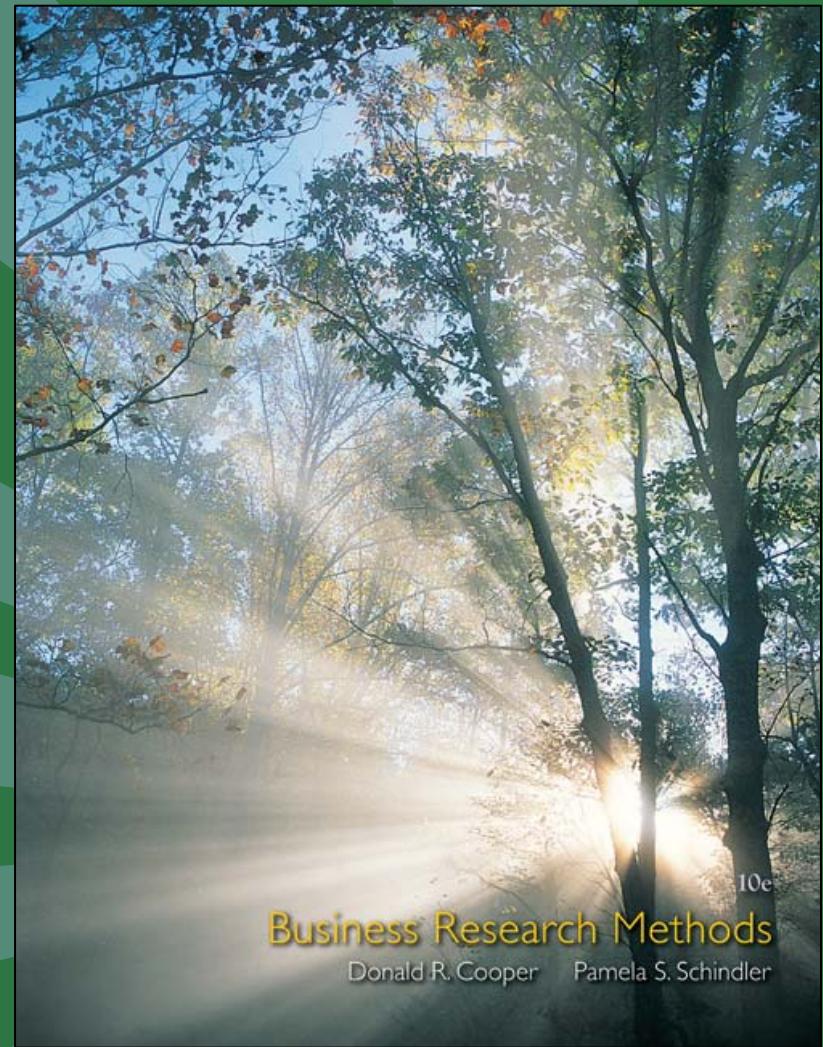
- Action research
- Case study
- CAPI
- Content analysis
- Creativity session
- Ethnography
- Focus groups
- Group interview
- IDI
 - Convergent interviewing
 - Critical incident technique
 - Cultural interviews
 - Grounded theory
 - Life histories
 - Oral history
 - Sequential interviewing
- Interview

Key Terms (cont.)

- Interview guide
- Moderator
- Non-probability sampling
- Pretasking
- Probability sampling
- Qualitative research
- Quantitative research
- Recruitment screener
- Triangulation
- Projective techniques
 - Cartoons
 - Component sorts
 - Imagination exercises
 - Laddering
 - Metaphor Elicitation Technique
 - Semantic mapping
 - Brand mapping
 - Sensory sorts
 - Sentence completion
 - Thematic Apperception Test
 - Word or picture association

Chapter 8

Observation Studies





Learning Objectives

Understand . . .

- When observation studies are most useful.
- Distinctions between monitoring, nonbehavioral and behavioral activities
- Strengths of the observation approach in research design.
- Weaknesses of the observation approach in research design.



Learning Objectives

Understand . . .

- Three perspectives from which the observer-participant relationship may be viewed.
- Various designs of observation studies.

PulsePoint: Research Revelation

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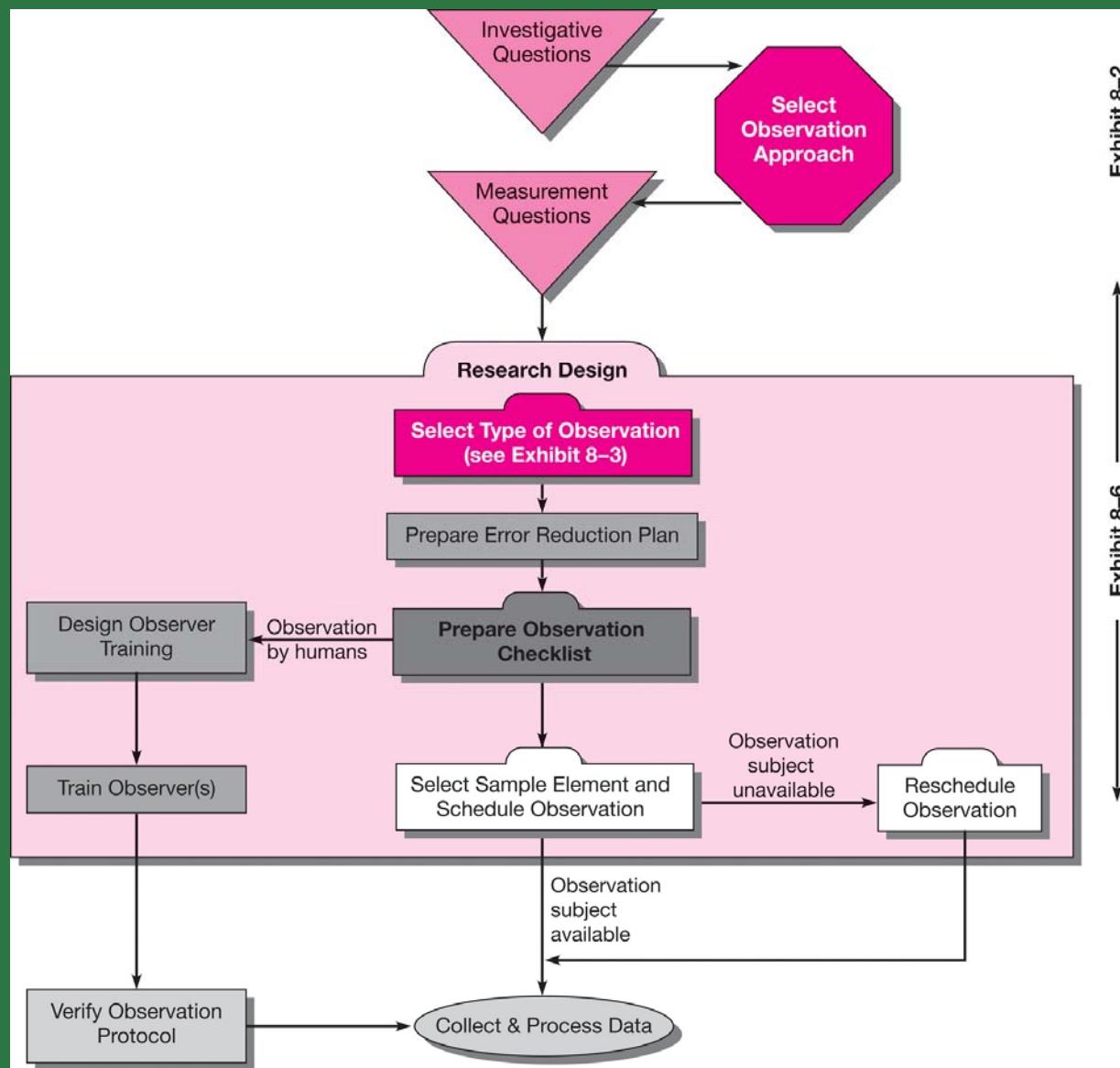
The number, in millions, of adult Internet users who will bank online by 2011.

RFID Changes Monitoring

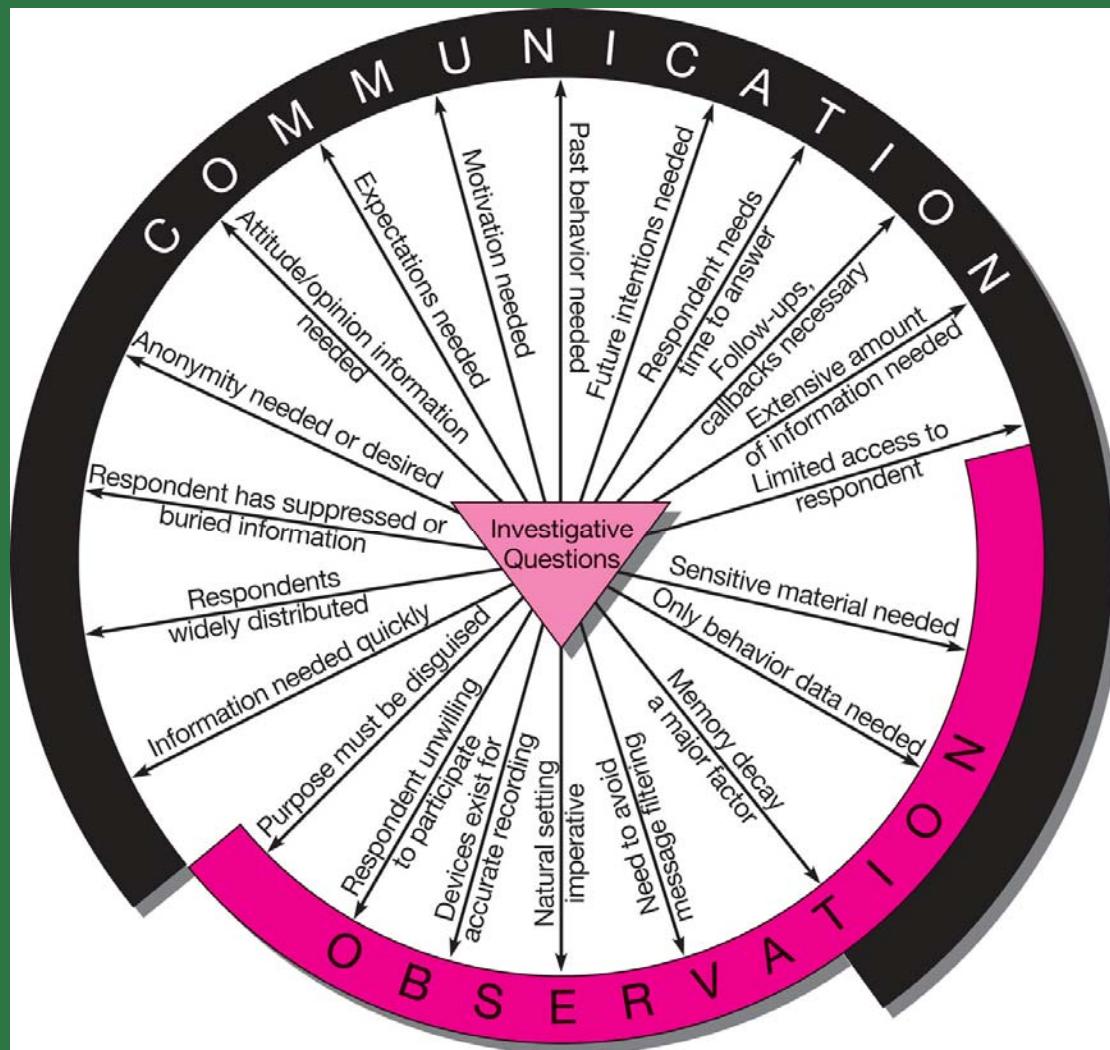
“We can certainly understand and appreciate consumer concern about privacy. That’s why we want our customers to know that RFID tags will not contain nor collect any additional data about our customers. In fact in the foreseeable future, there won’t even be any RFID readers on our stores’ main sales floors.”

*Linda Dillman, EVP & Chief Information Officer,
Wal-Mart*

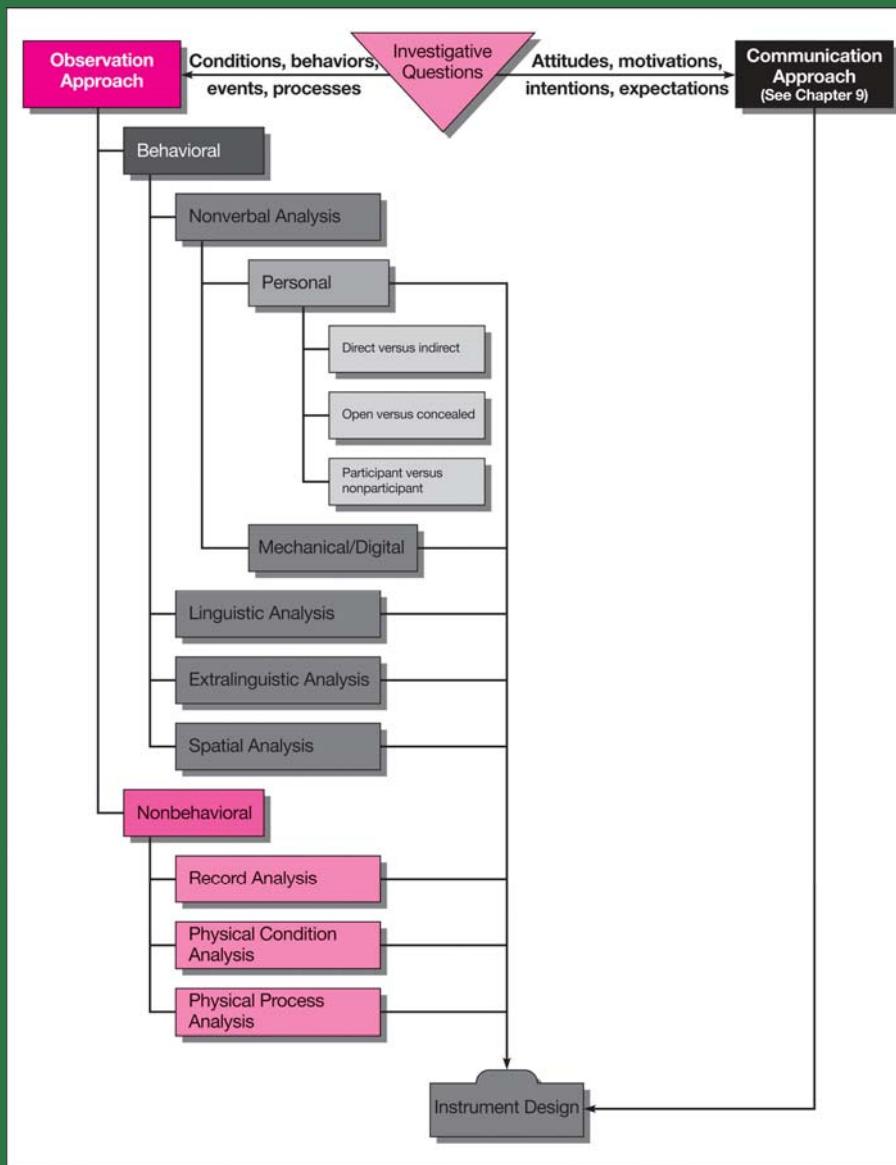
Observation and the Research Process



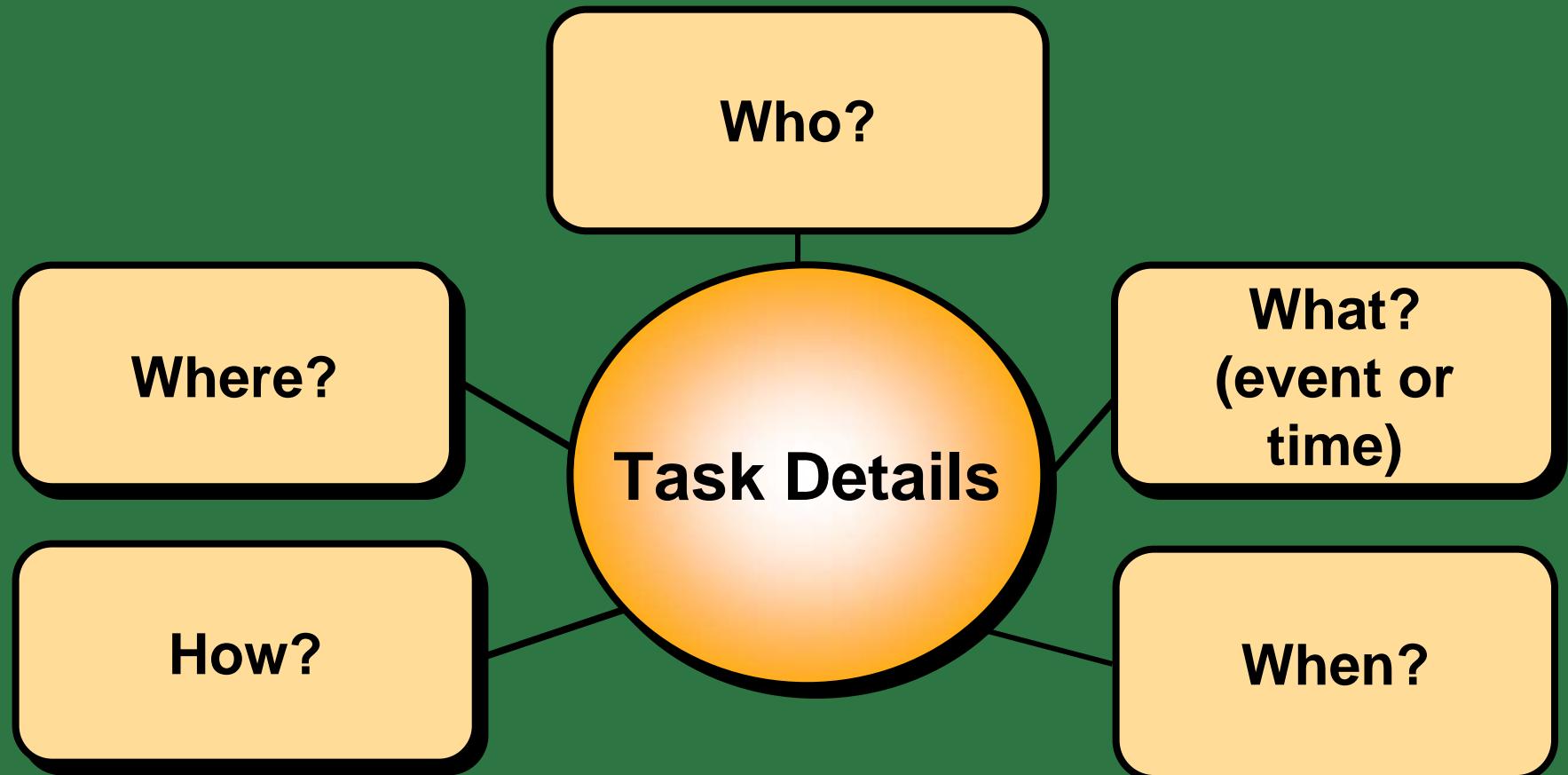
Selecting the Data Collection Method



Selecting an Observation Data Collection Approach



Research Design



Observation Location



Content of Observation

Factual	Inferential
Introduction/identification of salesperson and customer.	Credibility of salesperson. Qualified status of customer.
Time and day of week.	Convenience for the customer. Welcoming attitude of the customer
Product presented.	Customer interest in product.
Selling points presented per product.	Customer acceptance of selling points of product.
Number of customer objections raised per product.	Customer concerns about features and benefits.
Salesperson's rebuttal of objection.	Effectiveness of salesperson's rebuttal attempts.
Salesperson's attempt to restore controls.	Effectiveness of salesperson's control attempt. Consequences for customer who prefers interaction.
Length of interview.	Customer's/salesperson's degree of enthusiasm for the interview.
Environmental factors interfering with the interview.	Level of distraction for the customer.
Customer purchase decision.	General evaluation of sale presentation skill.

Data Collection

Watching

Listening

Touching

Smelling

Reading



Using Observation

Systematic planning

Properly controlled

Consistently dependable

Accurate account of events



Observation Classification

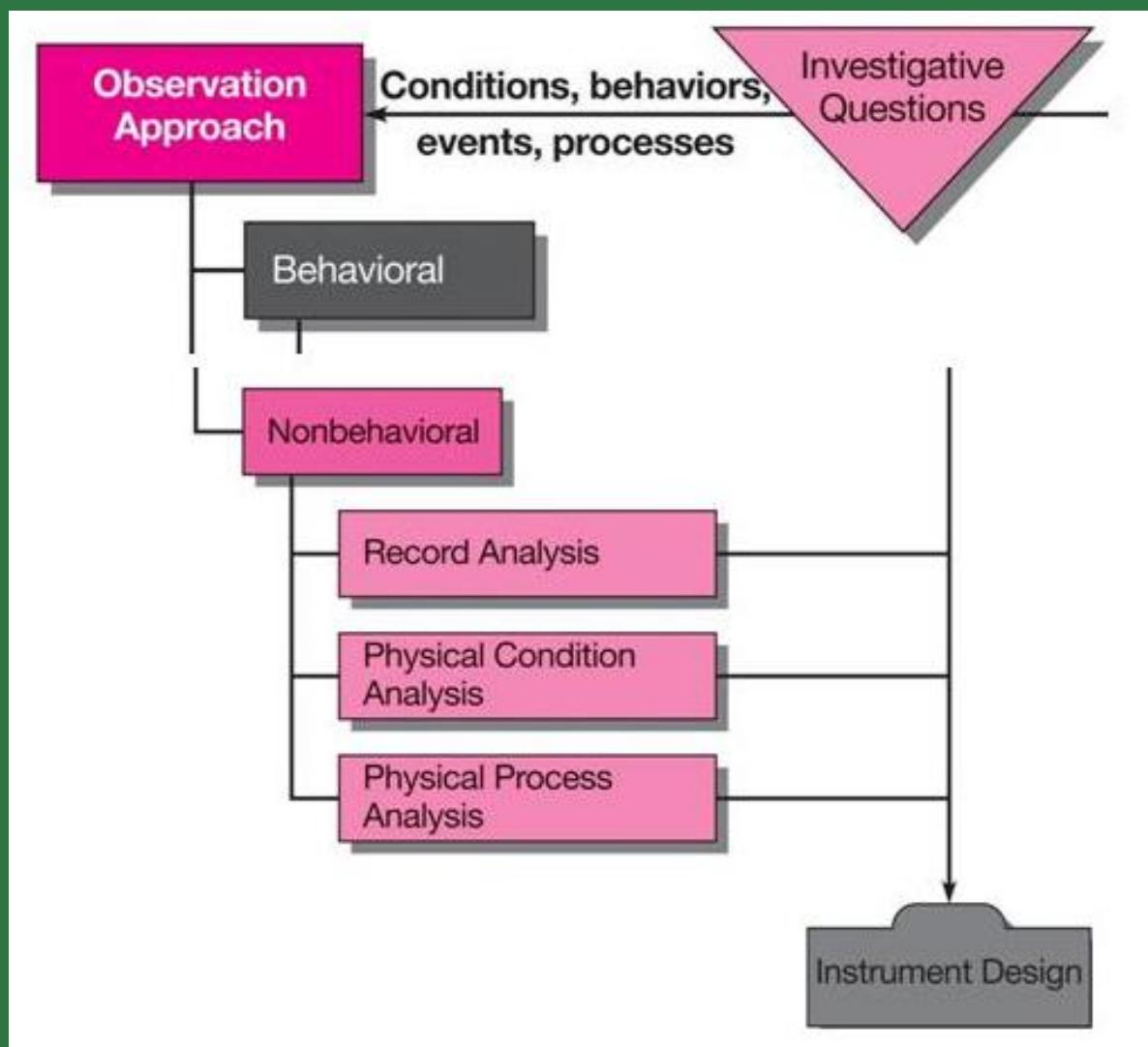
Nonbehavioral

- Physical condition analysis
- Process or Activity analysis
- Record analysis

Behavioral

- Nonverbal
- Linguistic
- Extralinguistic
- Spatial

Selecting an Observation Data Collection Approach . . .**Nonbehavioral**



Nonbehavioral Observation

Customers Who Owe Money

Customer ID	Customer Name	Amount Due	Due Date
OWDEN	Snowden Interior Design	\$7,102.00	9/12/2008
AWRIGHT	Seawright Sod and Lawn Care	\$49.99	9/18/2008
COMA	Tacoma Park Golf Course	\$1,049.01	10/2/2008
ESDALE	Teesdale Real Estate	\$5,238.12	10/12/2008
URMAN	Thurman Golf Course Design	\$9,998.00	10/17/2008
ERLY	Everly Property Management	\$8,697.32	10/24/2008

New Sales Invoices List
Write Letters to Customers

Aged Payables

Key	Days Overdue	Amount
Green	0 - 30	\$41,167.1
Blue	31 - 60	\$35,476.5
Yellow	61 - 90	\$2,102.7
Red	Over 90 days	\$0.00
	Total	\$78,746.41

New Vendor List
New Aged Payables Report

New Customers: Last Twelve Months

Customer ID	Customer Name
HOLLAND	Holland Properties, Inc.
ARMSTRONG	Armstrong Landscaping

Record Analysis

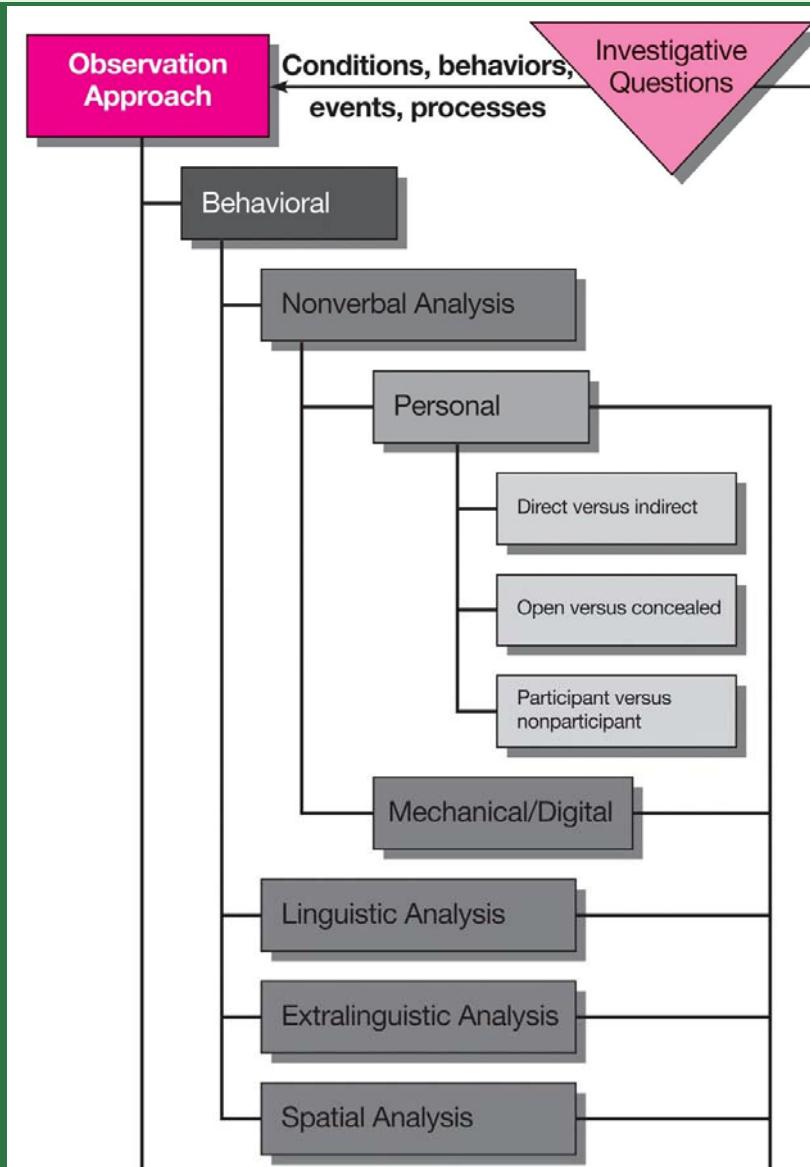
Physical Condition Analysis

Physical Process Analysis

Wal-Mart Implements Use of RFID Labels



Selecting an Observation Data Collection Approach... **Behavioral**



Behavioral Observation

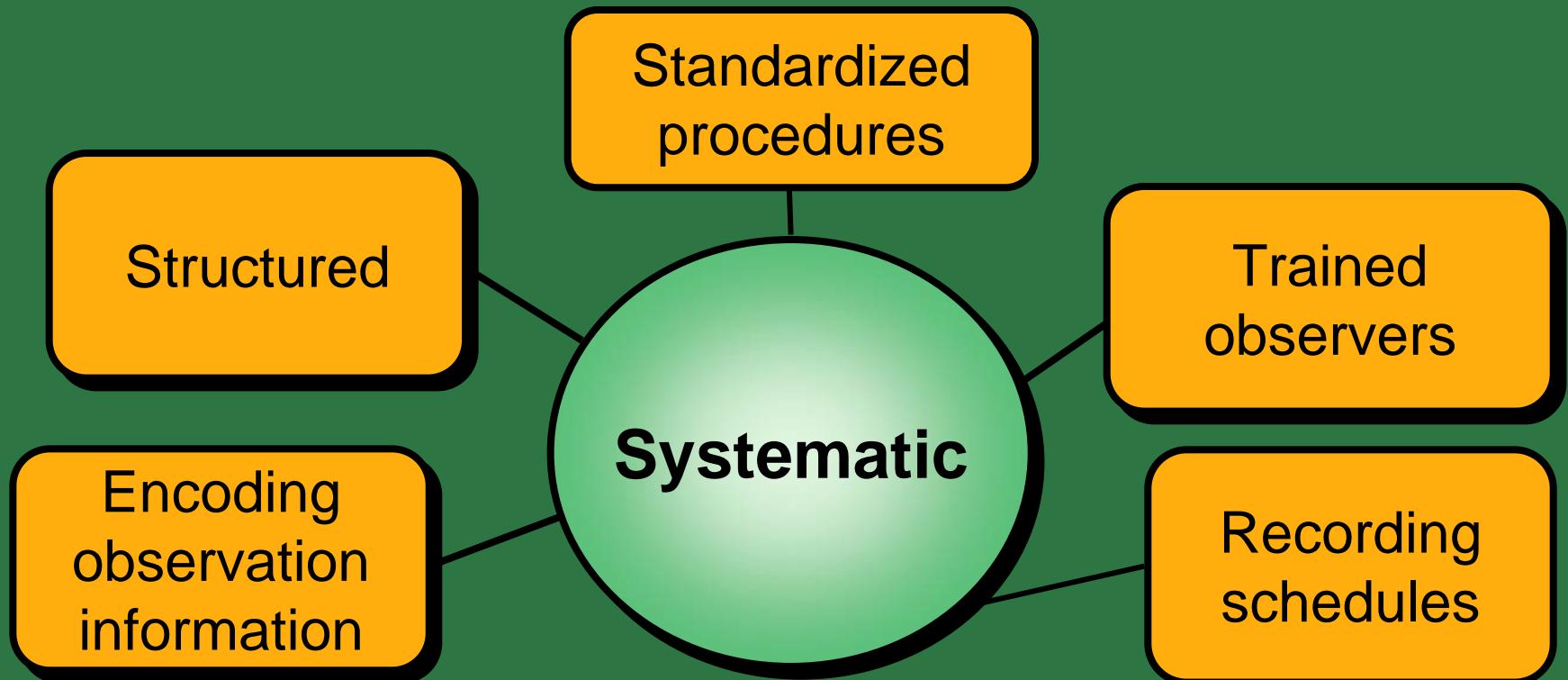


- **“We noticed people scraping the toppings off our pizza crusts. We thought at first there was something wrong, but they said, ‘We love it, we just don’t eat the crust anymore.’”**

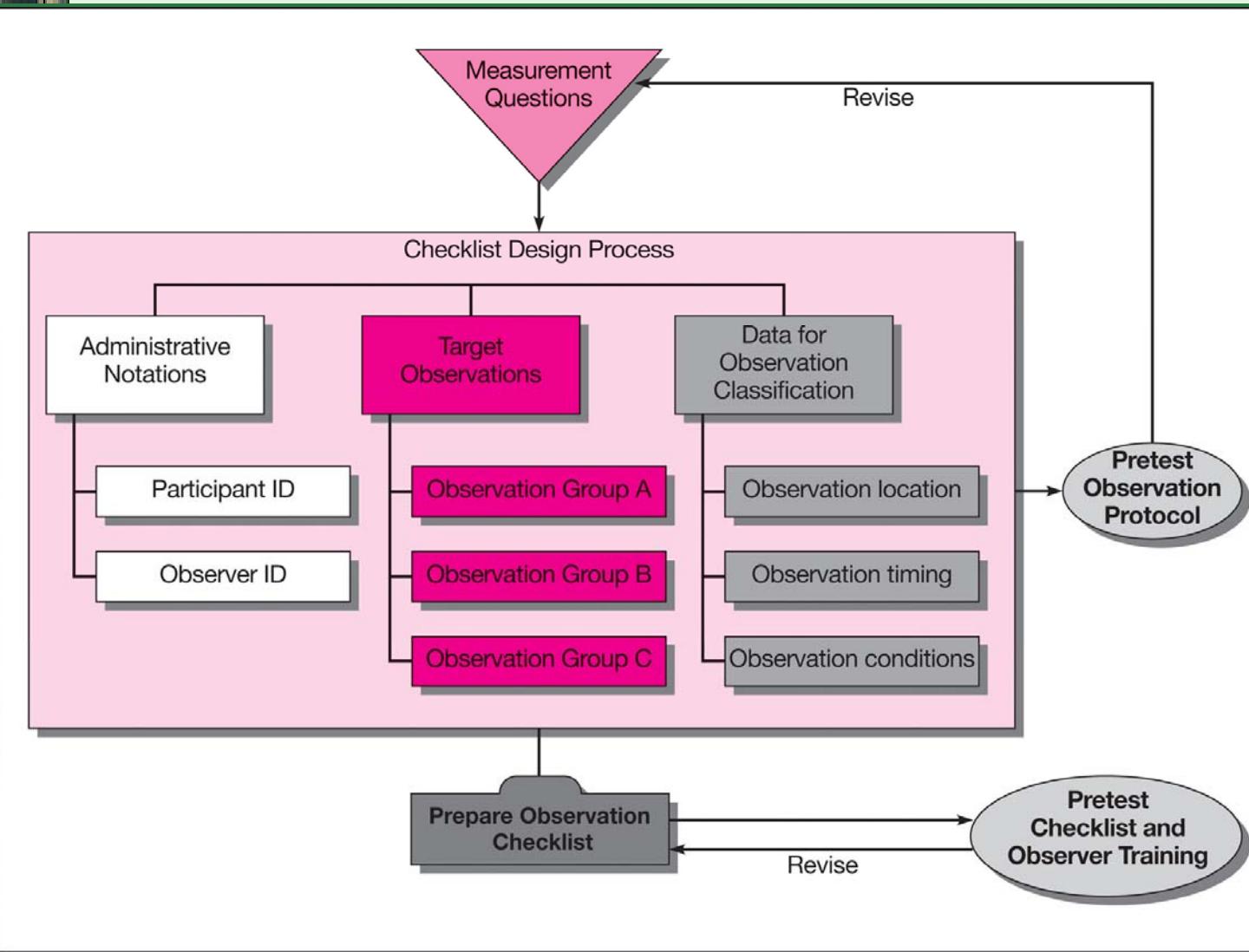
– Tom Santor, Donatos Pizza

Donatos
Takes the P.I.E. **Pizzeria**
PMQ's Pizza Industry Enterprise of the Year

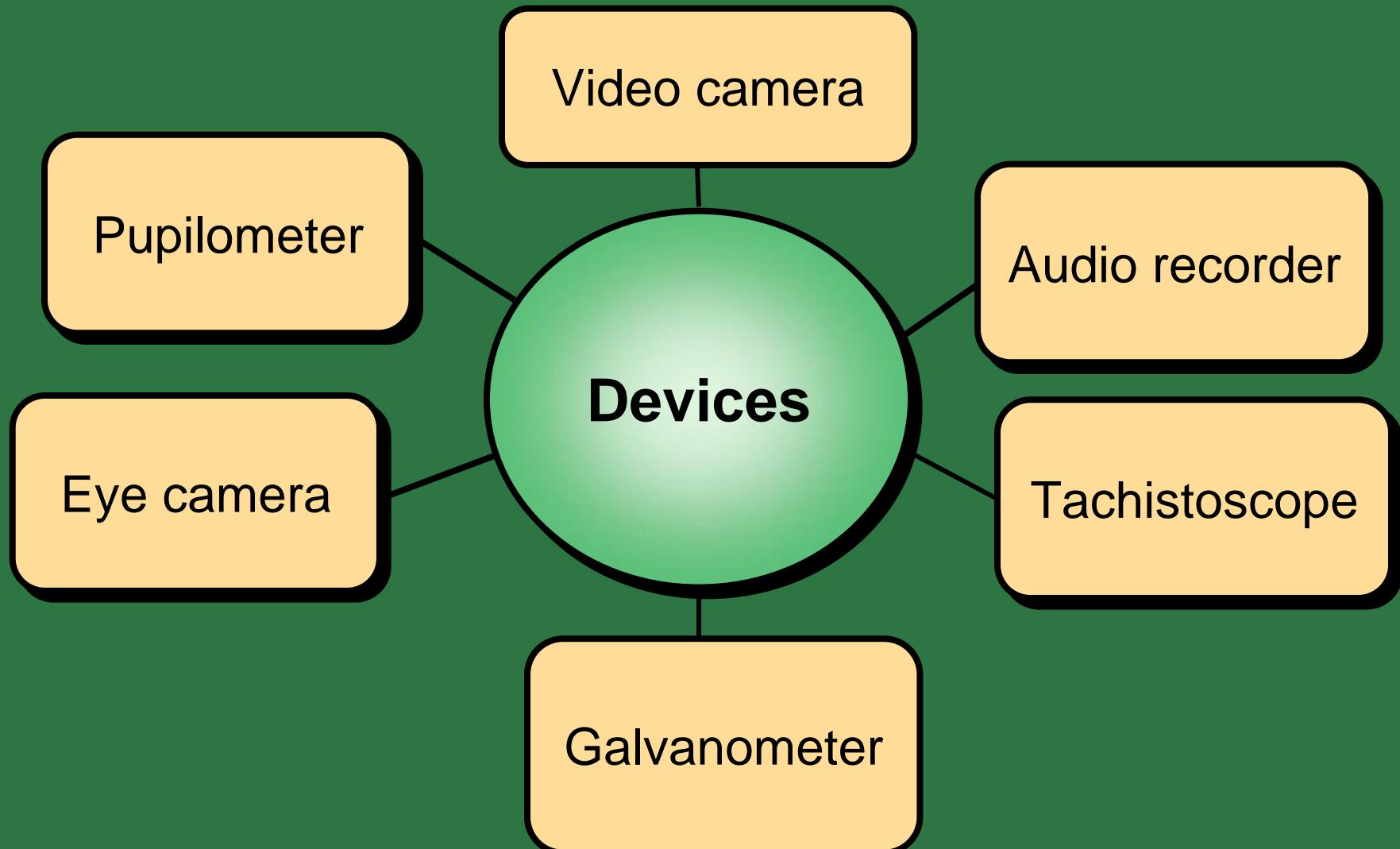
Systematic Observation



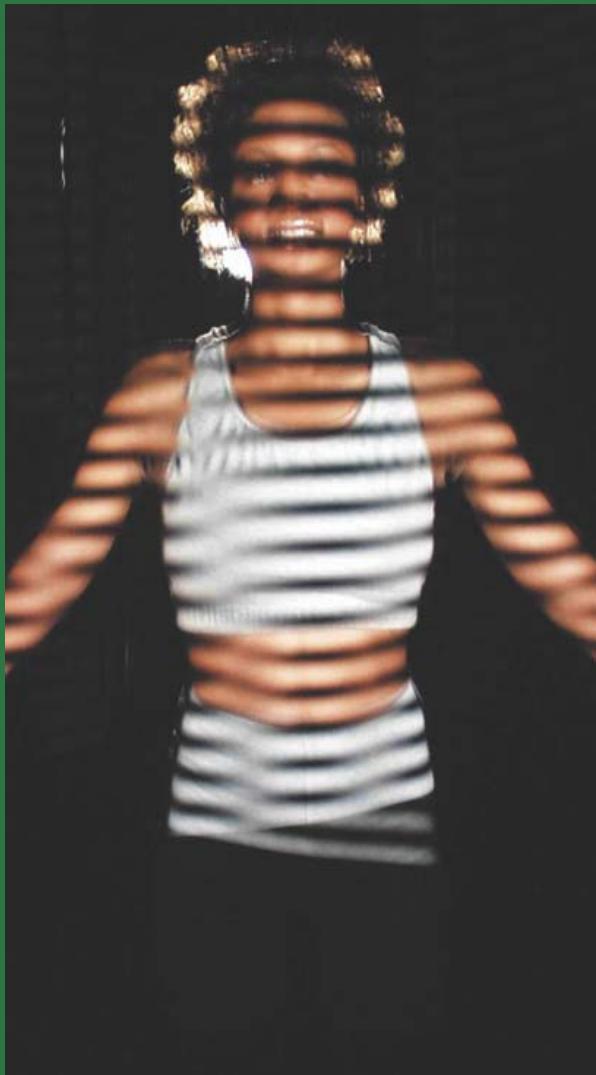
Flowchart for Checklist Design



Mechanical/ Digital Behavioral Observation



SizeUSA



Body Measurement System

Portable People Meters



Observer-Participant Relationship

Direct or indirect observation

Presence is known or unknown

Observer involved or not involved in events



Extralinguistic Observation



Vocal

Temporal

Interaction

Verbal Stylistic

Desired Characteristics for Observers

It's all about
the kids

Akron
Children's
Hospital
akronchildrens.org

akronchildrens.org

604 nurses who keep the monsters away

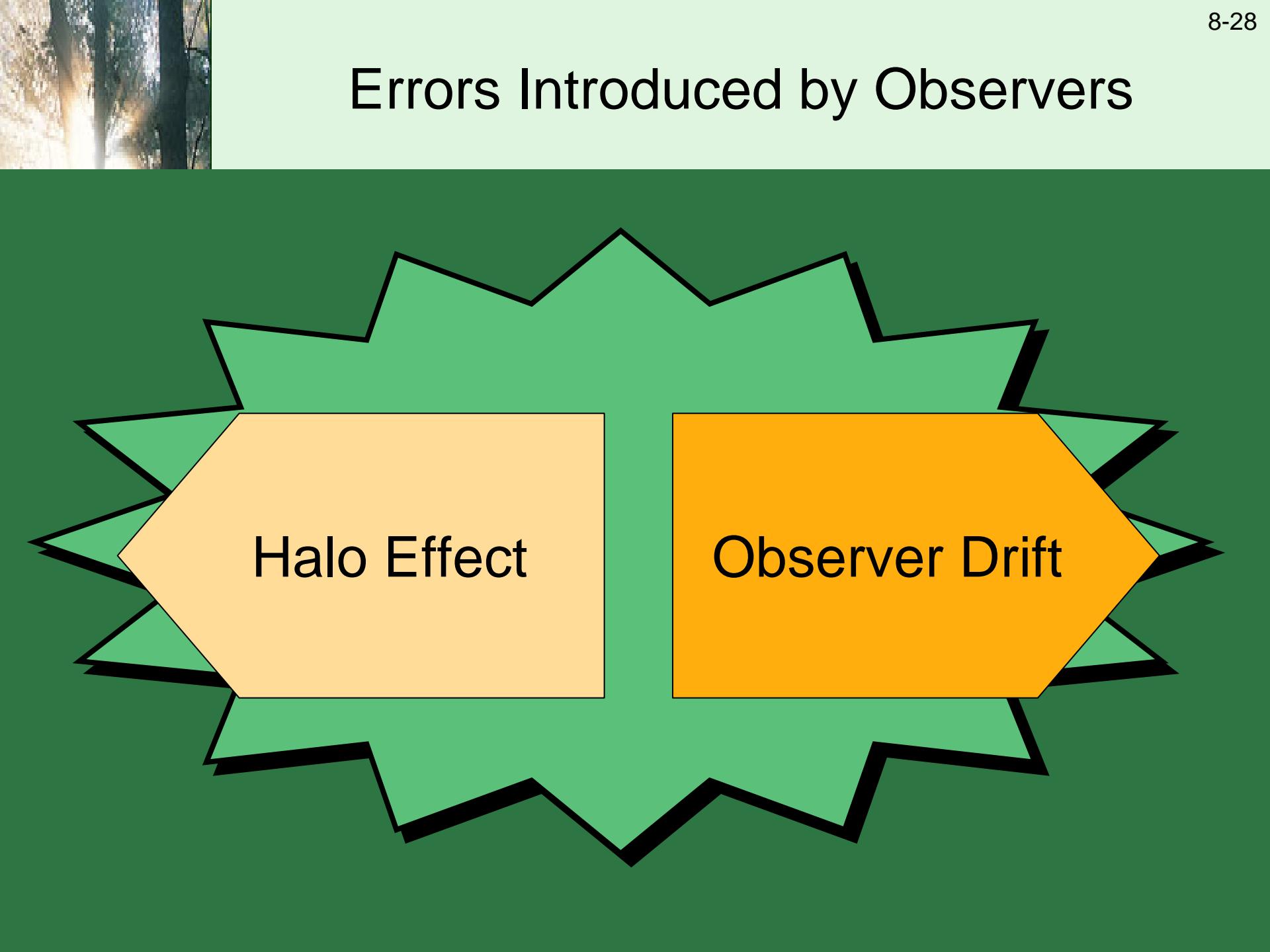
Concentration

Detail-oriented

Unobtrusive

Experience level

Errors Introduced by Observers



Halo Effect

Observer Drift

Evaluation of Behavioral Observation

Strengths

- Securing information that is otherwise unavailable
- Avoiding participant filtering/ forgetting
- Securing environmental context
- Optimizing naturalness
- Reducing obtrusiveness

Weaknesses

- Enduring long periods
- Incurring higher expenses
- Having lower reliability of inferences
- Quantifying data
- Keeping large records
- Being limited on knowledge of cognitive processes

Key Terms

- Concealment
- Event sampling
- Halo effect

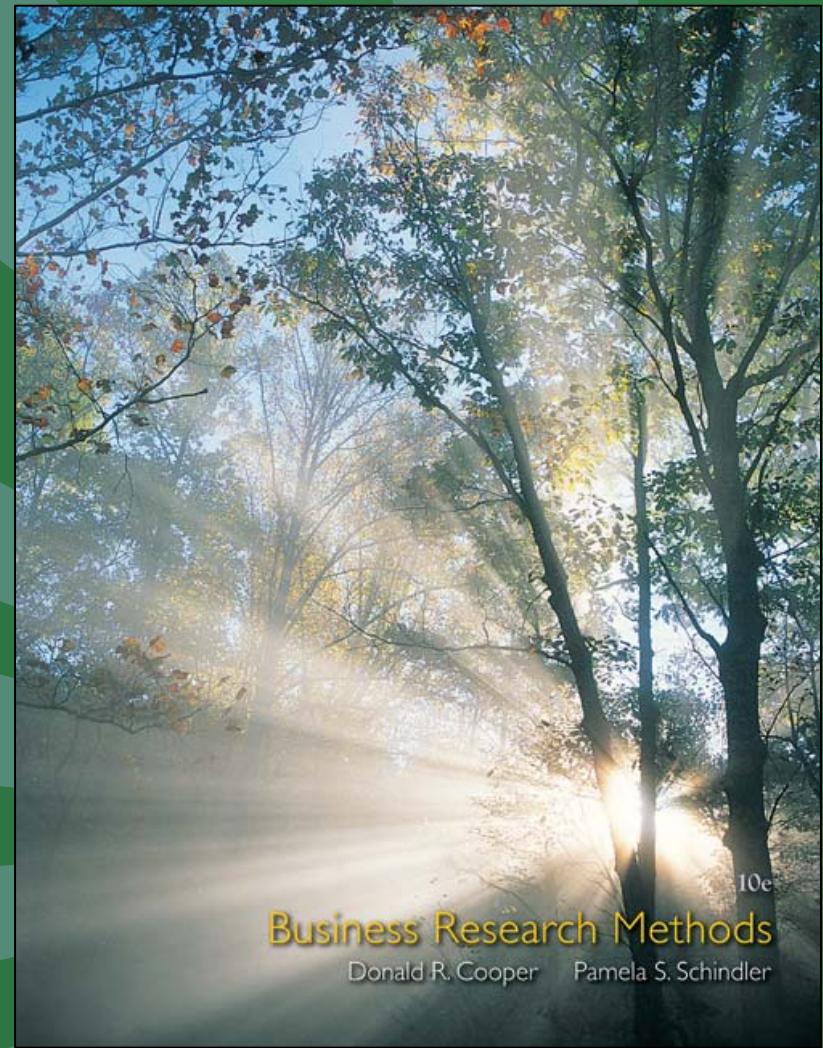
- Observation
 - Direct
 - Extralinguistic
 - Indirect
 - Linguistic
 - Nonverbal
 - Participant
 - Simple
 - Spatial
 - systematic

Key Terms

- Observation checklist
- Observer drift
- Physical condition analysis
- Physical trace
- Process (activity) analysis
- Reactivity response
- Record analysis
- Spatial Relationships
- Time sampling
- Unobtrusive measures

Chapter 9

Surveys





Learning Objectives

Understand . . .

- The process for selecting the appropriate and optimal communication approach.
- Factors affect participation in communication studies.
- Sources of error in communication studies and how to minimize them.
- Major advantages and disadvantages of the three communication approaches.
- Why an organization might outsource a communication study.

PulsePoint: Research Revelation

41

The percent of business executives that believe that job loss and off-shoring will have the most impact on shareholder value in their industries in the next five years.

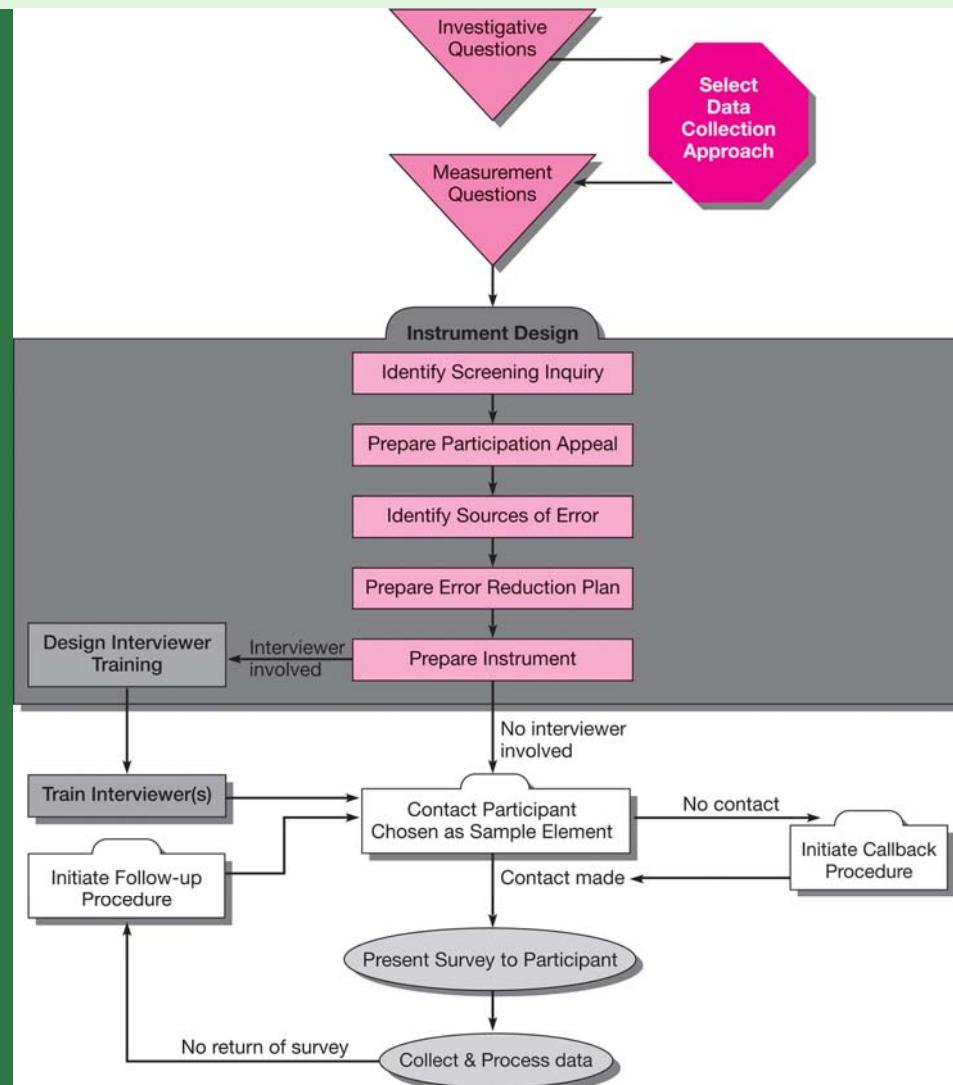


Dilemma for Surveys

“The ubiquity of cell phones and the rapid and continuing development of the Internet have completely altered the way we talk to each other, the way marketers talk to customers, the way customers shop and the way the media research their audiences.”

*Alain Tessier , founder,
Mediamark Research, Inc.*

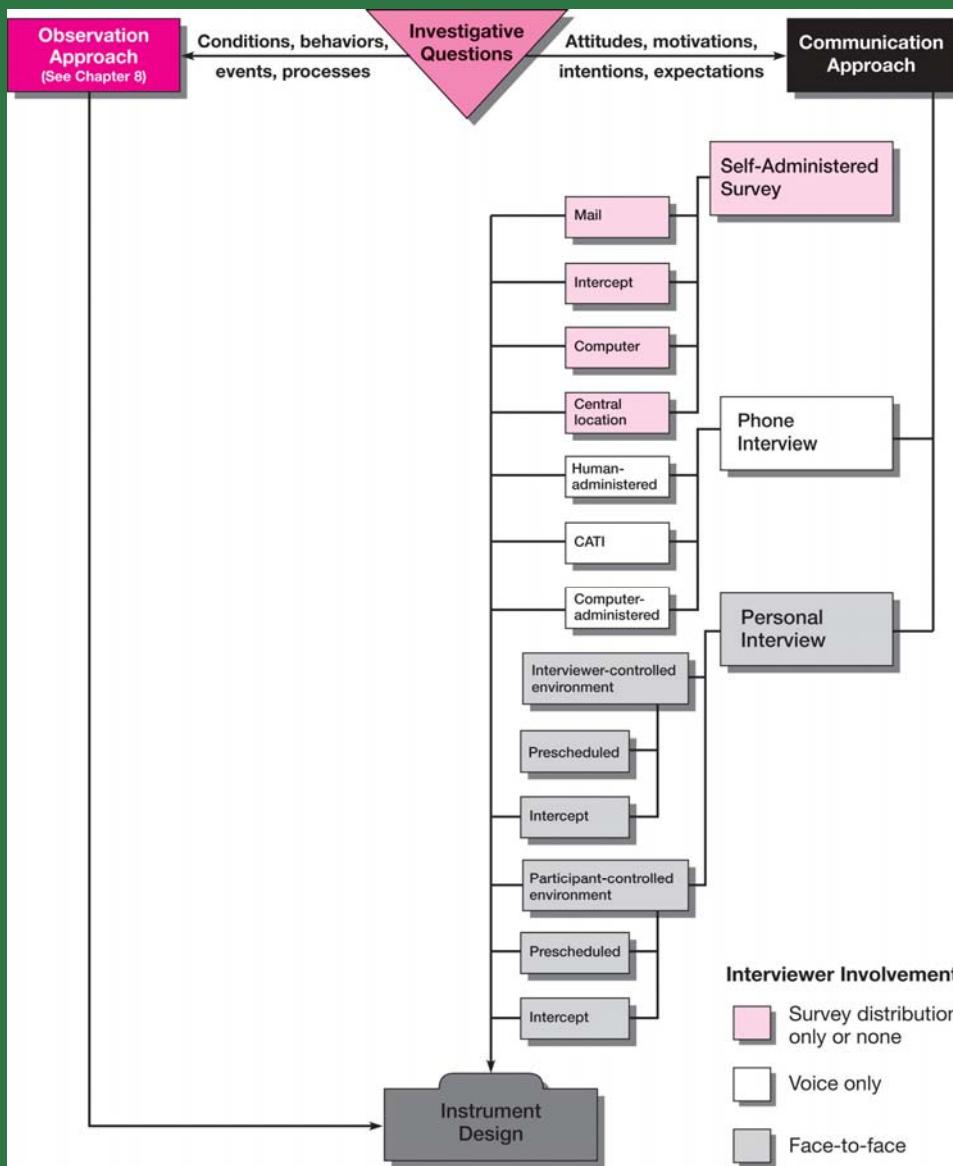
Data Collection Approach



Part A

Part B

Selecting a Communication Data Collection Approach



Communication Approach

Strengths

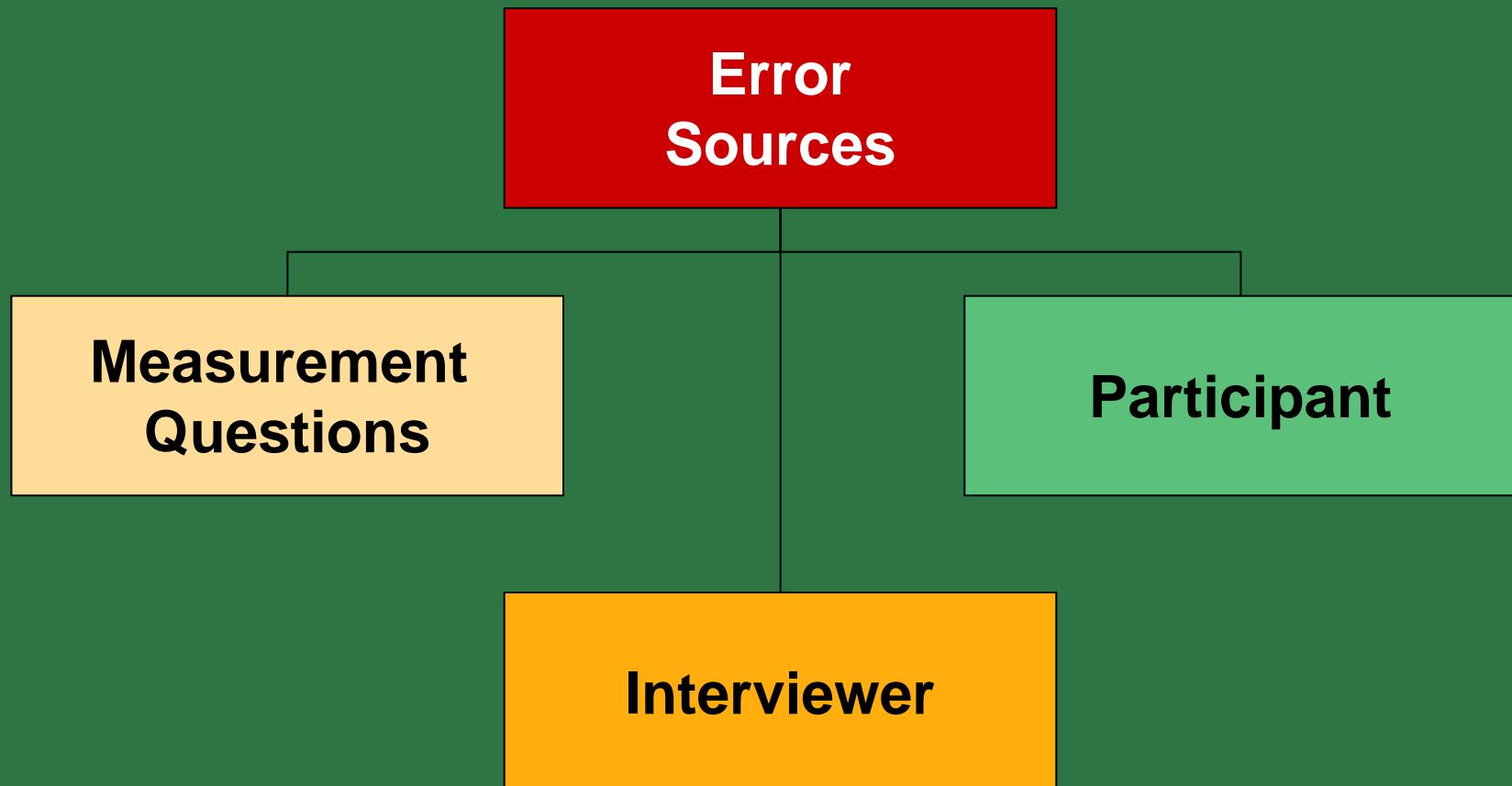
- Versatility
- Efficiency
- Geographic coverage

Weaknesses

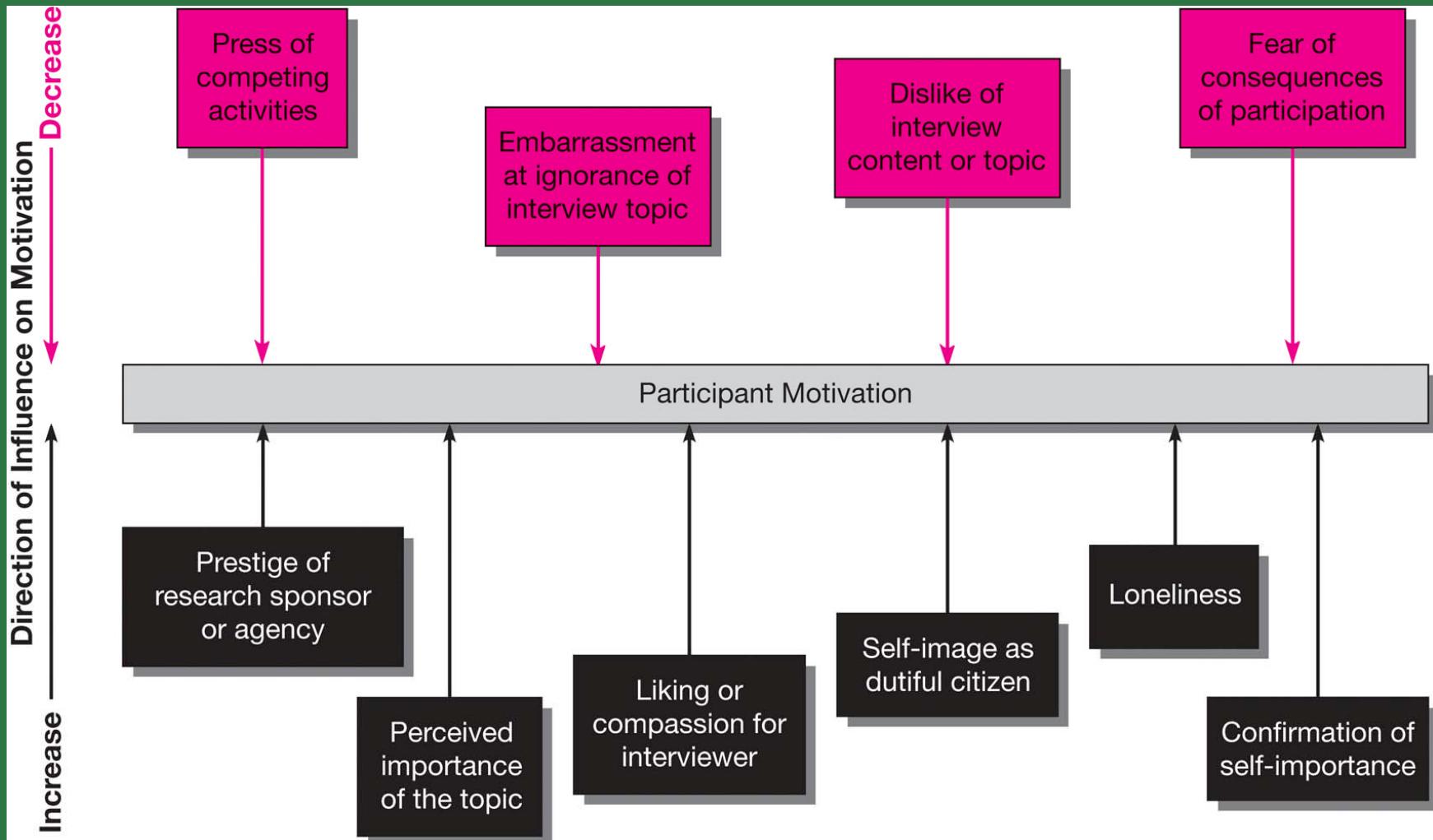
- Error
- Inaccessible populations



Sources of Error



Participant Motivation

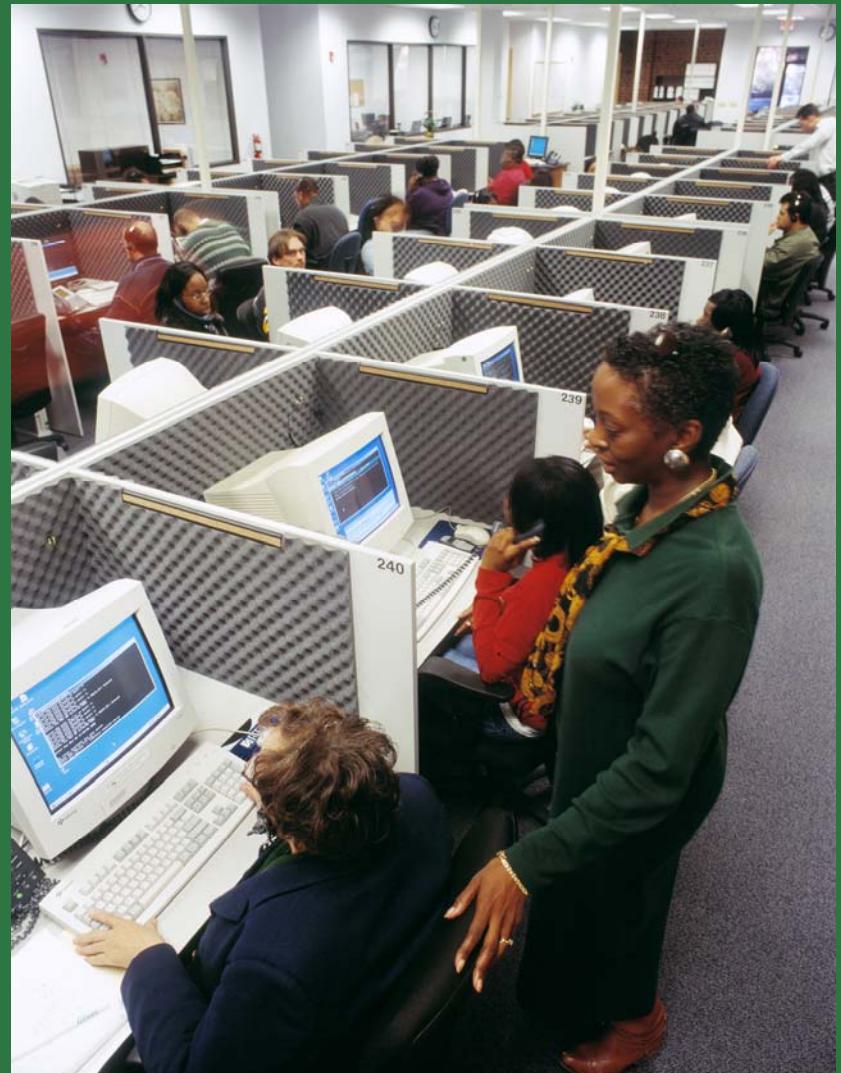


Response Terms

Noncontact rate

Refusal rate

Incidence rate



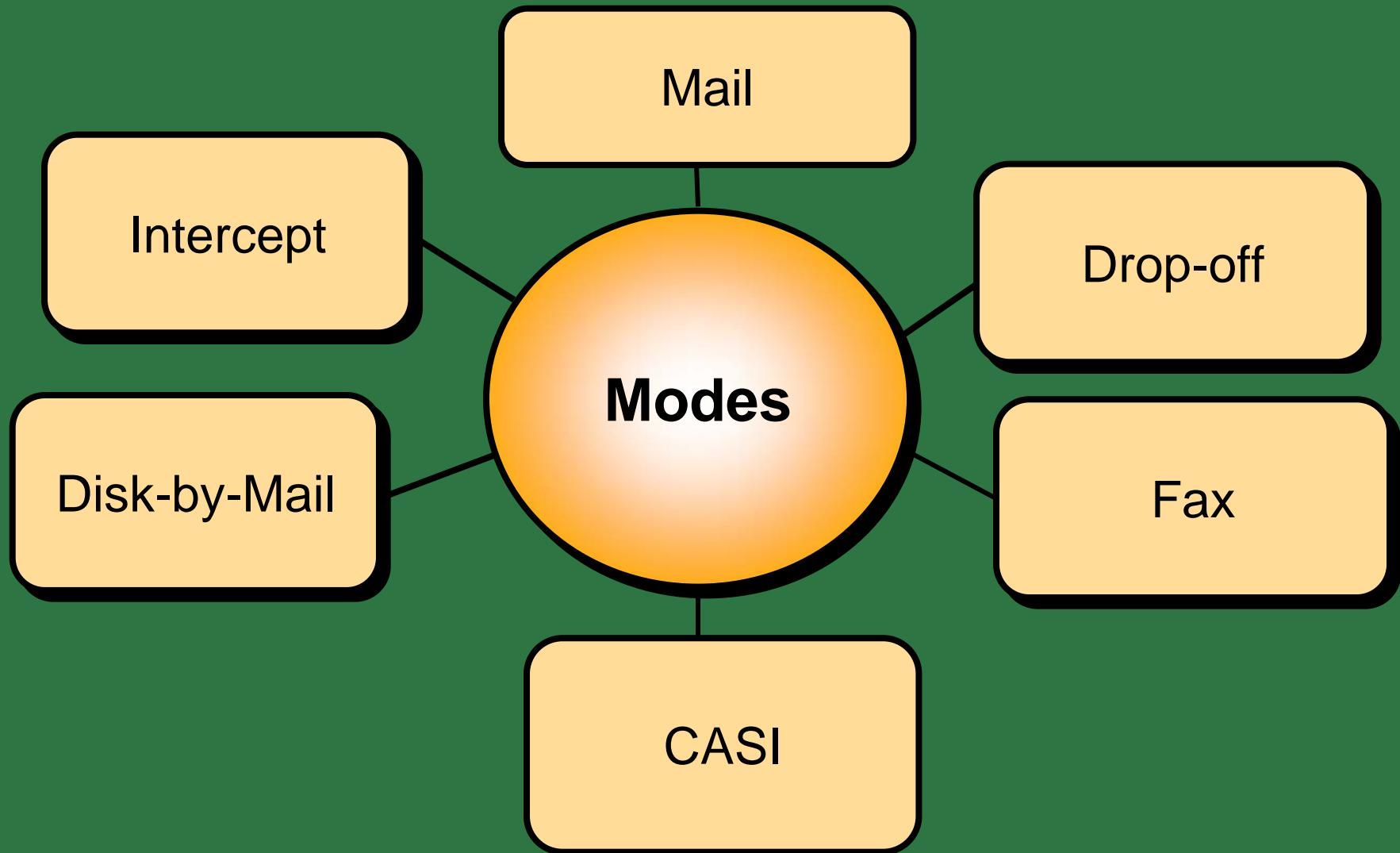
Communication Approaches

**Self-
Administered
Survey**

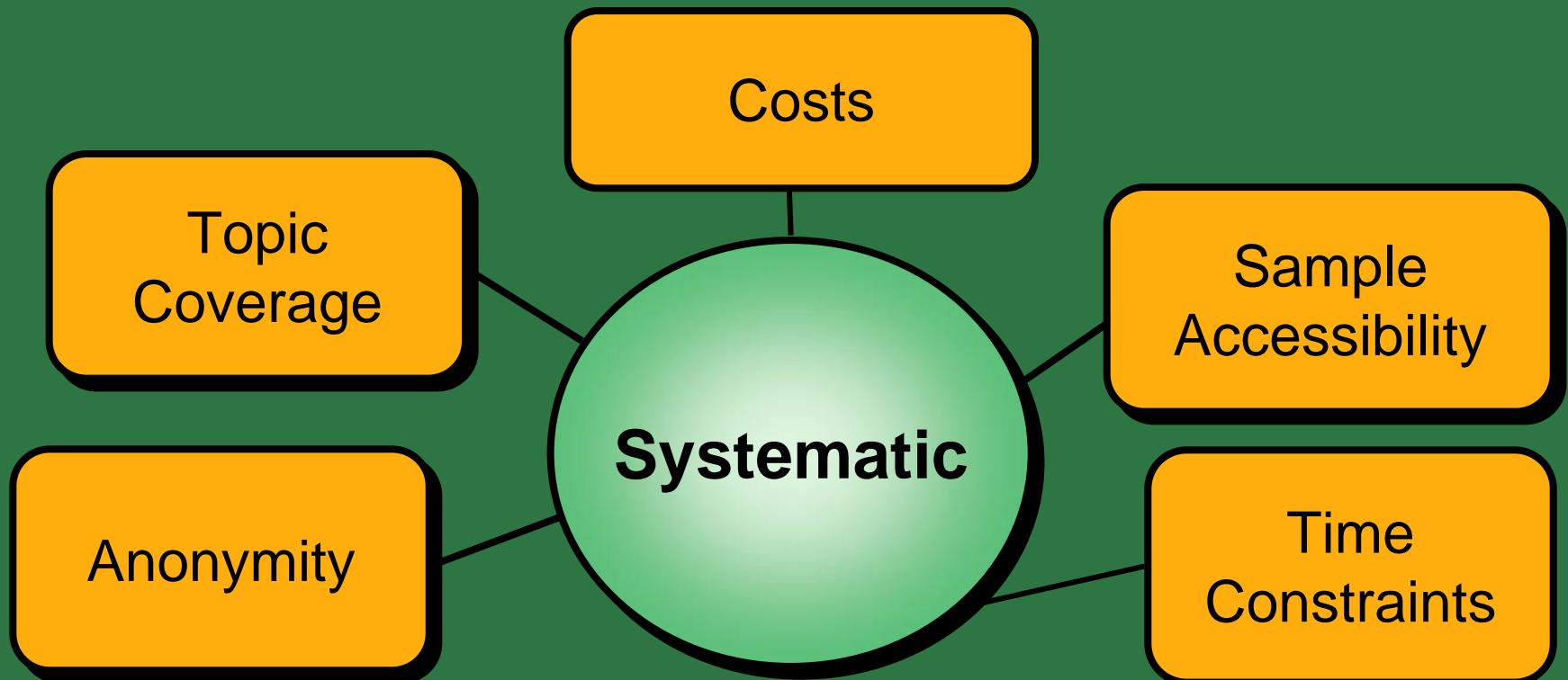
**Telephone
Survey**

**Survey via
Personal
Interview**

Self-Administered Surveys



Self-Administered Surveys



Designing Questionnaires Using the TDM

Easy to read

Offer clear directions

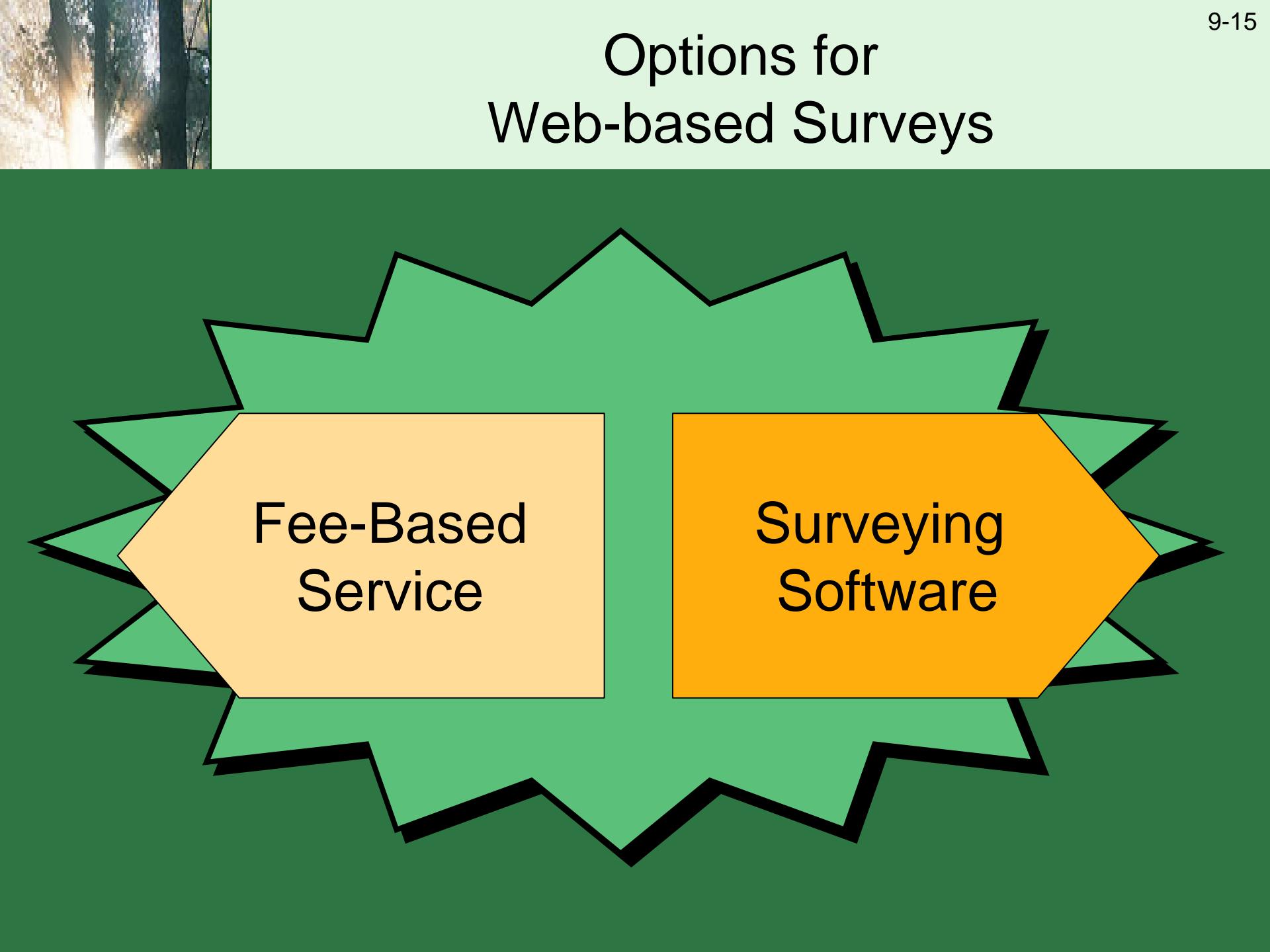
Include personalization

Notify in advance

Encourage response



Options for Web-based Surveys



Fee-Based
Service

Surveying
Software

Advantages of Surveying Software

- Questionnaire design in word processing environment
- Question and scale libraries
- Automated publishing to the Web
- Real-time viewing of incoming data
- Rapid transmission of results
- Flexible analysis and reporting mechanisms

The Web as a Survey Research Venue

Advantages

- Cost savings
- Short turnaround
- Use of visual stimuli
- Access to participants
- Perception of anonymity
- Access to data and experiences otherwise unavailable

Disadvantages

- Recruitment
- Coverage
- Difficulty developing probability samples
- Technical skill
- System compatibility issues
- Possible self-selection bias

Advantages of Self-Administered Study

- Access inaccessible participants
- Incentives for higher response rates
- Lowest-cost
- Geographic coverage
- Minimal staff needed
- Perceived anonymity
- Reflection time
- Question complexity

- Rapid data collection
- Visuals possible
- Multiple sampling possible



Disadvantages of Self-Administered Study

- Low response rates in some modes
- No interviewer intervention
- Cannot be too long
- Cannot be too complex
- Requires accurate list
- Skewed responses by extremists
- Participant anxiety possible
- Directions necessary
- Need for low-distraction environment
- Security



Improving Response Rates

- Advance notification
- Reminders
- Return directions and devices
- Monetary incentives
- Deadlines
- Promise of anonymity
- Appeal for participation

Telephone Survey



Advantages of the Telephone Survey



- Lower costs than personal interview
- Wide geographic coverage
- Fewer interviewers
- Reduced interviewer bias
- Fast completion time
- Random Dialing
- CATI

Disadvantages of the Telephone Survey

- Lower response rate
- Early termination
- Higher costs if geographically dispersed sample
- Limited Interview length
- Inaccessible populations
- Limited complexity of scales

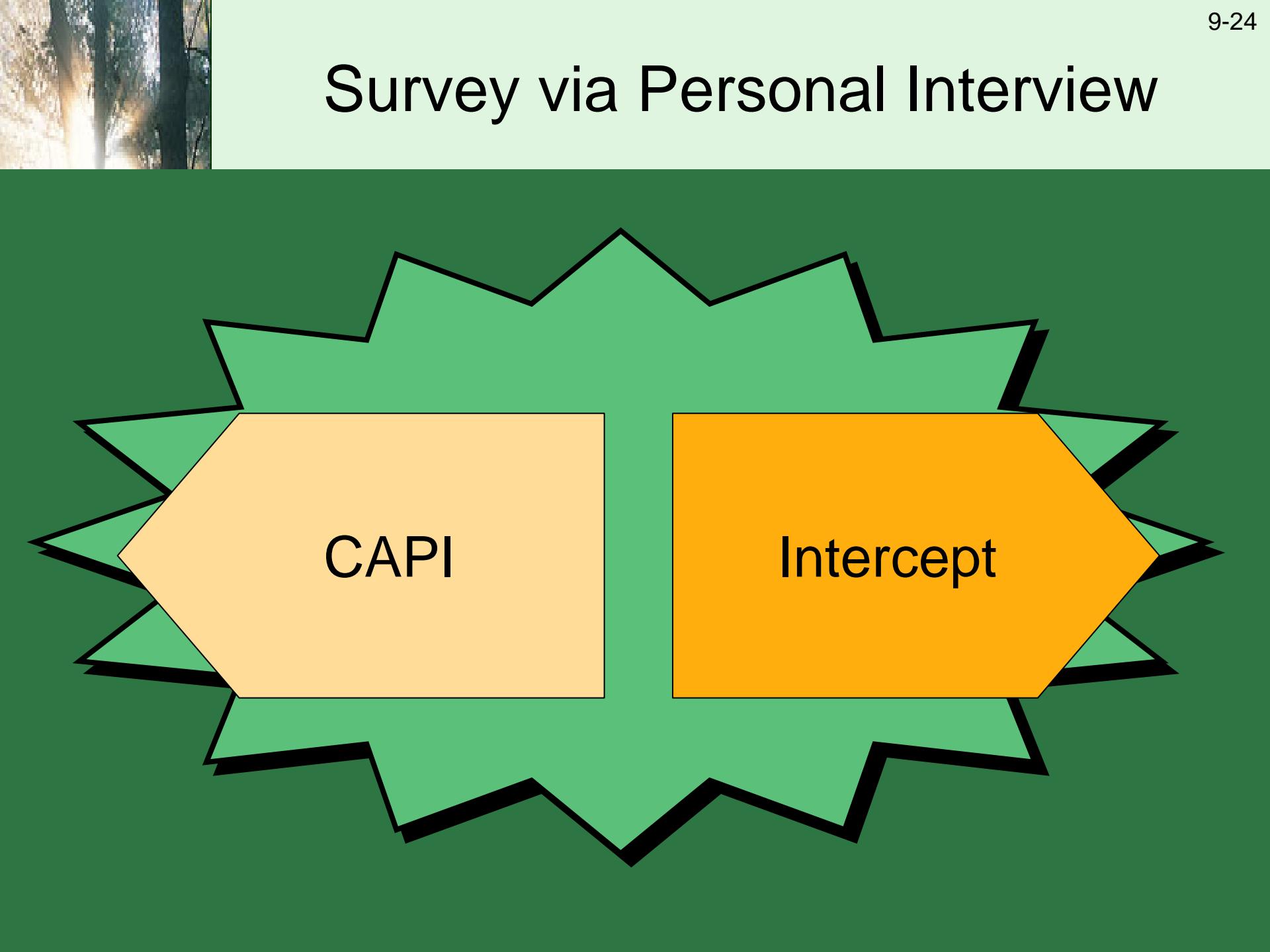
iPhone



Voice-over IP



Survey via Personal Interview



CAPI

Intercept

Personal Interview Survey

Advantages

- Good cooperation rates
- Interviewer can probe and explain
- Visual aids possible
- Illiterate participants can be reached
- Interviewer can prescreen
- CAPI possible

Disadvantages

- High costs
- Need for highly trained interviewers
- Time consuming
- Labor-intensive
- Some unwilling to invite strangers into homes
- Interviewer bias possible

Key Terms

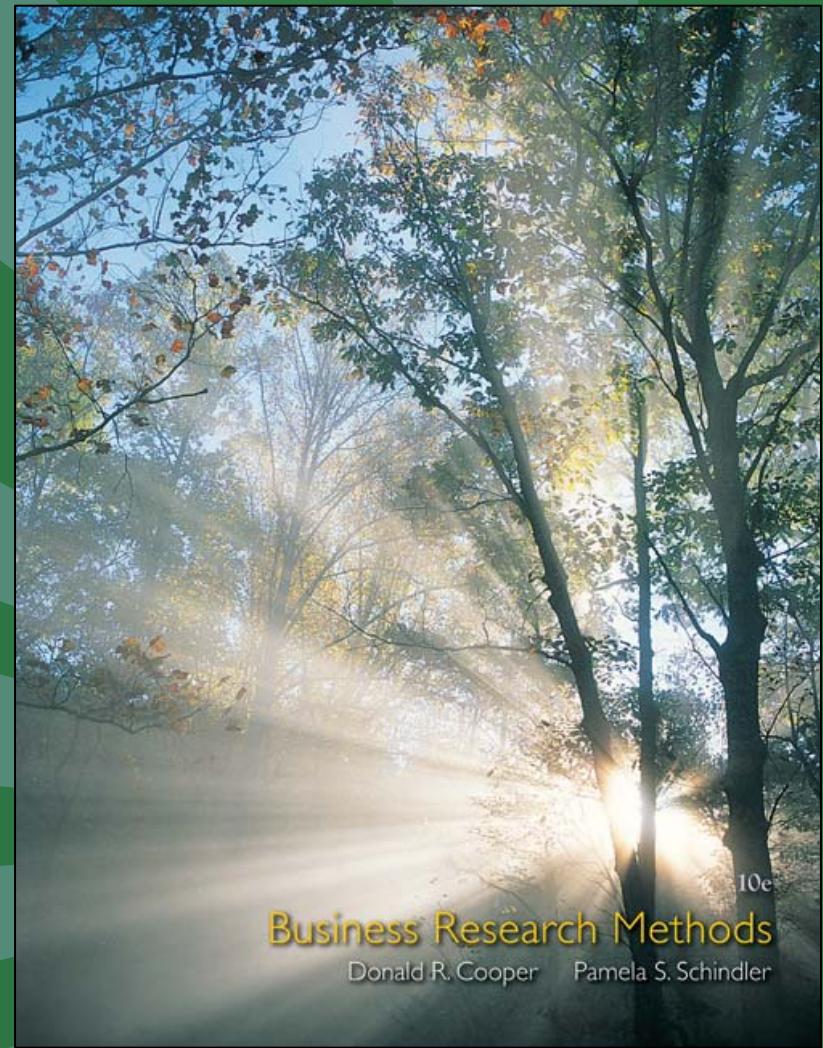
- Communication approach
- Computer-administered telephone survey
- Computer-assisted personal interviewing (CAPI)
- Computer-assisted self interview (CASI)
- Disk-by-mail survey
- Computer-assisted telephone interviewing (CATI)
- Intercept interview
- Interviewer error
- Mail survey
- Noncontact rate
- Nonresponse error

Key Terms (cont.)

- Panel
- Personal interview
- Random dialing
- Refusal rate
- Response error
- Self-administered survey
- Survey
- Telephone interview
- Web-based questionnaire

Chapter 10

Experiments





Learning Objectives

Understand . . .

- Uses for experimentation.
- Advantages and disadvantages of the experimental method.
- Seven steps of a well-planned experiment.
- Internal and external validity with experimental research designs.
- Three types of experimental designs and the variations of each.

PulsePoint: Research Revelation

826

The average dollar amount spent each year per employee on employee on training.



Experiments Challenge Perceptions

“We need to keep an open mind and approach life as a series of experiments. We need to observe the experiments happening around us and create new ones. Instead of accepting the world as we think it is, we need to keep testing it to find out what it is and what works.”

*Jerry Wind , Wharton School of Business,
University of Pennsylvania*

Causal Evidence



**Agreement between
IVs and DVs**

Time order of occurrence

**Extraneous variables
did not influence DVs**

Causal Evidence



Research shows they drink 22 cases of beer each summer.

Now let's talk about software support. If the software hiccups or takes an unscheduled break, the wrong questions can get answered. Only nonstop support can keep that from happening.

That's why the world's top research organizations rely on CfMC - the only nonstop in the business.

CfMC
Research Software

Nonstop Support

www.cfmc.com

San Francisco 866 LUV CfMC | New York 212.777.5120 | London 0-20 7605-6627

Evaluation of Experiments

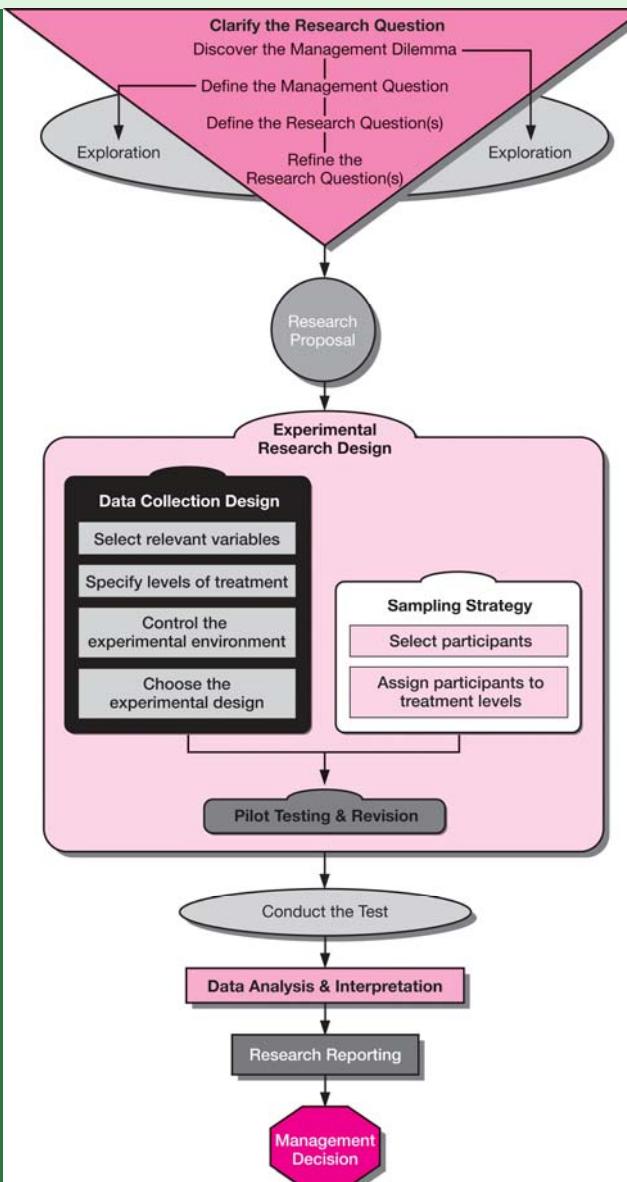
Advantages

- Ability to manipulate IV
- Use of control group
- Control of extraneous variables
- Replication possible
- Field experiments possible

Disadvantages

- Artificiality of labs
- Non-representative sample
- Expense
- Focus on present and immediate future
- Ethical limitations

Experimentation in the Research Process



Conducting an Experiment

Specify treatment variables

Specify treatment levels

Control environment

Choose experimental design

Select and assign participants

Pilot-test, revise, and test

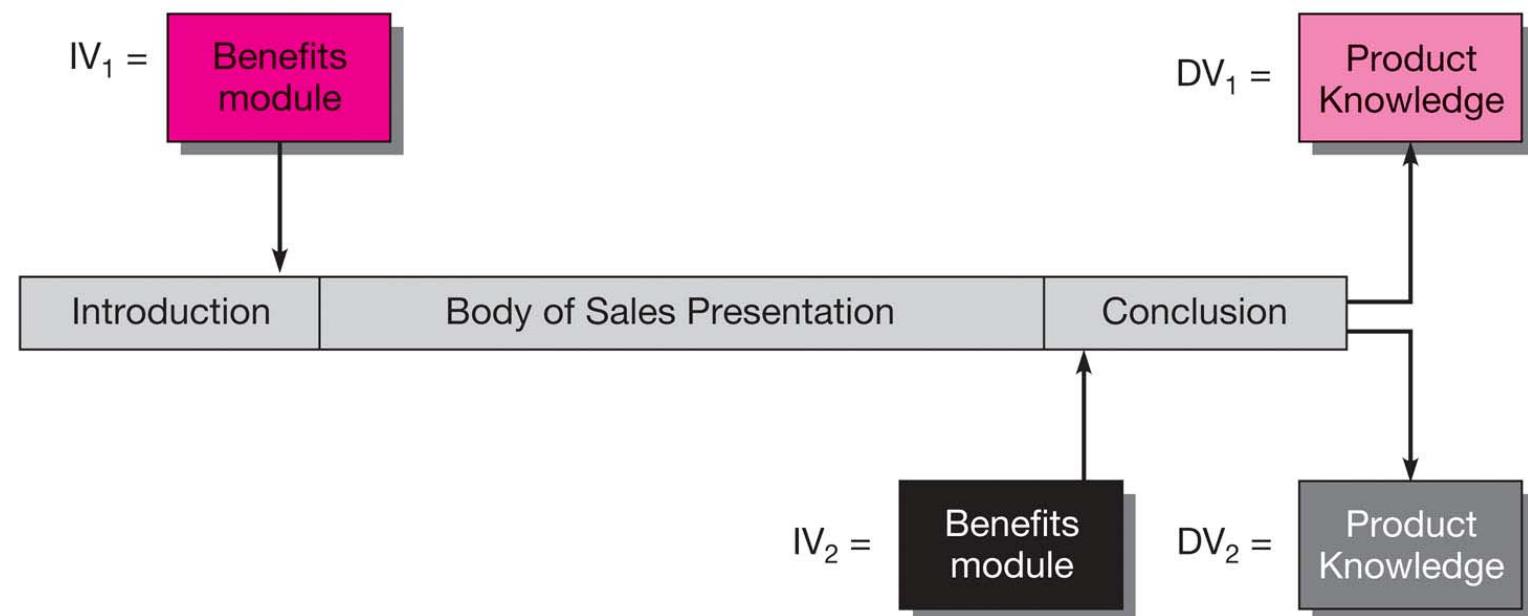
Collect data

Analyze data

Experiment: Placement of Benefits Module

Hypothesis: Sales presentations in which the benefits module is placed in the introduction of a 12-minute message produce better retention of product knowledge by the customer than those in which the benefits module is placed in the conclusion.

$$\text{Effect} = \mathbf{DV}_1 - \mathbf{DV}_2$$



Selecting and Assigning Participants

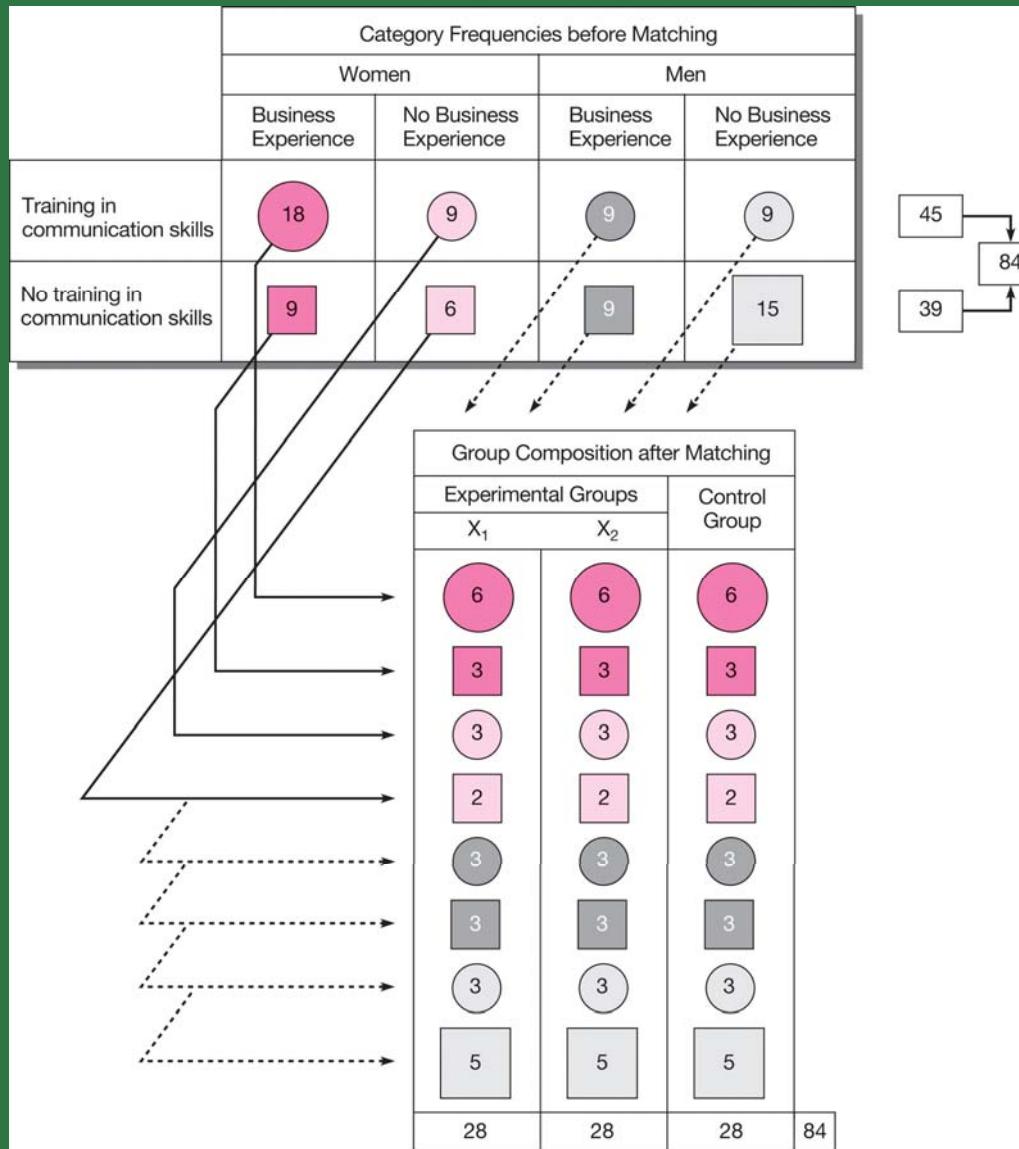
Random
assignment

Matching

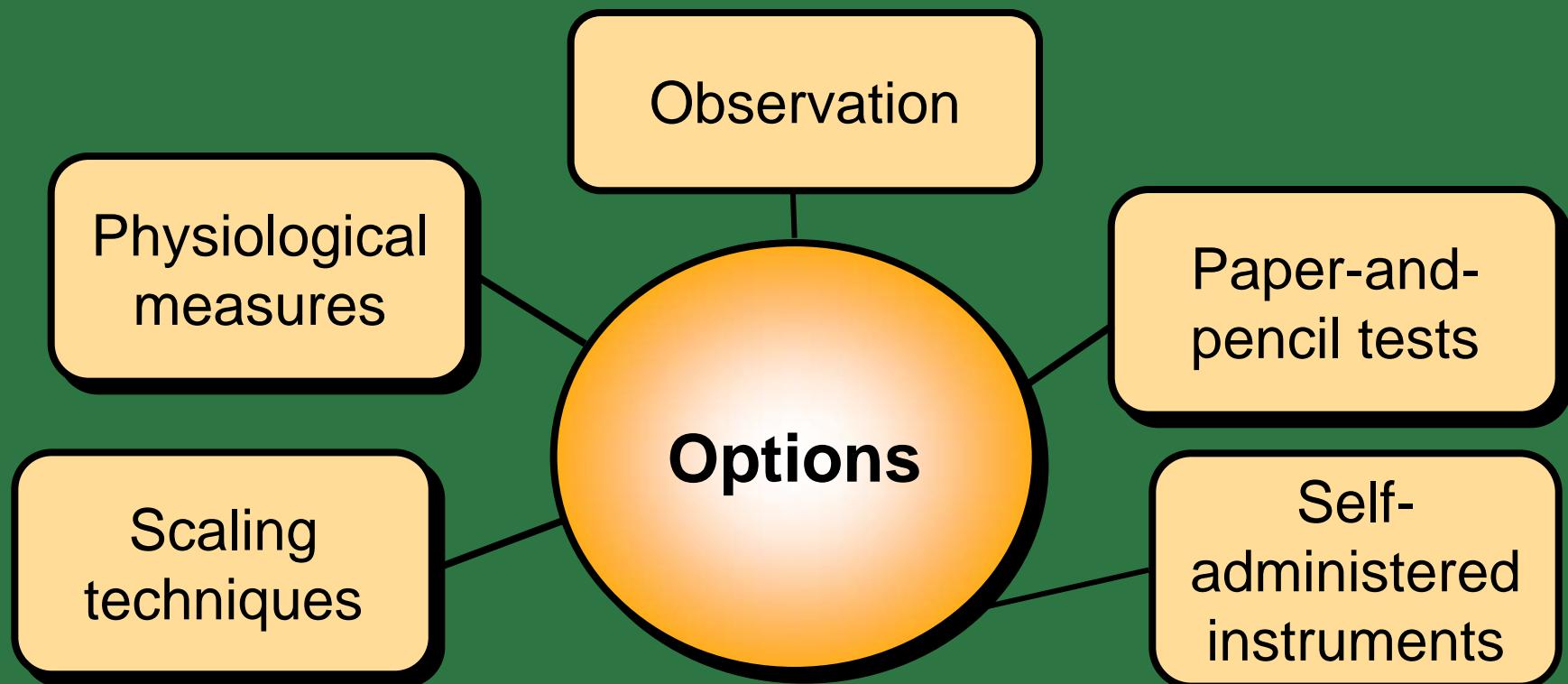
Random Assignment



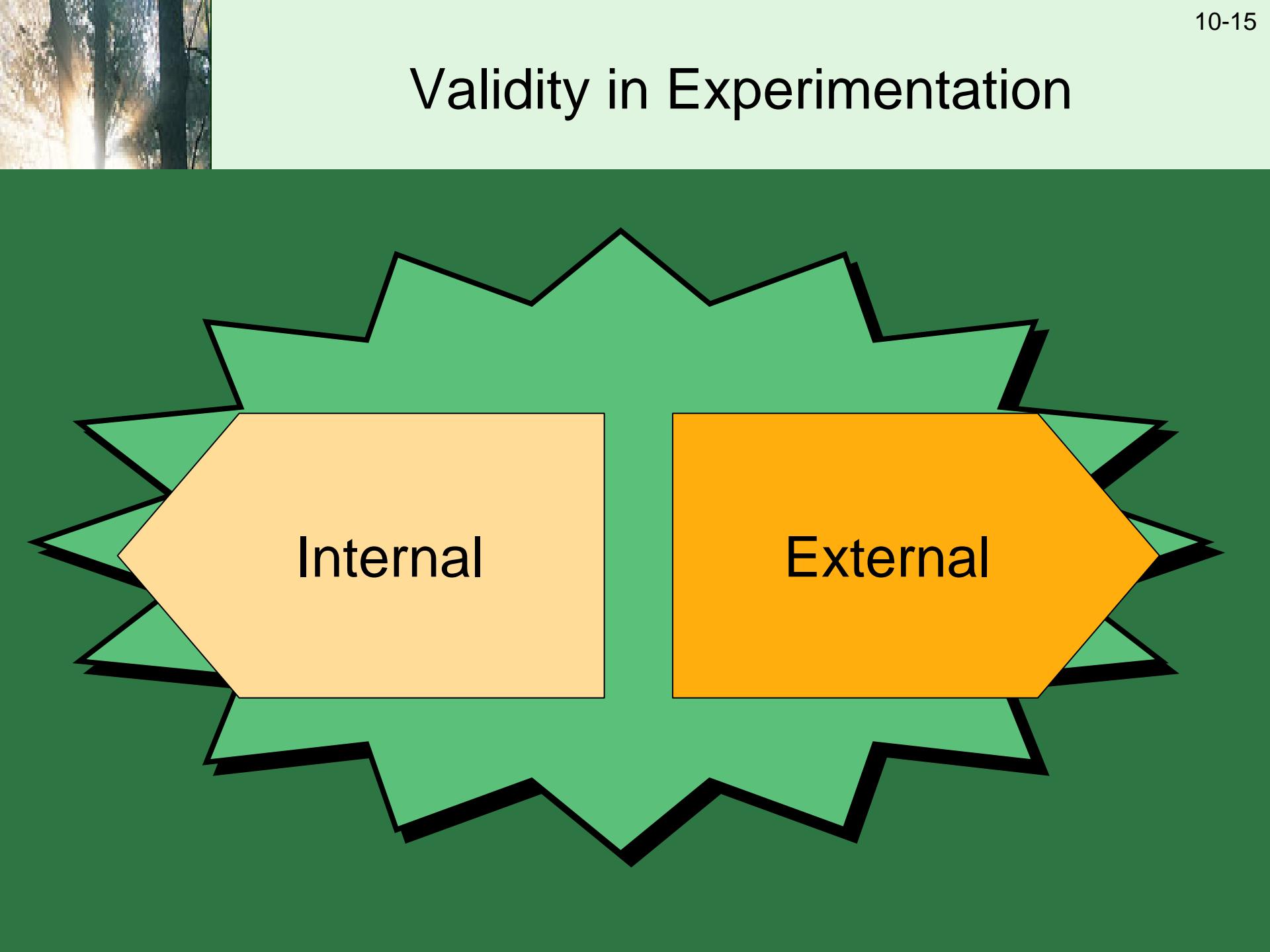
Quota Matrix Example



Measurement Options



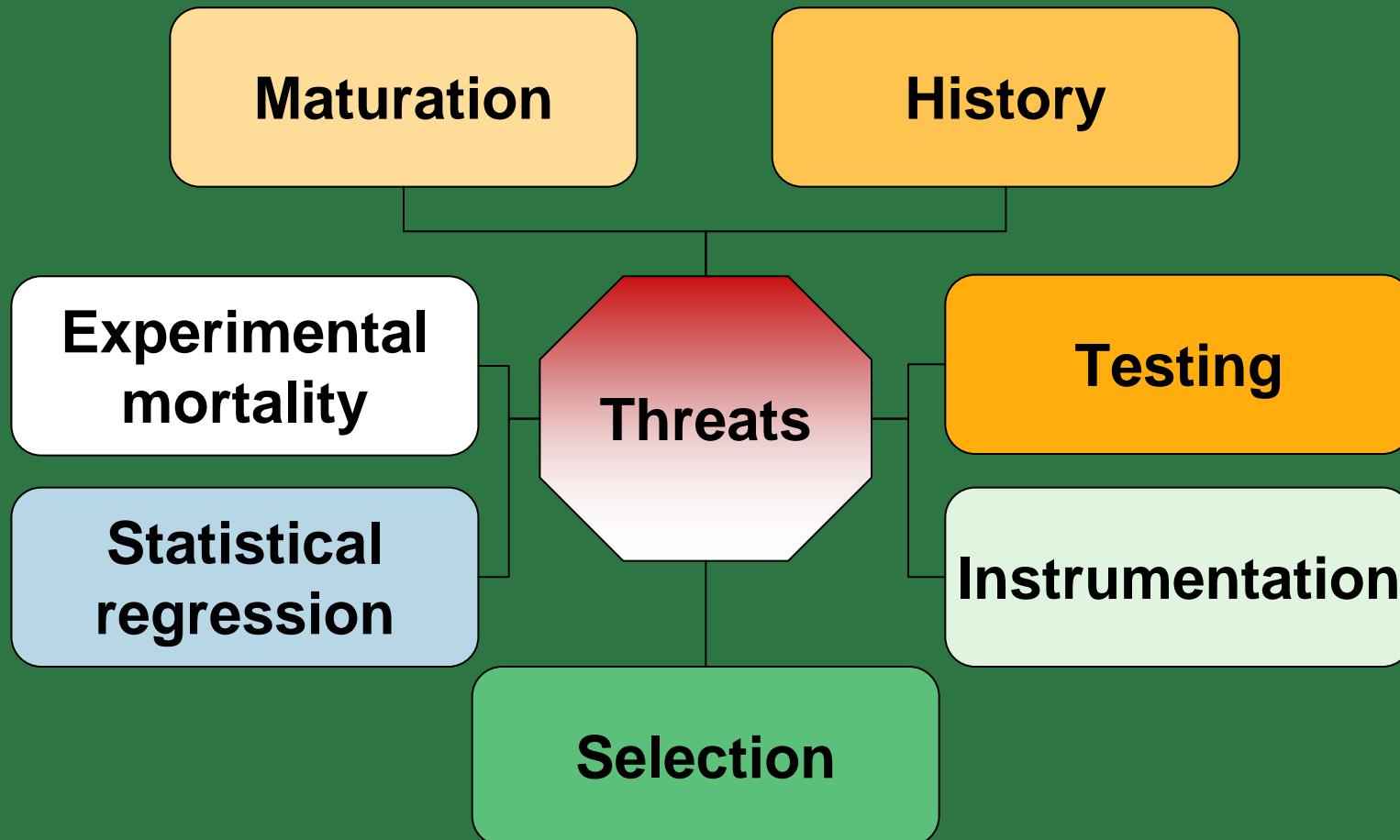
Validity in Experimentation



Internal

External

Threats to Internal Validity



Additional Threats to Internal Validity

Diffusion of treatment

Compensatory equalization

Compensatory rivalry

Resentful disadvantaged

Local history

Threats to External Validity

The merchandise was organized in a way that made it easy to find what I was looking for.

Does Not
Describe At All

Definitely
Describes

(1) (2) (3) (4) (5)

Reactivity of
testing on X

Interaction of
selection and X

Other
reactive factors

Next Question

Experimental Research Designs

Pre-experiments

True experiments

Field experiments

After-Only Case Study

X O



Pre-experiment

One Group Pretest-Posttest Design



Static Group Comparison

X

O₁

.....

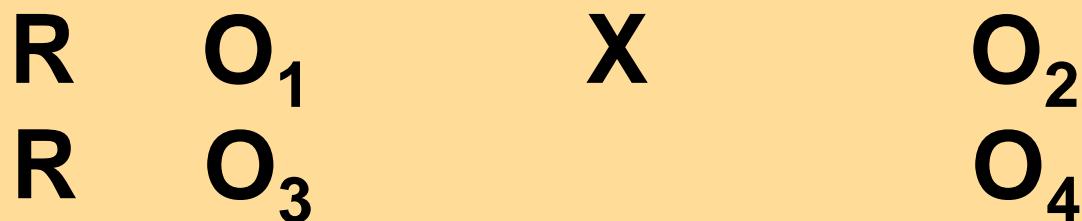
.....

O₂



Pre-experiment

Pretest-Posttest Control Group Design



True experiment

Posttest-Only Control Group Design

R X O₁
R O₂



Nonequivalent Control Group Design

O_1
 O_3 \times O_2
 O_4



Separate Sample Pretest-Posttest Design

R O₁ (X)
R X O₂

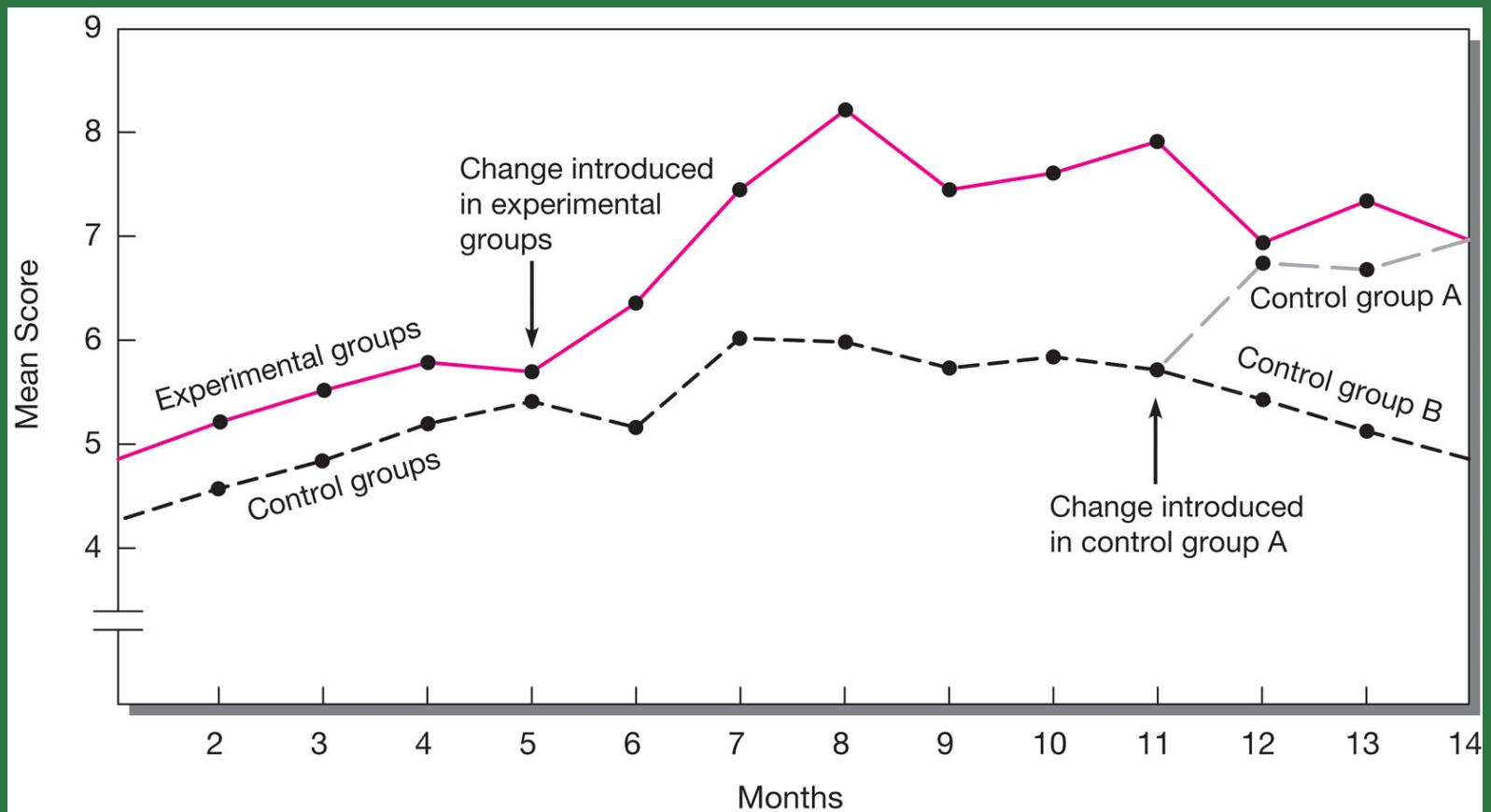


Group Time Series Design

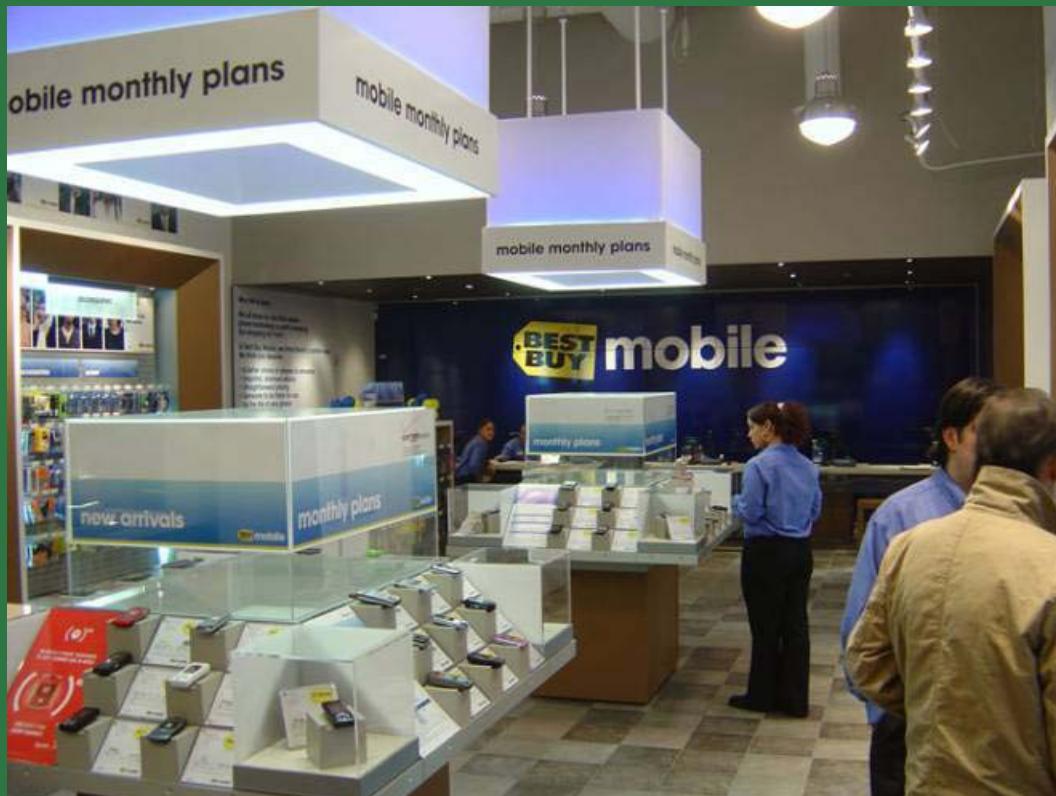
R	O ₁	O ₂	O ₃	X	O ₄	O ₅	O ₆
R	O ₇	O ₈	O ₉		O ₁₀	O ₁₁	O ₁₂



Job Enrichment Quasi-Experiment



Experiment: Finding the Store Design



Experiment: The Right Size of Flavor



Key Terms

- Blind
- Control group
- Controlled test market
- Dependent variable
- Double-blind
- Environmental control
- Experiment
- Experimental treatment
- External validity
- Field experiment
- Hypothesis
- Independent variable
- Internal validity

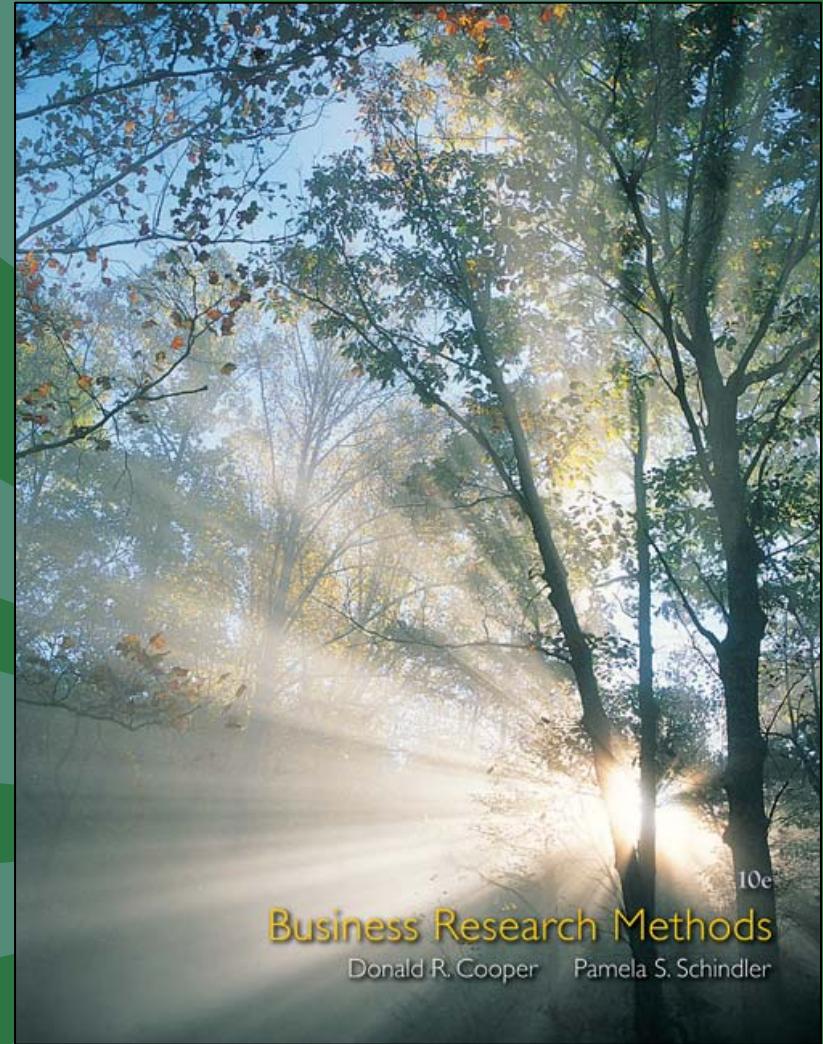
Key Terms

- Matching
- Operationalized
- Quota matrix
- Random assignment
- Replication

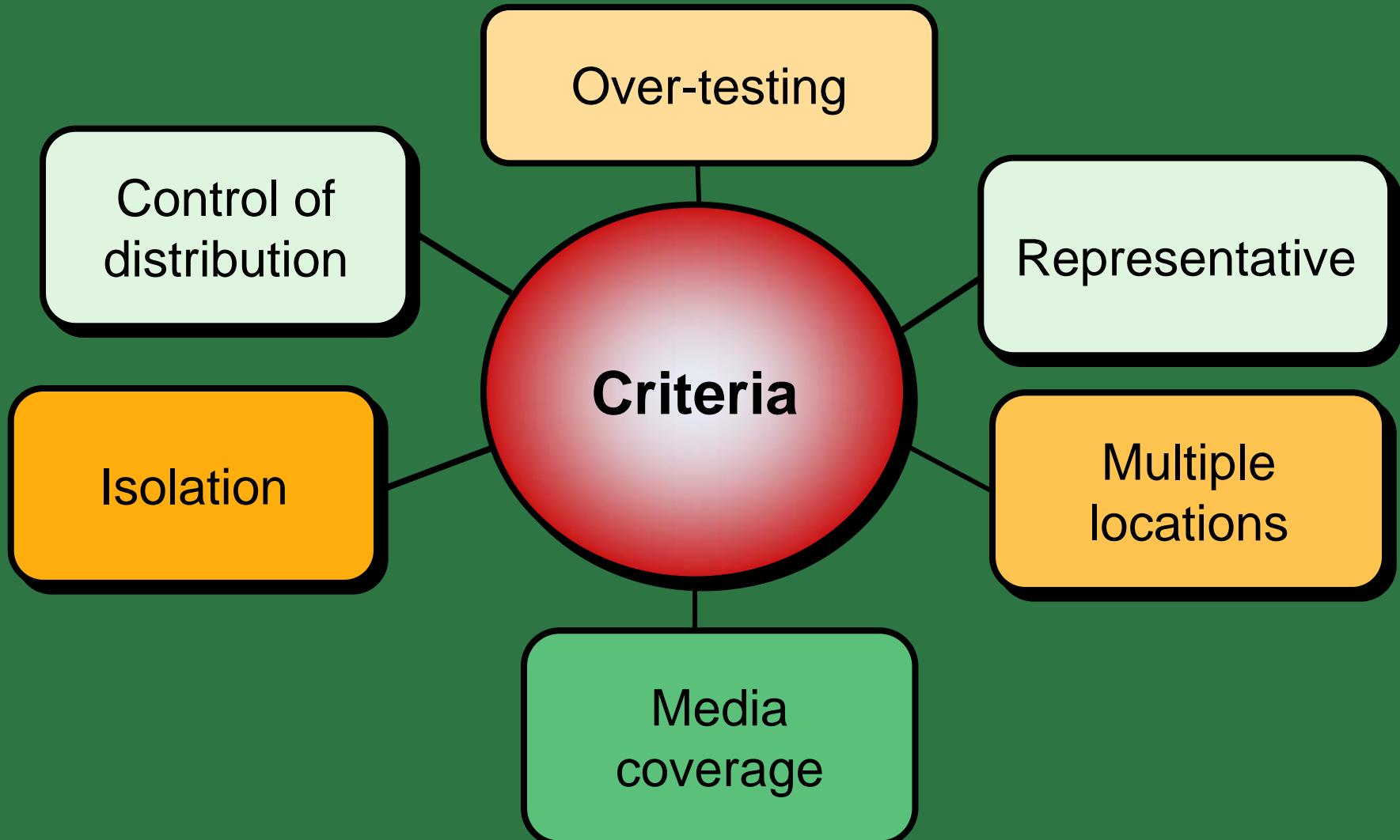
- Test market
 - Electronic test market
 - Simulated test market
 - Standard test market
 - Virtual test market
- Treatment levels
- Web-enabled test market

Appendix 10b

Test Markets



Test Market Selection



Types of Test Markets

Standard

Controlled

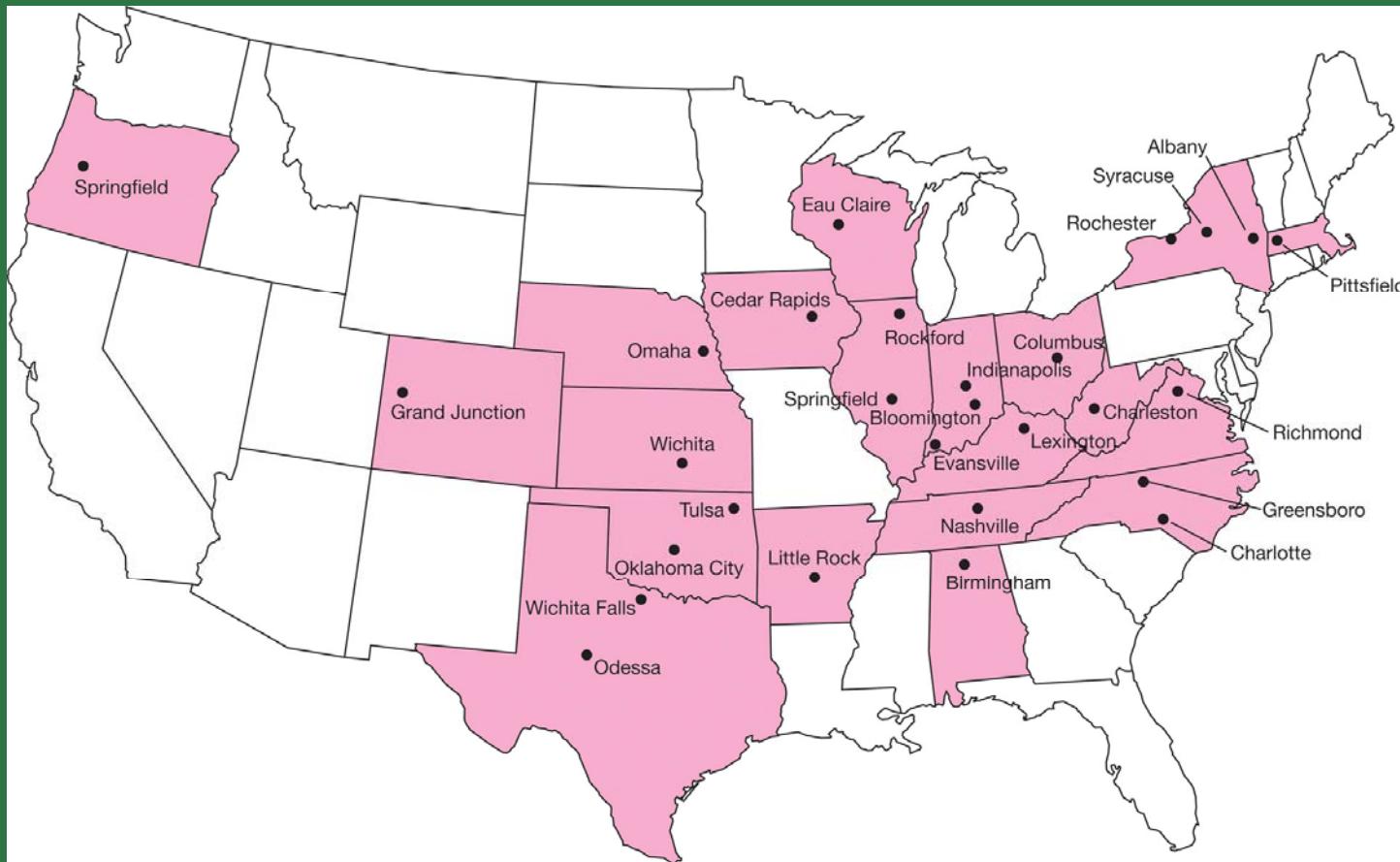
Electronic

Simulated

Virtual

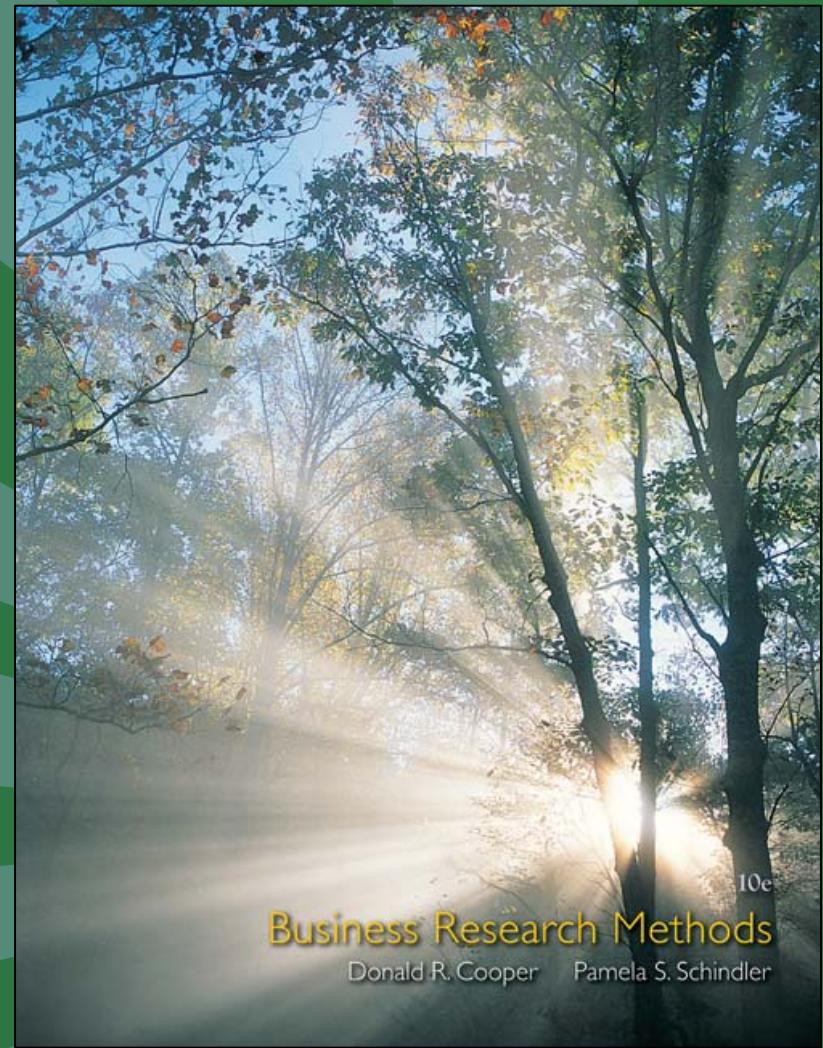
Web-enabled

Test Market Cities



Chapter 11

Measurement





Learning Objectives

Understand . . .

- The distinction between measuring objects, properties, and indicants of properties.
- The similarities and differences between the four scale types used in measurement and when each is used.
- The four major sources of measurement error.
- The criteria for evaluating good measurement.

PulsePoint: Research Revelation

32.5

The percent of U.S. manufacturers experiencing unfair currency manipulation in the trade practices of other countries.

Why Measurement Is Important

“If you can’t measure it, you can’t manage it.”

*Bob Donath,
Bob Donath and Co, Inc*

Measurement

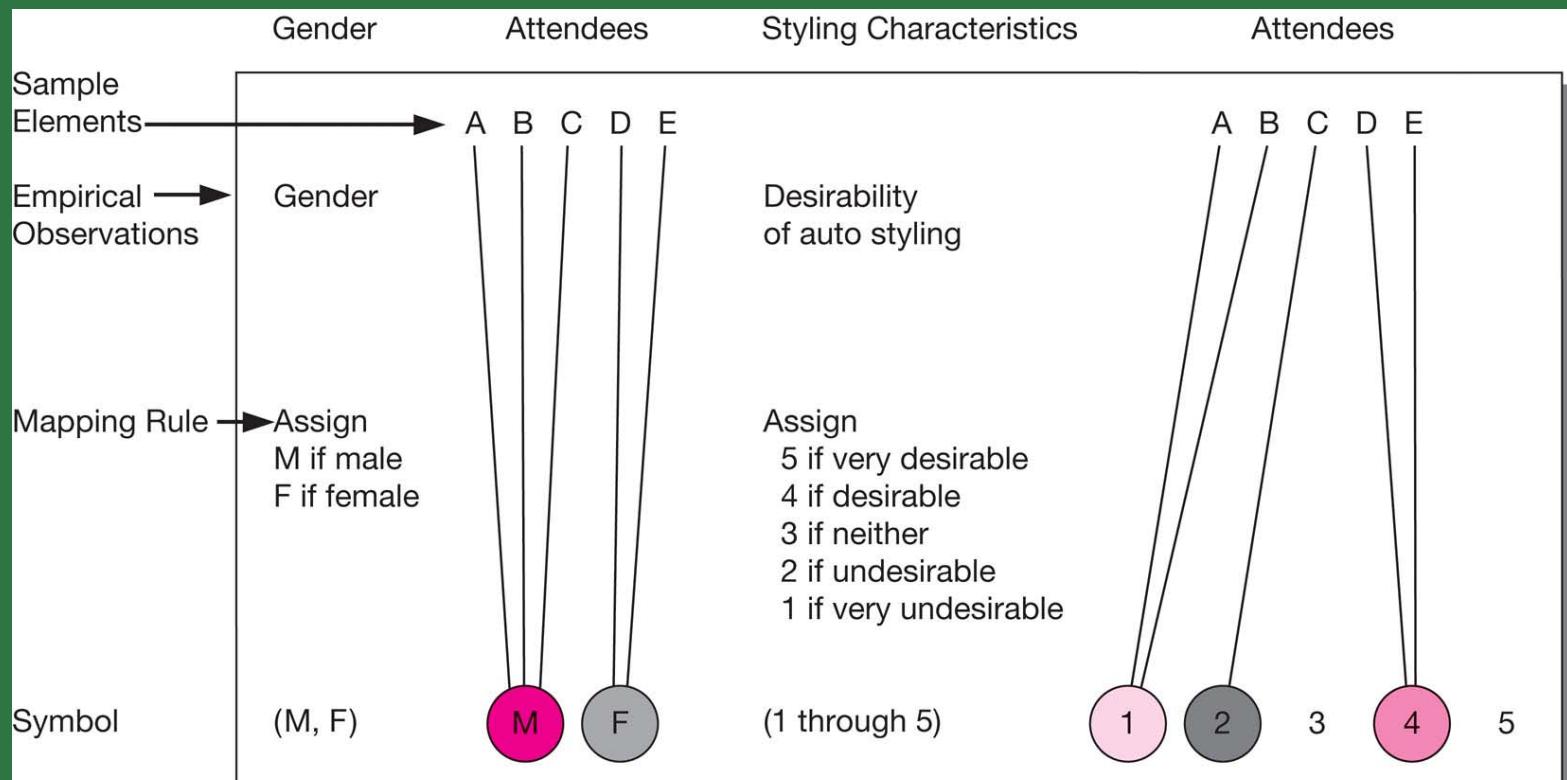
Selecting
measurable phenomena

Developing a set of
mapping rules

Applying the mapping rule
to each phenomenon



Characteristics of Measurement



Attendees A, B, and C are male, and find the auto's styling to be undesirable.
 Attendees D and E are female and find the auto's styling desirable.

Levels of Measurement

Nominal

Classification

Ordinal

interval

Ratio

Types of Scales

Nominal

Ordinal

interval

Ratio

Nominal Scales

- **Mutually exclusive** and **collectively exhaustive** categories
- Exhibits the **classification** characteristic only



Levels of Measurement

Nominal

Classification

Ordinal

Classification

Order

interval

Ratio

Ordinal Scales



- Characteristics of nominal scale plus an indication of **order**
- Implies statement of greater than and less than

Levels of Measurement

Nominal

Classification

Ordinal

Classification

Order

interval

Classification

Distance

Order

Ratio

Interval Scales

- Characteristics of nominal and ordinal scales plus the concept of **equality of interval**.
- **Equal distance** exists between numbers



Levels of Measurement

Nominal

Classification

Ordinal

Classification

Order

interval

Classification

Distance

Order

Ratio

Classification

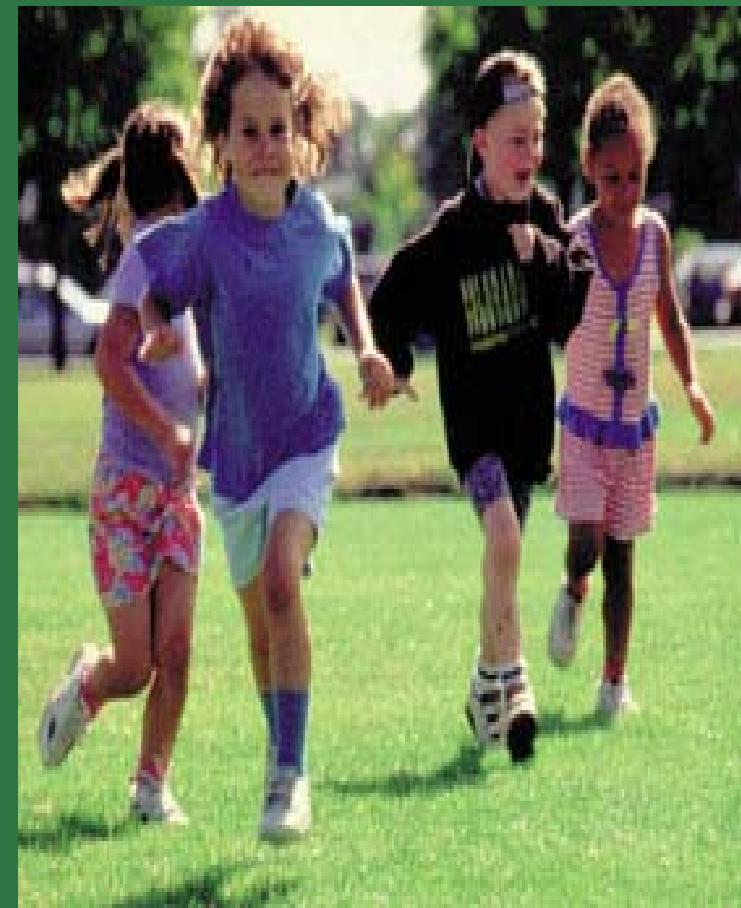
Distance

Order

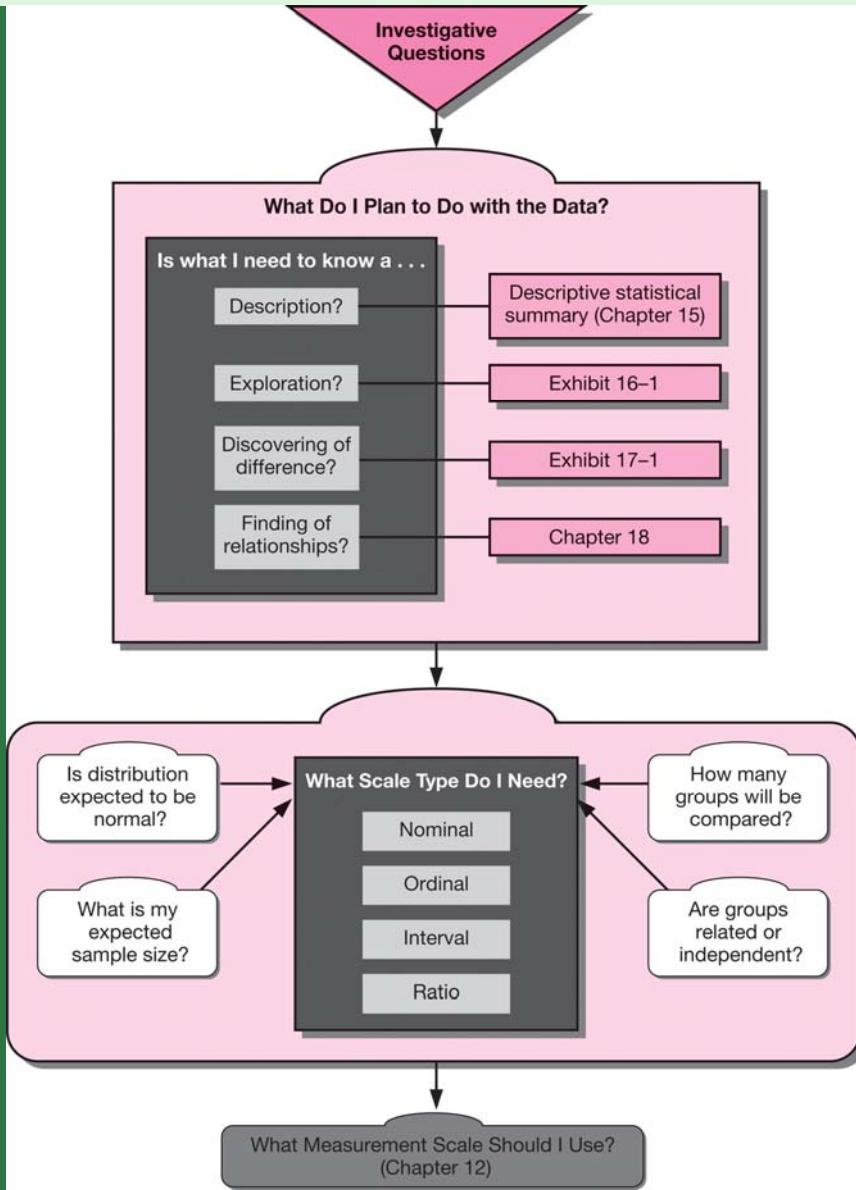
Natural Origin

Ratio Scales

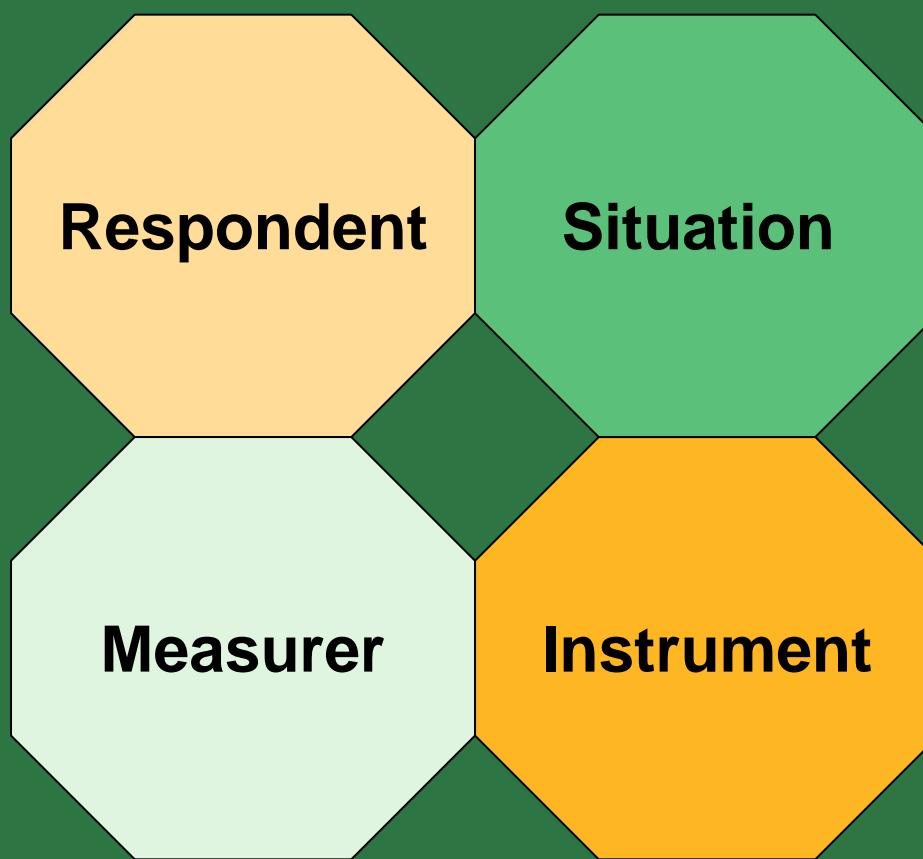
- Characteristics of previous scales plus an **absolute zero** point
- Examples
 - Weight
 - Height
 - Number of children



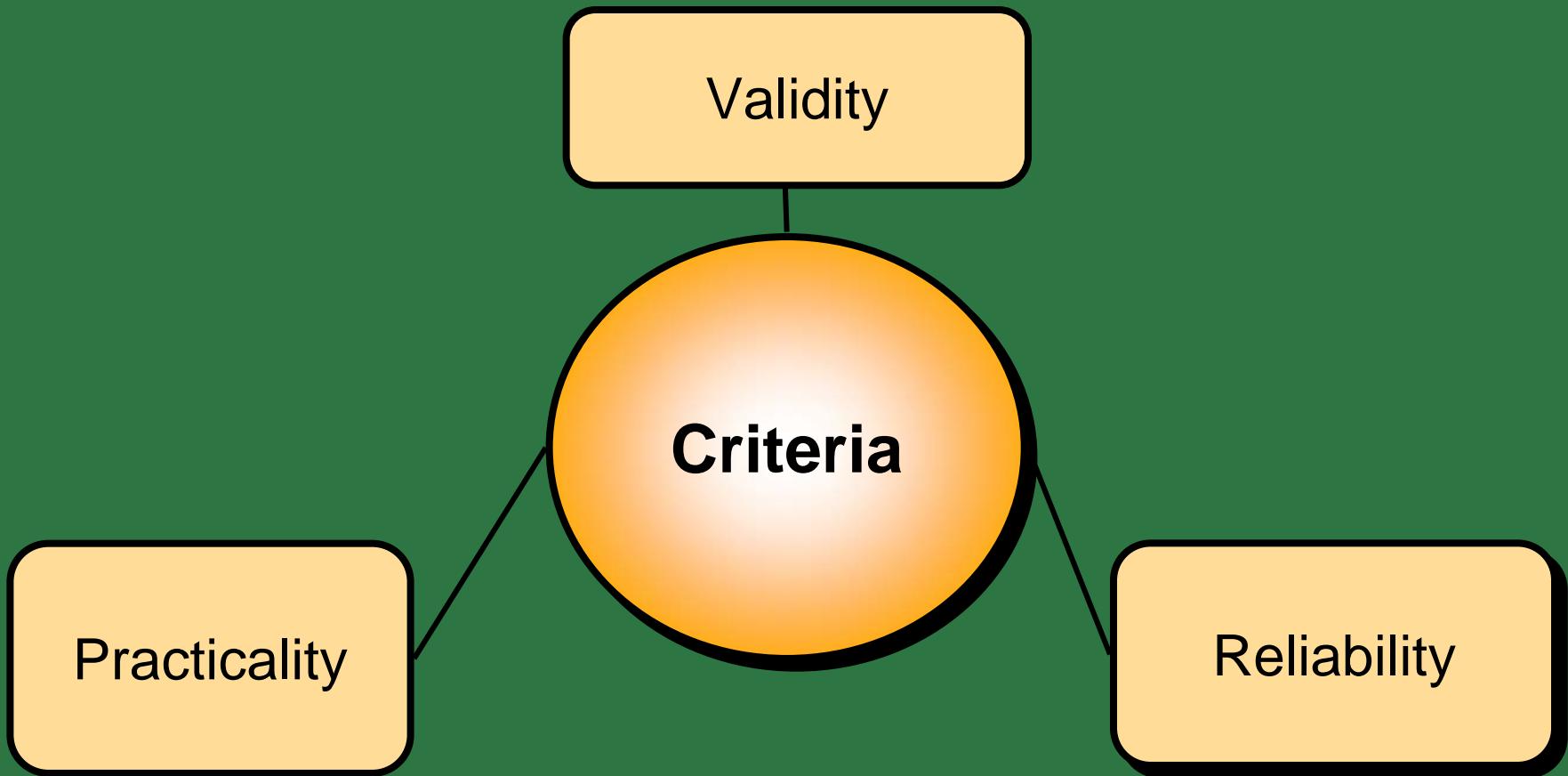
Moving from Investigative to Measurement Questions



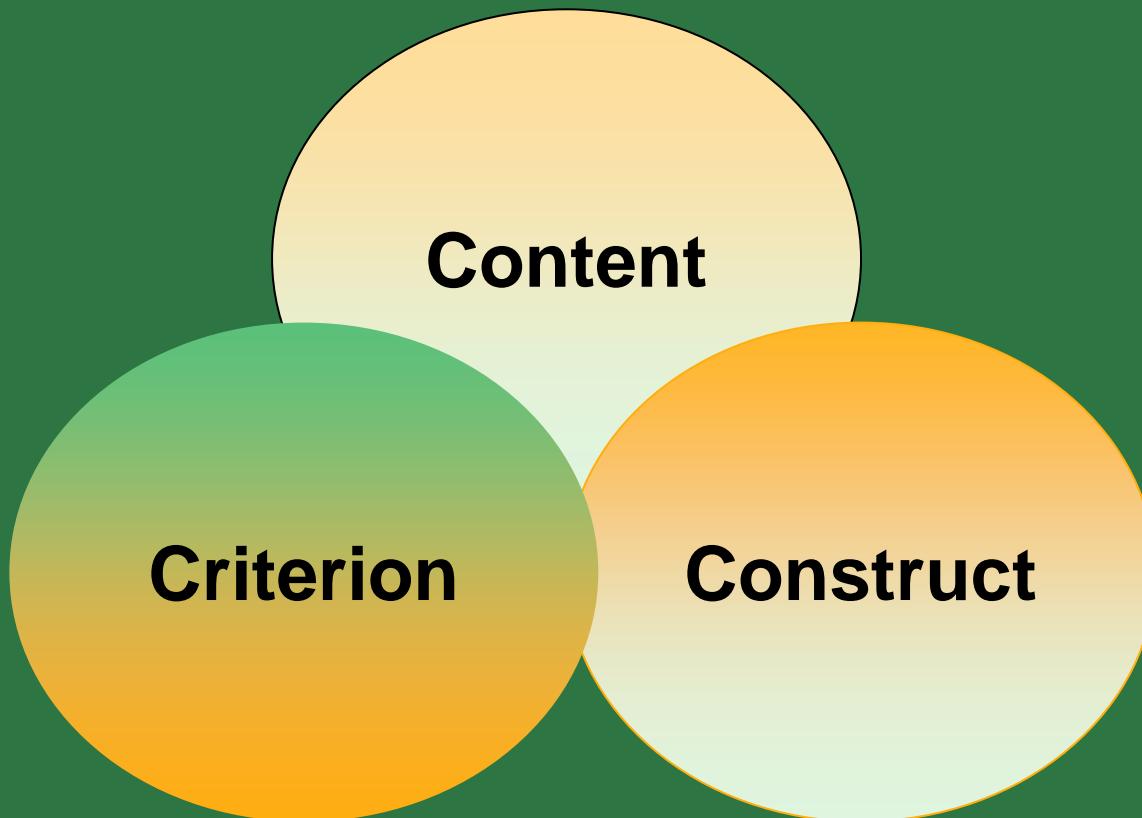
Sources of Error



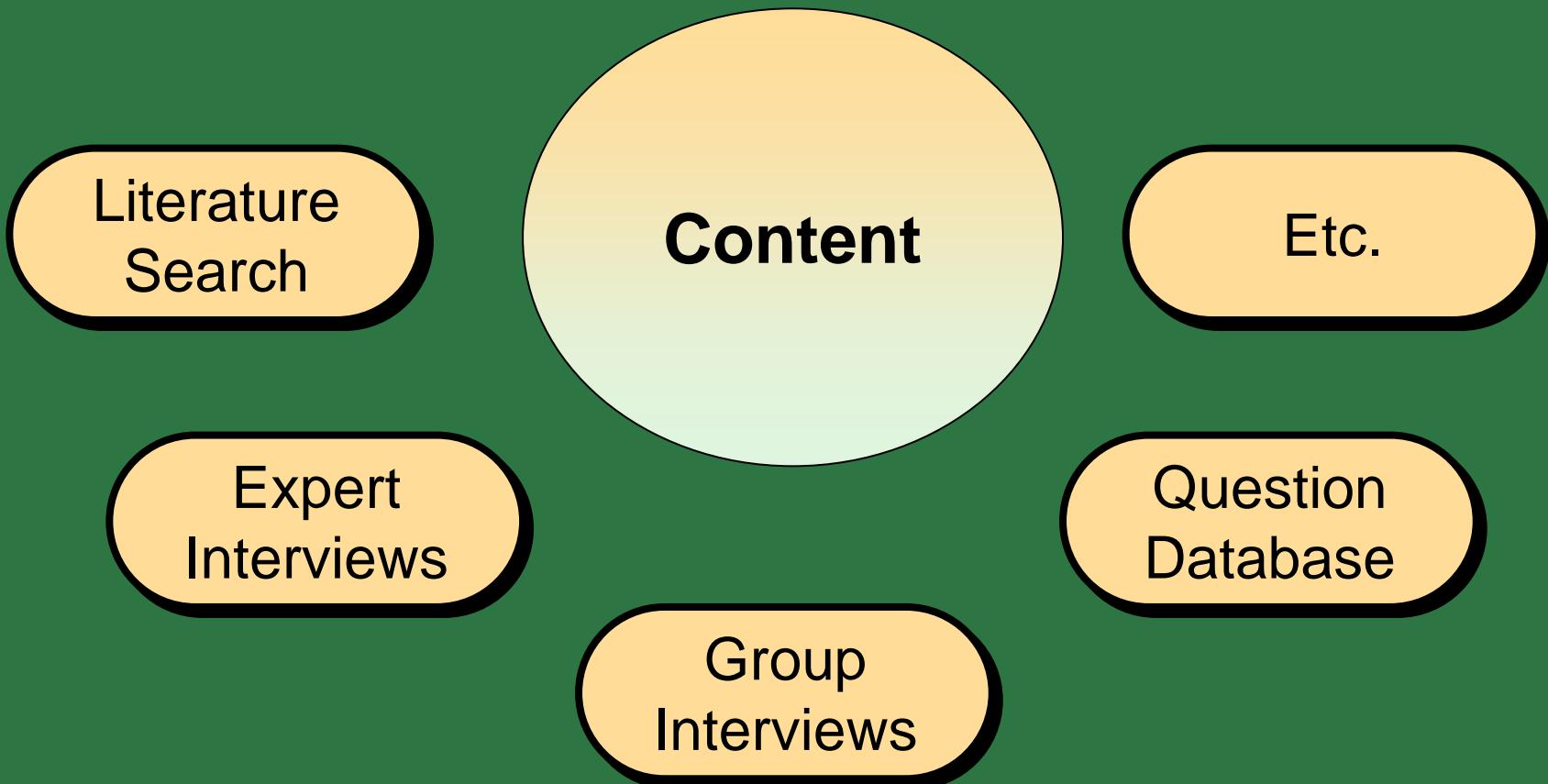
Evaluating Measurement Tools



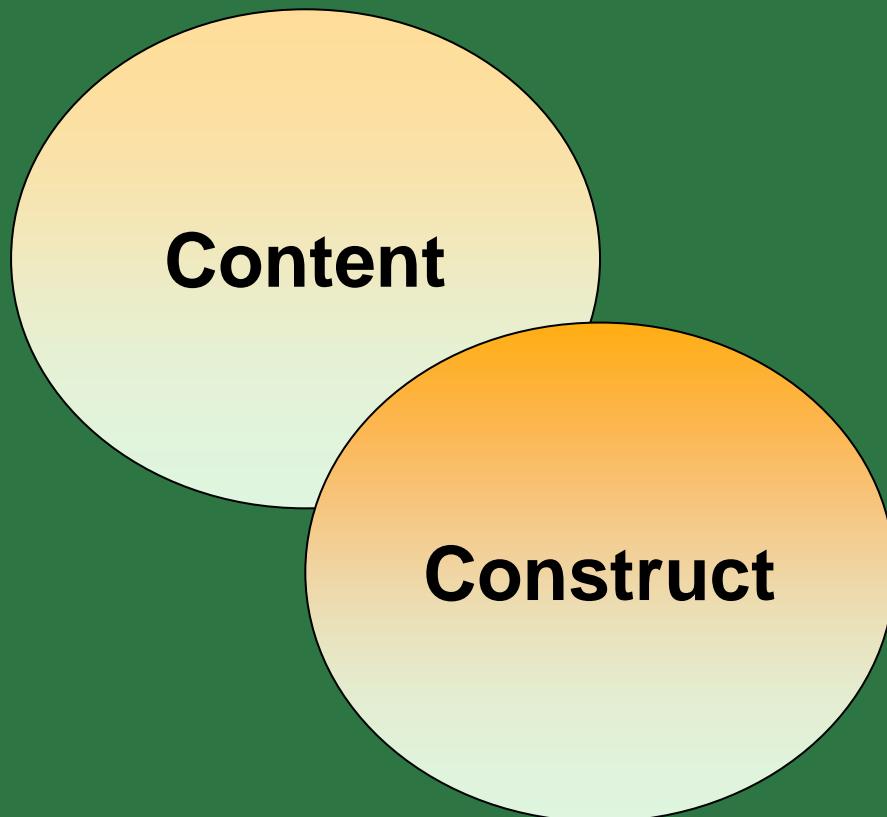
Validity Determinants



Increasing Content Validity



Validity Determinants



Increasing Construct Validity

New measure of trust

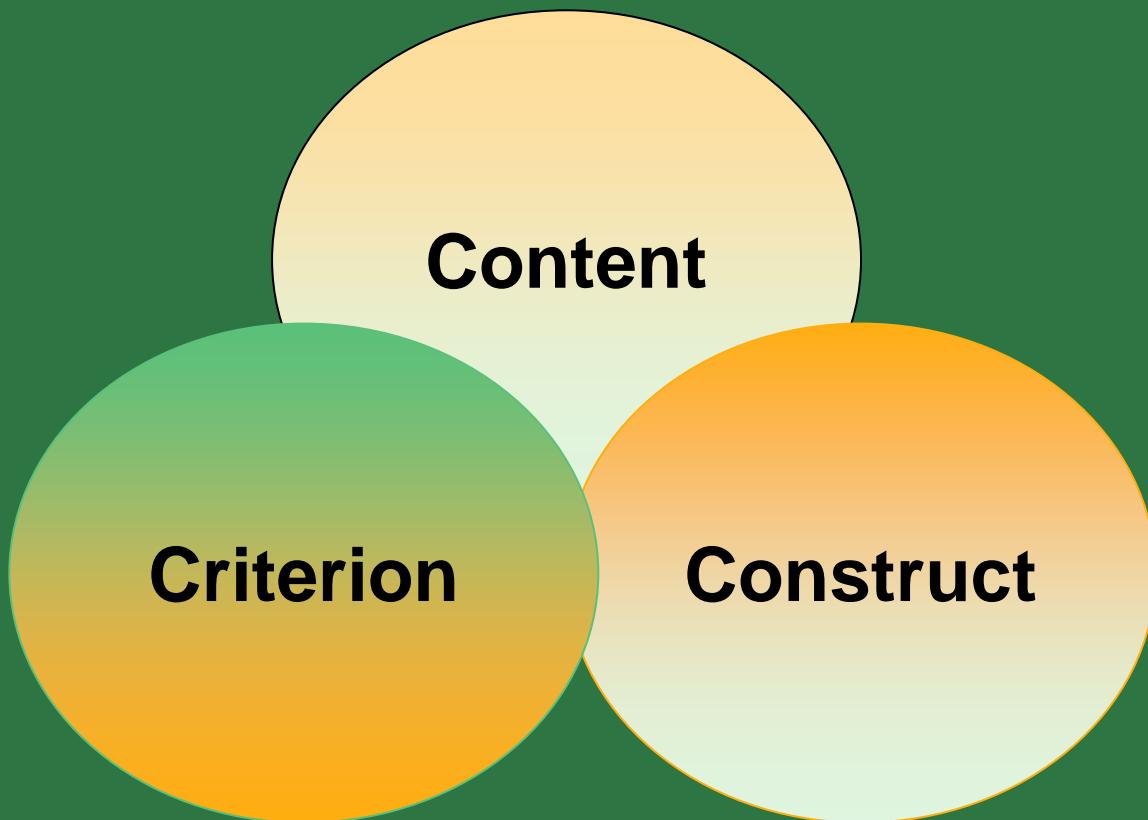
Known measure of trust

Empathy

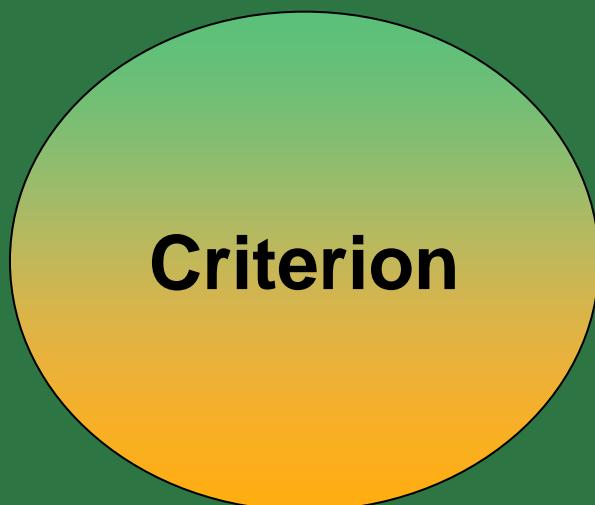
Credibility



Validity Determinants



Judging Criterion Validity



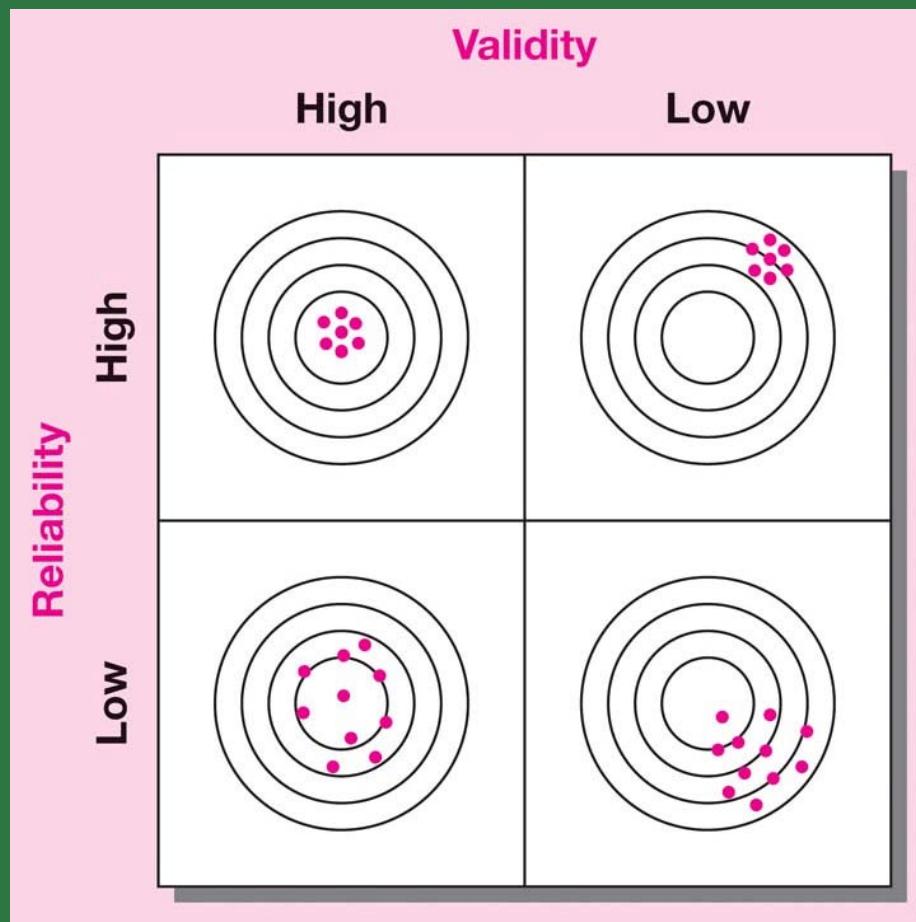
Relevance

Freedom from bias

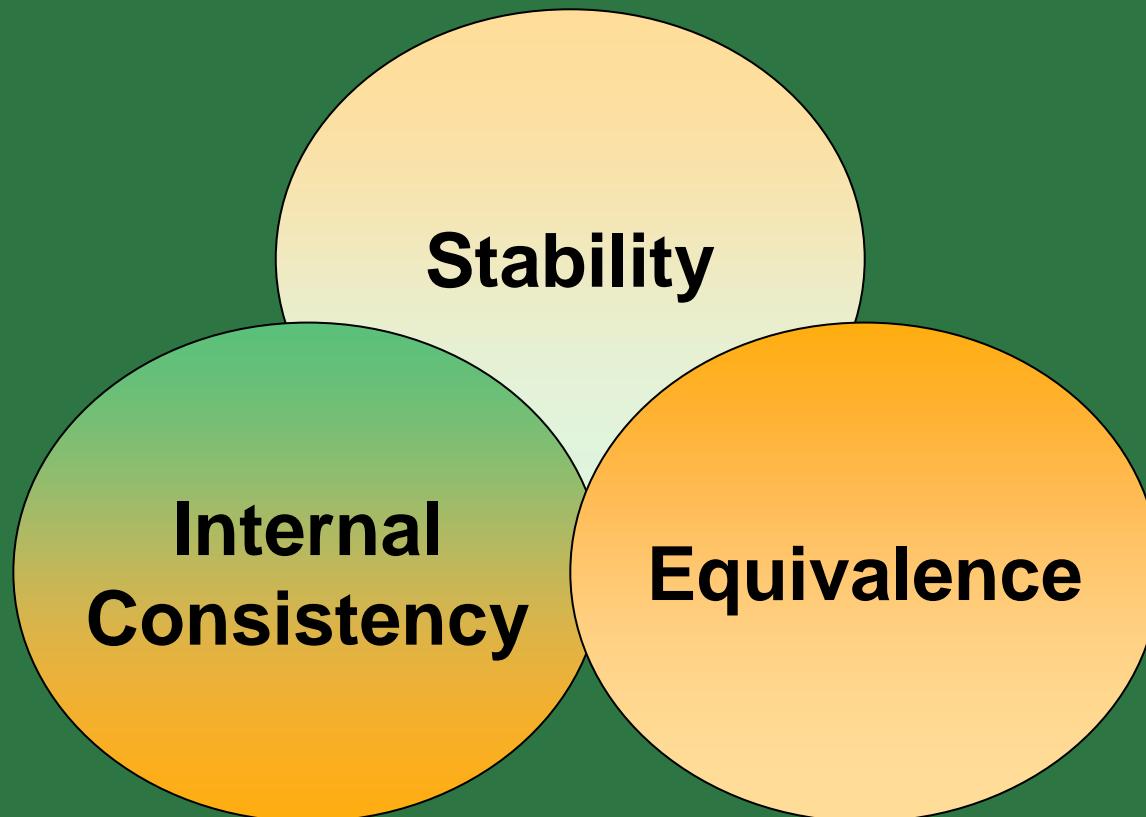
Reliability

Availability

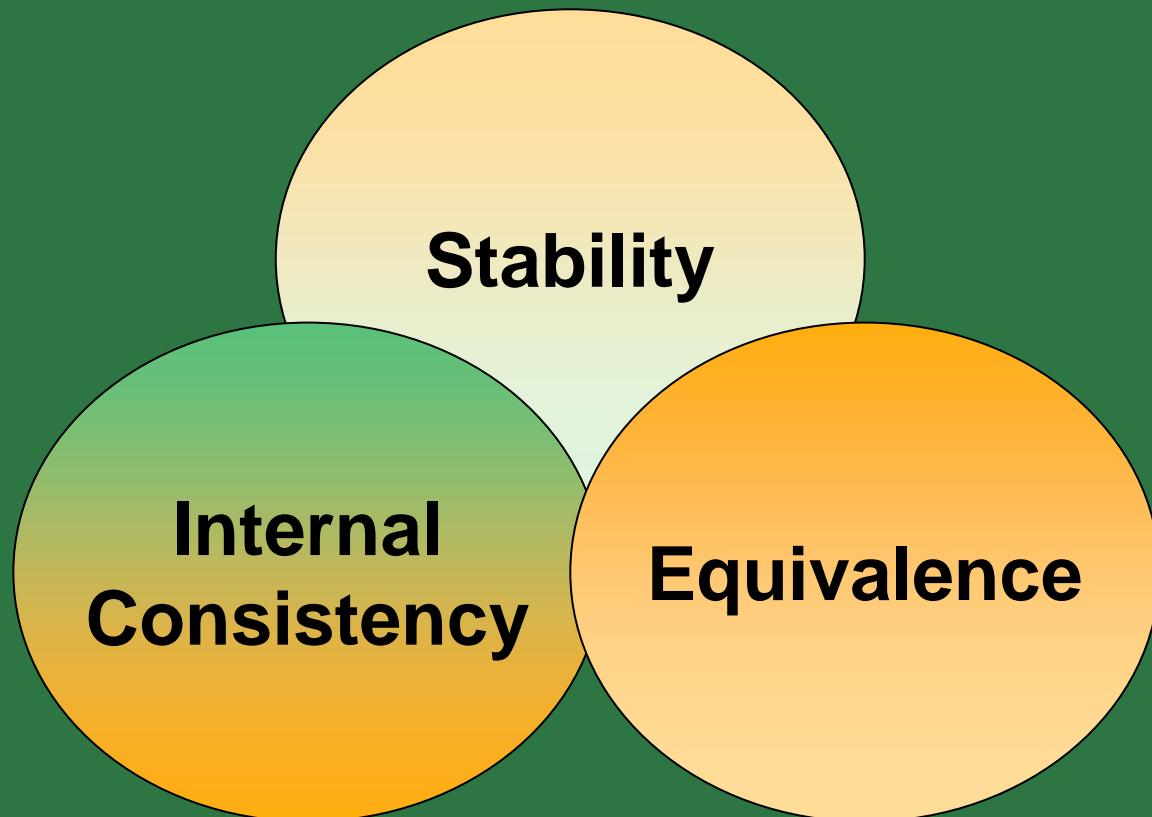
Understanding Validity and Reliability



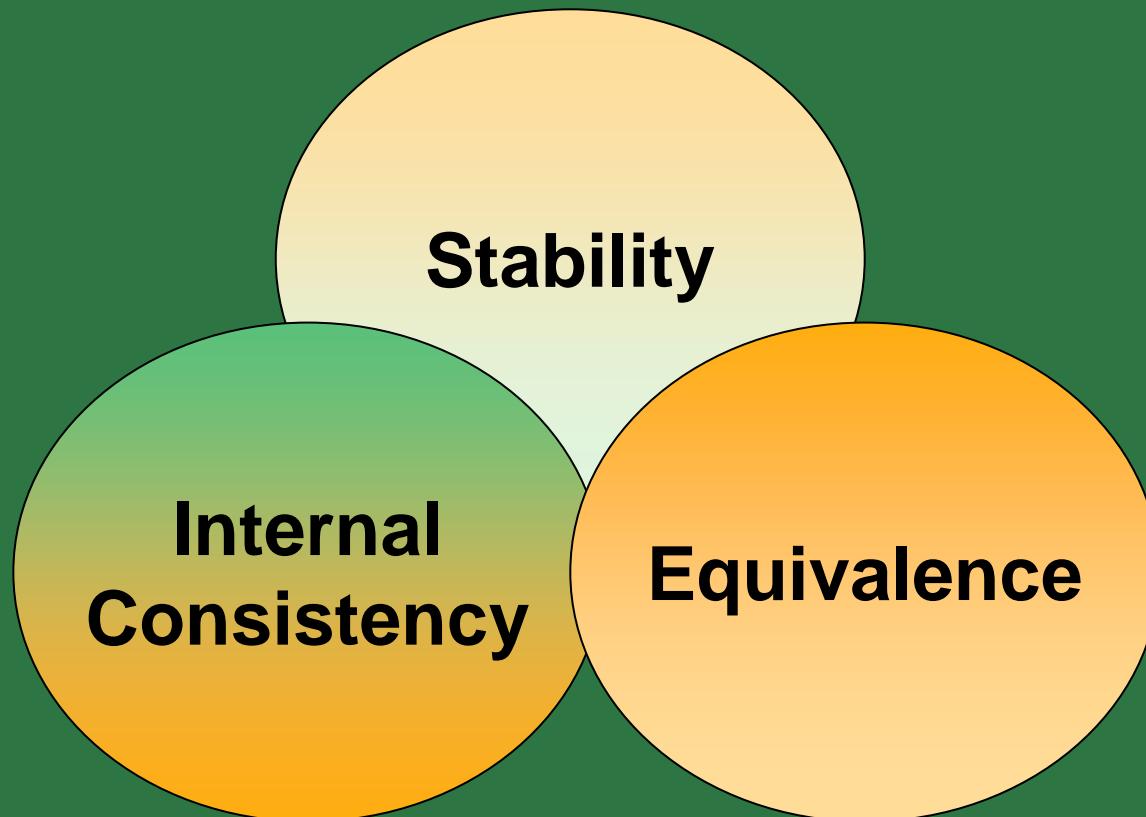
Reliability Estimates



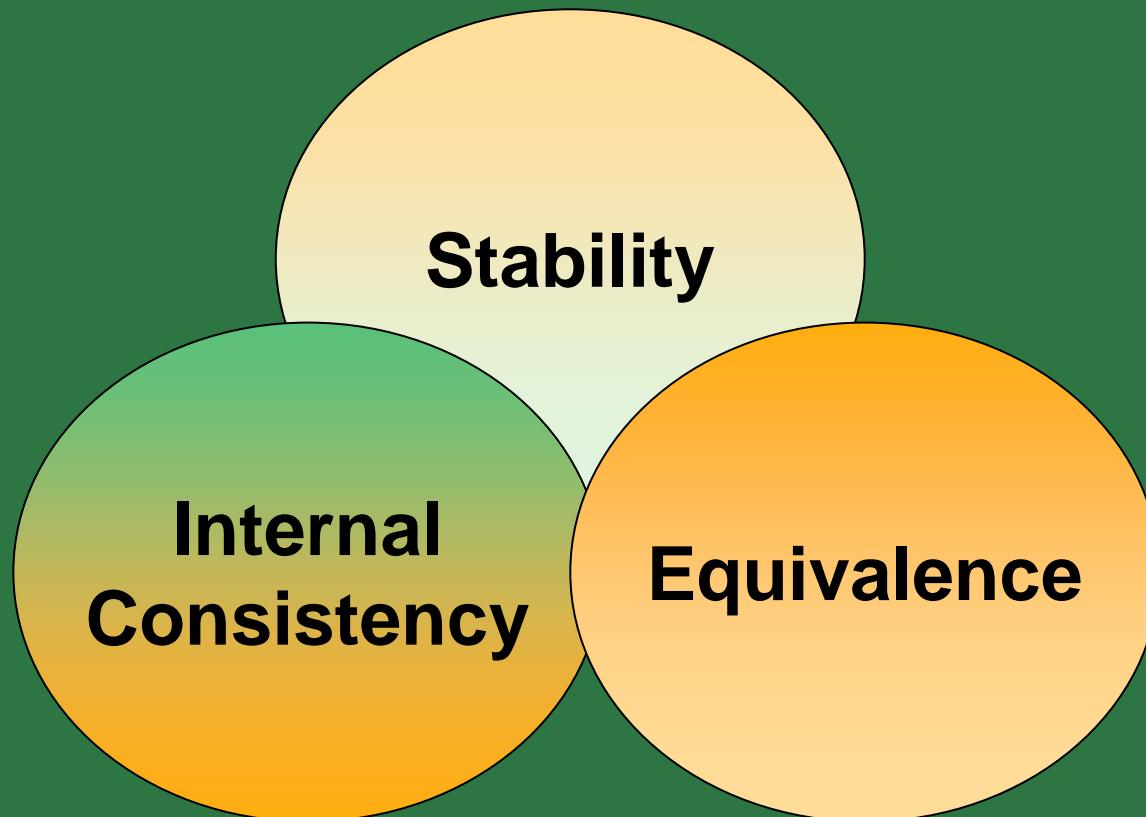
Reliability Estimates



Reliability Estimates



Reliability Estimates



Practicality

Economy

Convenience

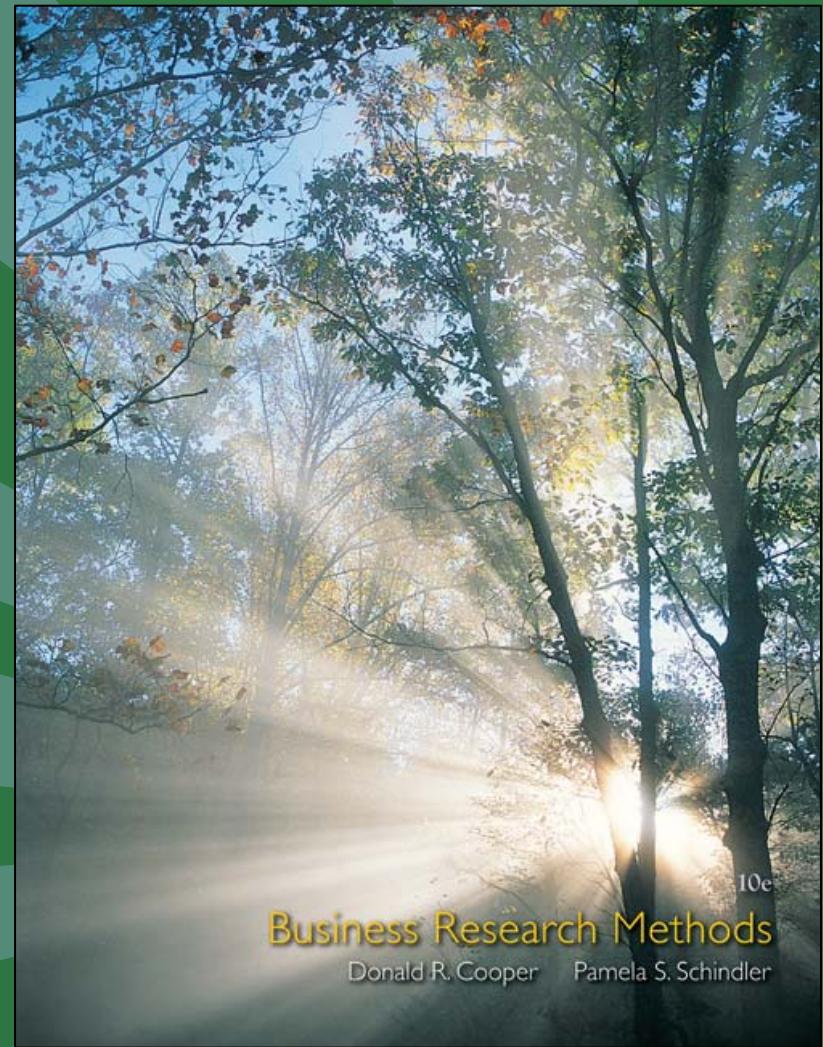
Interpretability

Key Terms

- Internal validity
- Interval scale
- Mapping rules
- Measurement
- Nominal scale
- Objects
- Ordinal scale
- Practicality
- Properties
- Ratio scale
- Reliability
 - Equivalence
 - Internal consistency
 - Stability
- Validity
 - Construct
 - Contents
 - Criterion-related

Chapter 12

Measurement Scales





Learning Objectives

Understand...

- The nature of attitudes and their relationship to behavior.
- The critical decisions involved in selecting an appropriate measurement scale.
- The characteristics and use of rating, ranking, sorting, and other preference scales.

PulsePoint: Research Revelation

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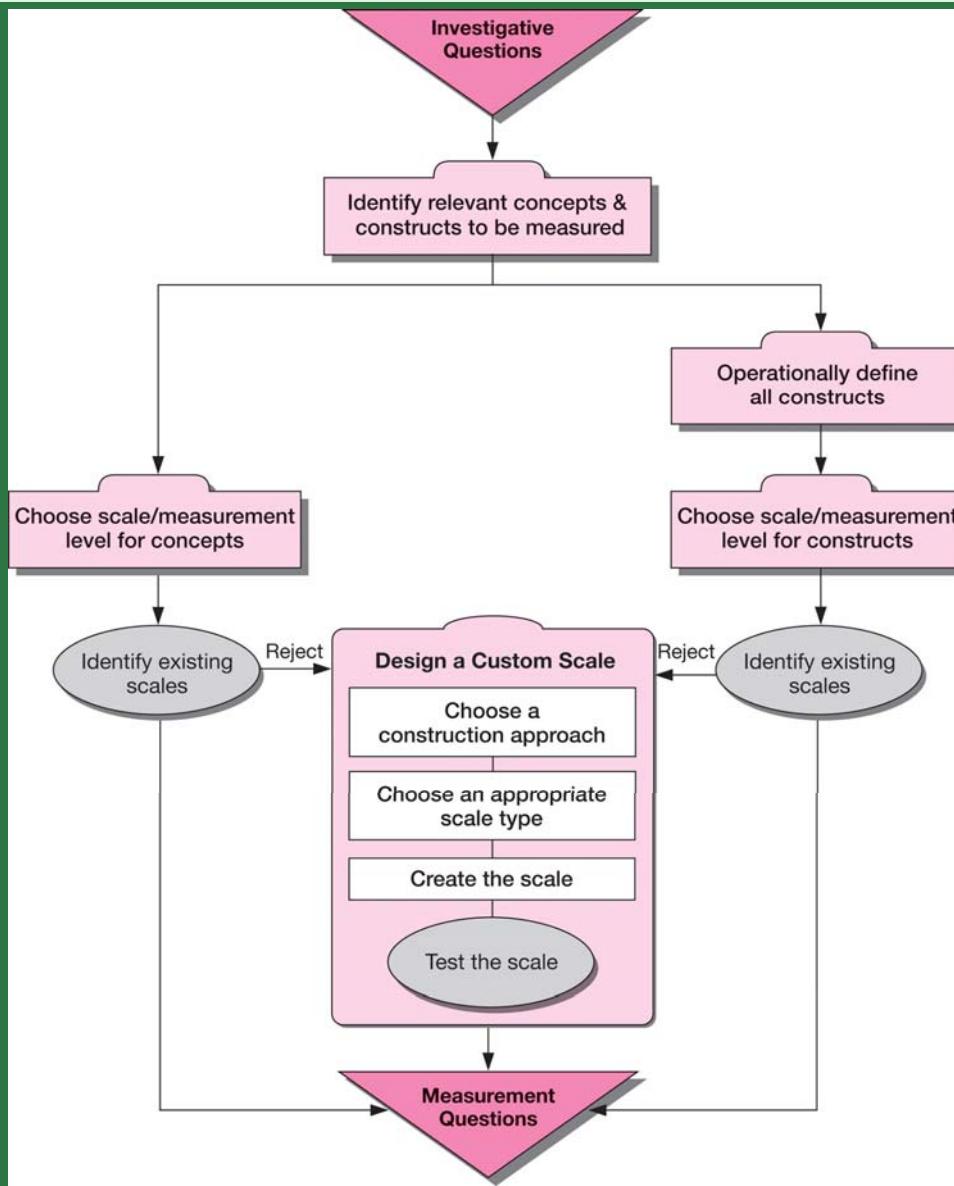
The percent that say they are '*generally positive*' or '*somewhat positive*' about the contributions that large corporations make to the public good.

Measurement Scales

“All survey questions must be actionable if you want results.”

*Frank Schmidt, senior scientist
The Gallup Organization*

The Scaling Process



Nature of Attitudes

Cognitive

I think oatmeal is healthier than corn flakes for breakfast.

Affective

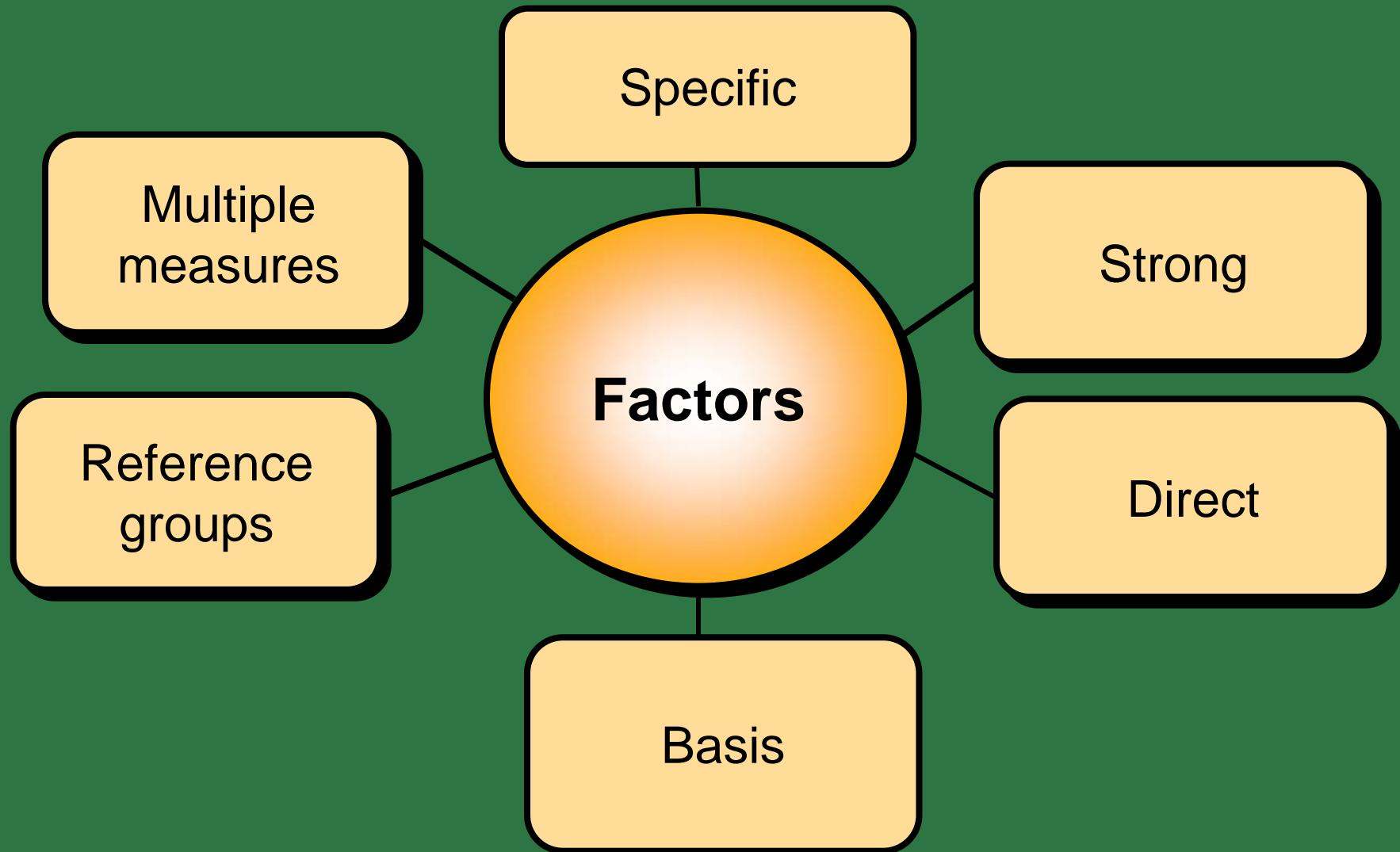
I hate corn flakes.

Behavioral

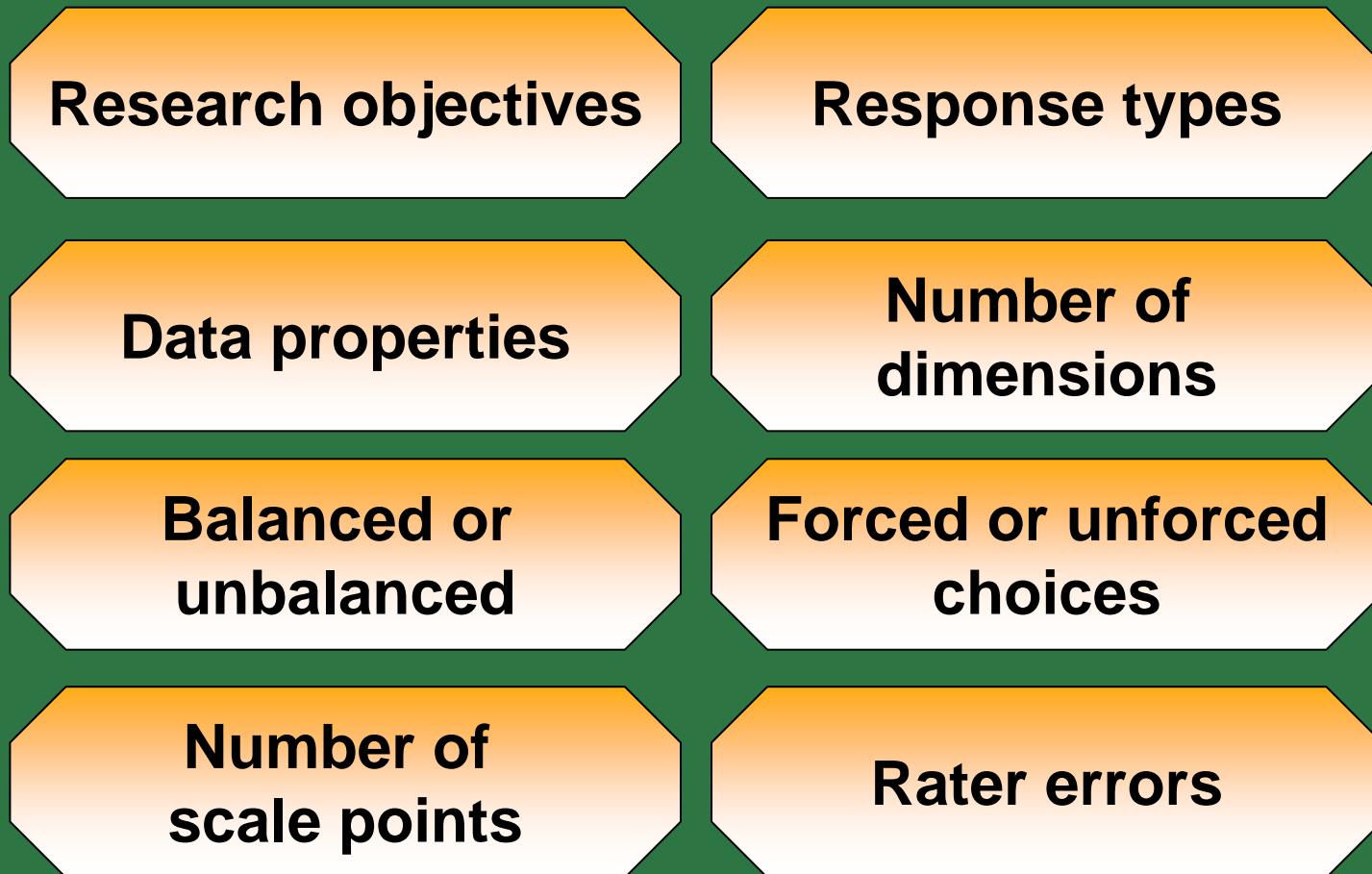
I intend to eat more oatmeal for breakfast.



Improving Predictability



Selecting a Measurement Scale



Response Types

Rating scale

Ranking scale

Categorization

Sorting

Number of Dimensions

Unidimensional

Multi-dimensional



Balanced or Unbalanced

How good an actress is Angelina Jolie?

- Very bad
- Bad
- Neither good nor bad
- Good
- Very good
- Poor
- Fair
- Good
- Very good
- Excellent

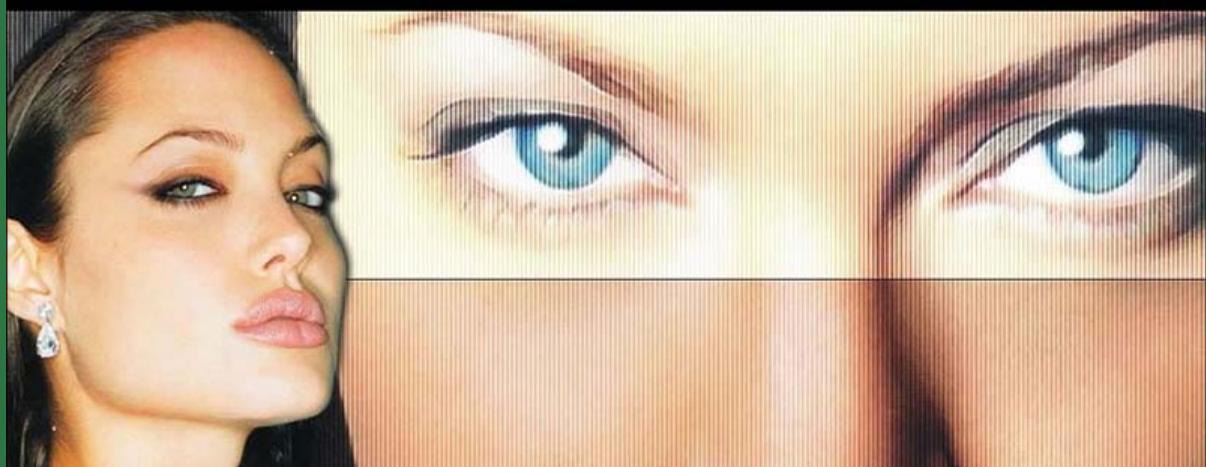
Forced or Unforced Choices

How good an actress is Angelina Jolie?

- Very bad
- Bad
- Neither good nor bad
- Good
- Very good

- Very bad
- Bad
- Neither good nor bad
- Good
- Very good
- No opinion
- Don't know

Number of Scale Points



How good an actress is Angelina Jolie?

- Very bad
- Bad
- Neither good nor bad
- Good
- Very good
- Very bad
- Somewhat bad
- A little bad
- Neither good nor bad
- A little good
- Somewhat good
- Very good

Rater Errors

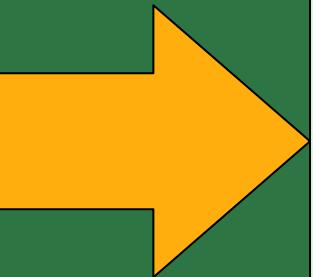
**Error of
central tendency**

Error of leniency

- Adjust strength of descriptive adjectives
- Space intermediate descriptive phrases farther apart
- Provide smaller differences in meaning between steps near the ends of the scale
- Use more scale points

Rater Errors

Primacy Effect
Recency Effect



- Reverse order of alternatives periodically

Dealing with Halo Effects

Halo Effects

- Rate one trait at a time
- Reveal one trait per page
- Reverse anchors periodically

Simple Category Scale



I plan to purchase a MindWriter laptop in the 12 months.

- Yes
- No

Multiple-Choice, Single-Response Scale



What newspaper do you read most often for financial news?

- East City Gazette
- West City Tribune
- Regional newspaper
- National newspaper
- Other (specify: _____)

Multiple-Choice, Multiple-Response Scale



What sources did you use when designing your new home? Please check all that apply.

- Online planning services
- Magazines
- Independent contractor/builder
- Designer
- Architect
- Other (specify: _____)

Likert Scale



The Internet is superior to traditional libraries for comprehensive searches.

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

Semantic Differential



Lands' End Catalog

FAST ____ : ____ : ____ : ____ : ____ : ____ : ____ : SLOW
HIGH QUALITY ____ : ____ : ____ : ____ : ____ : ____ : ____ : LOW QUALITY

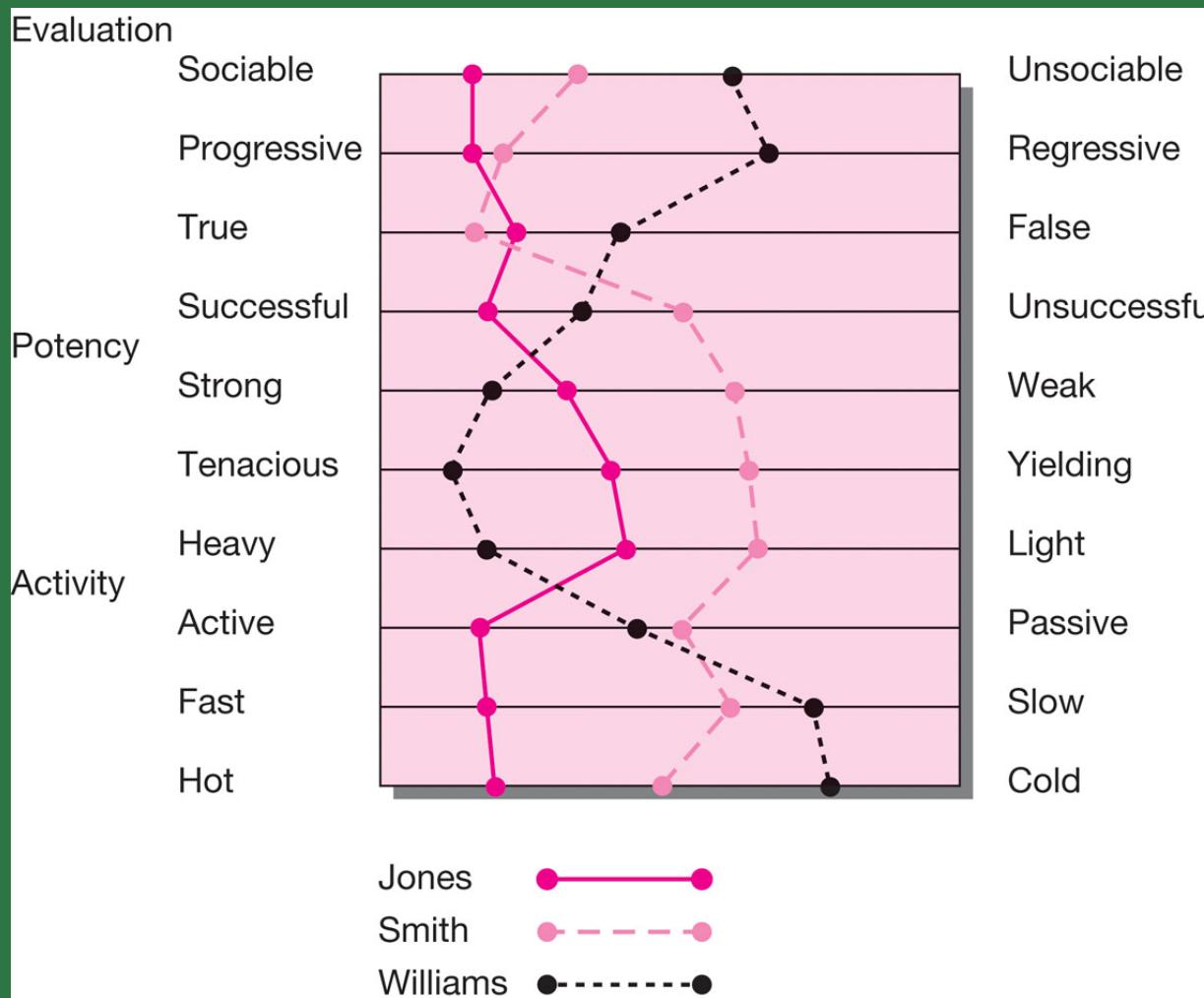
Adapting SD Scales

Convenience of Reaching the Store from Your Location		
Nearby	____:____:____:____:____:____:____:	Distant
Short time required to reach store	____:____:____:____:____:____:____:	Long time required to reach store
Difficult drive	____:____:____:____:____:____:____:	Easy Drive
Difficult to find parking place	____:____:____:____:____:____:____:	Easy to find parking place
Convenient to other stores I shop	____:____:____:____:____:____:____:	Inconvenient to other stores I shop
Products offered		
Wide selection of different kinds of products	____:____:____:____:____:____:____:	Limited selection of different kinds of products
Fully stocked	____:____:____:____:____:____:____:	Understocked
Undependable products	____:____:____:____:____:____:____:	Dependable products
High quality	____:____:____:____:____:____:____:	Low quality
Numerous brands	____:____:____:____:____:____:____:	Few brands
Unknown brands	____:____:____:____:____:____:____:	Well-known brands

SD Scale for Analyzing Actor Candidates

Analyze (candidate) for current position:

Graphic of SD Analysis



Numerical Scale



EXTREMELY
FAVORABLE

5

4

3

2

1

EXTREMELY
UNFAVORABLE

Employee's cooperation in teams ____
Employee's knowledge of task ____
Employee's planning effectiveness ____

Multiple Rating List Scales



"Please indicate how important or unimportant each service characteristic is":

	IMPORTANT				UNIMPORTANT		
Fast, reliable repair	7	6	5	4	3	2	1
Service at my location	7	6	5	4	3	2	1
Maintenance by manufacturer	7	6	5	4	3	2	1
Knowledgeable technicians	7	6	5	4	3	2	1
Notification of upgrades	7	6	5	4	3	2	1
Service contract after warranty	7	6	5	4	3	2	1

Stapel Scales

(Company Name)

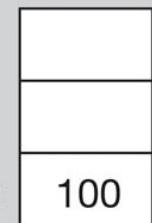
	+5	+5	+5
	+4	+4	+4
	+3	+3	+3
	+2	+2	+2
	+1	+1	+1
Technology Leader	Exciting Products	World-Class Reputation	
-1	-1	-1	-1
-2	-2	-2	-2
-3	-3	-3	-3
-4	-4	-4	-4
-5	-5	-5	-5

Constant-Sum Scales



“Taking all the supplier characteristics we’ve just discussed and now considering cost, what is their relative importance to you (dividing 100 units between)”:

Being one of the lowest-cost suppliers



All other aspects of supplier performance

Sum

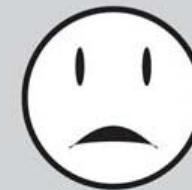
Graphic Rating Scales

"How likely are you to recommend CompleteCare to others?" (Place an X at the position along the line that best reflects your judgment.)

VERY LIKELY



VERY UNLIKELY



(alternative with graphic)

Ranking Scales

- Paired-comparison scale
- Forced ranking scale
- Comparative scale



Paired-Comparison Scale

“For each pair of two-seat sports cars listed, place a check beside the one you would most prefer if you had to choose between the two.”

- BMW Z4 M Coupe
- Porsche Cayman S

- Chevrolet Corvette Z06
- Porsche Cayman S

- Chevrolet Corvette Z06
- BMW Z4 M Coupe

- Porsche Cayman S
- Dodge Viper SRT10

- Chevrolet Corvette Z06
- Dodge Viper SRT10

- Dodge Viper SRT10
- BMW Z4 M Coupe

Forced Ranking Scale



“Rank the radar detection features in your order of preference. Place the number 1 next to the most preferred, 2 by the second choice, and so forth.”

- User programming
- Cordless capability
- Small size
- Long-range warning
- Minimal false alarms

Comparative Scale



“Compared to your previous hair dryer’s performance, the new one is”:

SUPERIOR

ABOUT THE SAME

INFERIOR

1

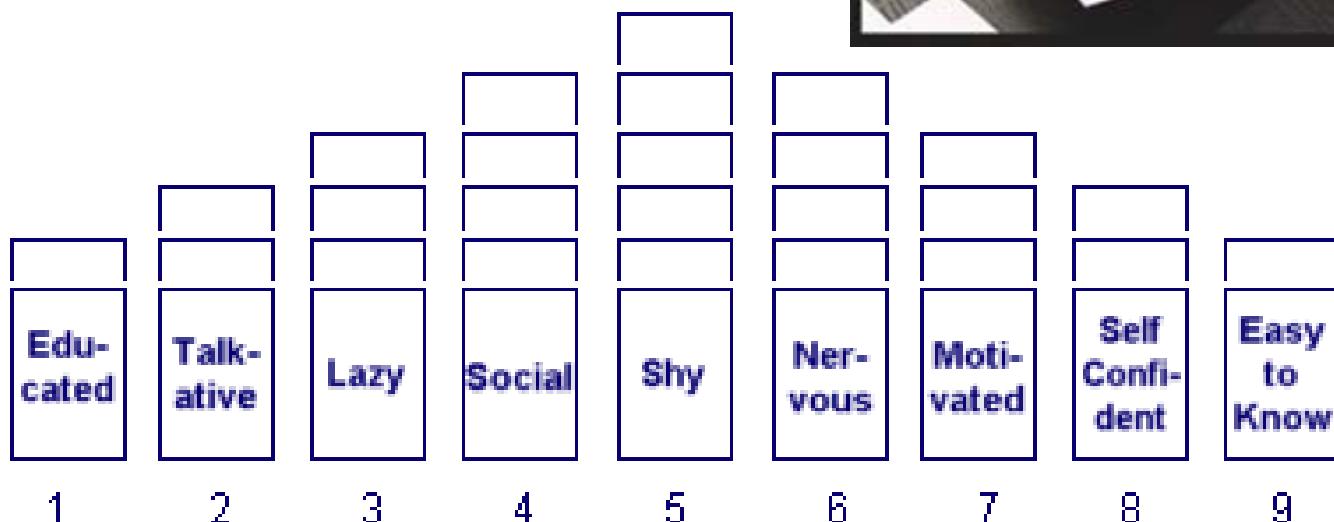
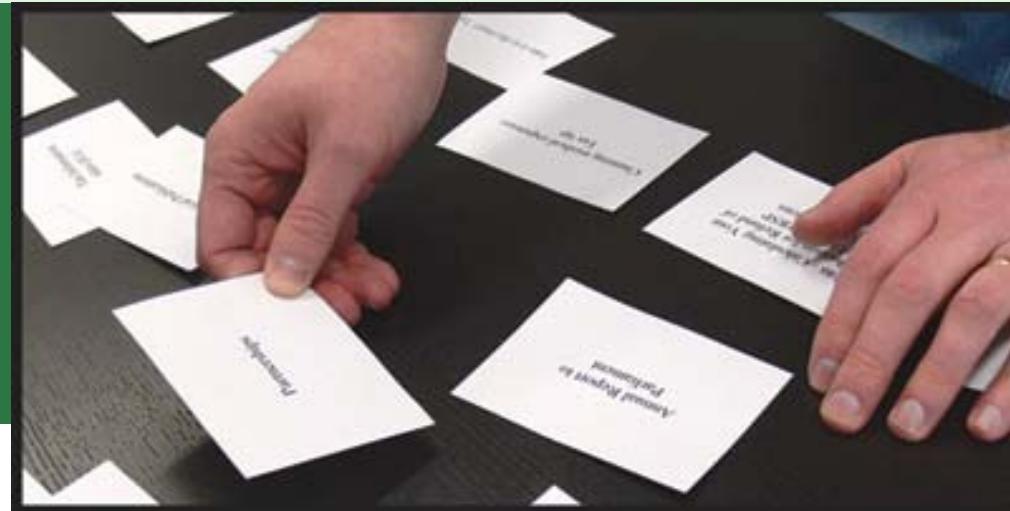
2

3

4

5

Sorting



Example of a Q-Sort

MindWriter Scaling

Likert Scale

The problem that prompted service/repair was resolved

Strongly
Disagree
1

Disagree
2

Neither Agree
Nor Disagree
3

Agree
4

Strongly
Agree
5

Numerical Scale (MindWriter's Favorite)

To what extent are you satisfied that the problem that prompted service/repair was resolved?

Very
Dissatisfied
1

2

3

4

Very
Satisfied
5

Hybrid Expectation Scale

Resolution of the problem that prompted service/repair.

Met Few
Expectations
1

Met Some
Expectations
2

Met Most
Expectations
3

Met All
Expectations
4

Exceeded
Expectations
5

Ideal Scalogram Pattern

Item					
2	4	1	3	Participant Score	
X	X	X	X	4	
—	X	X	X	3	
—	—	X	X	2	
—	—	—	X	1	
—	—	—	—	0	

* X = agree; — = disagree.

Key Terms

- Attitude
- Balanced rating scale
- Categorization
- Comparative scale
- Constant-sum scale
- Cumulative scale
- Error of central tendency
- Error of leniency
- Forced-choice rating scale
- Forced ranking scale
- Graphic rating scale
- Halo effect
- Item analysis
- Likert scale
- Multidimensional scale

Key Terms

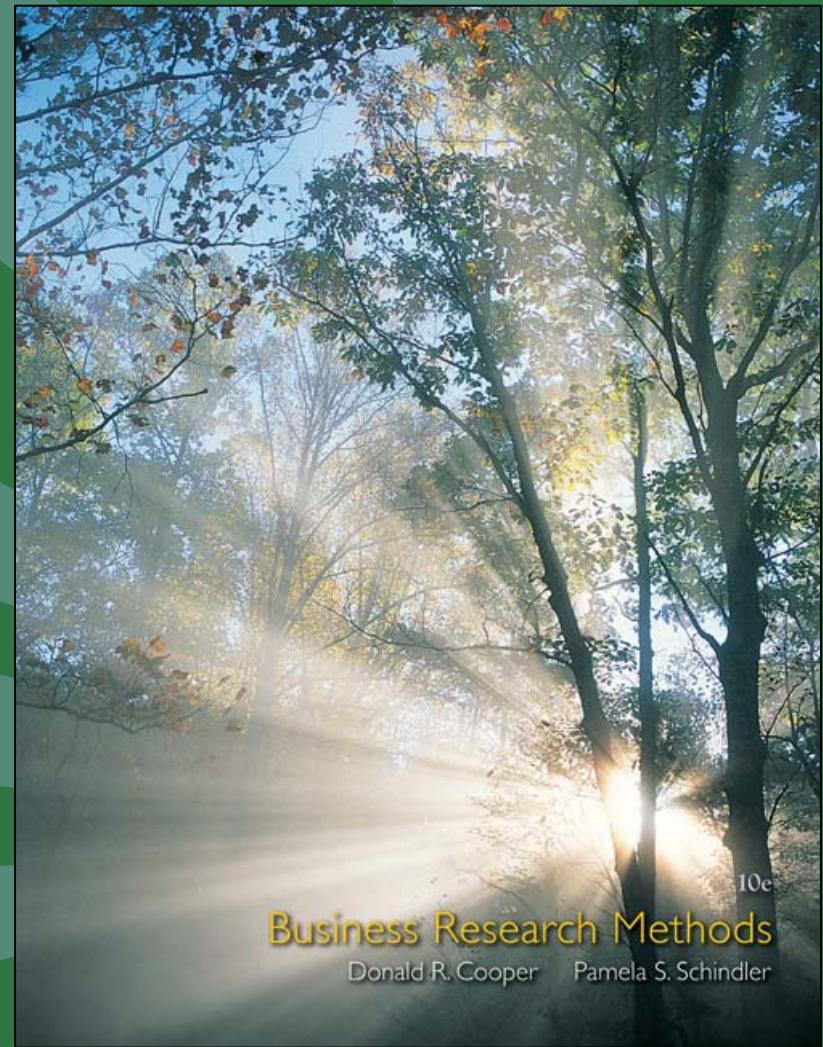
- Multiple-choice, multiple-response scale
- Multiple-choice, single-response scale
- Multiple rating list
- Numerical scale
- Paired-comparison scale
- Q-sort
- Ranking scale
- Rating scale
- Scaling
- Scalogram analysis
- Semantic differential
- Simple category scale

Key Terms

- Sorting
- Stapel scale
- Summated rating scale
- Unbalanced rating scale
- Unforced-choice rating scale
- Unidimensional scale

Chapter 13

Questionnaires and Instruments





Learning Objectives

Understand...

- The link forged between the management dilemma and the communication instrument by the management-research question hierarchy.
- The influence of the communication method on instrument design.
- The three general classes of information and what each contributes to the instrument.



Learning Objectives

Understand . . .

- The influence of question content, question wording, response strategy, and preliminary analysis planning on question construction.
- Each of the numerous question design issues influencing instrument quality, reliability, and validity.
- The sources for measurement questions
- The importance of pretesting questions and instruments.

PulsePoint: Research Revelation

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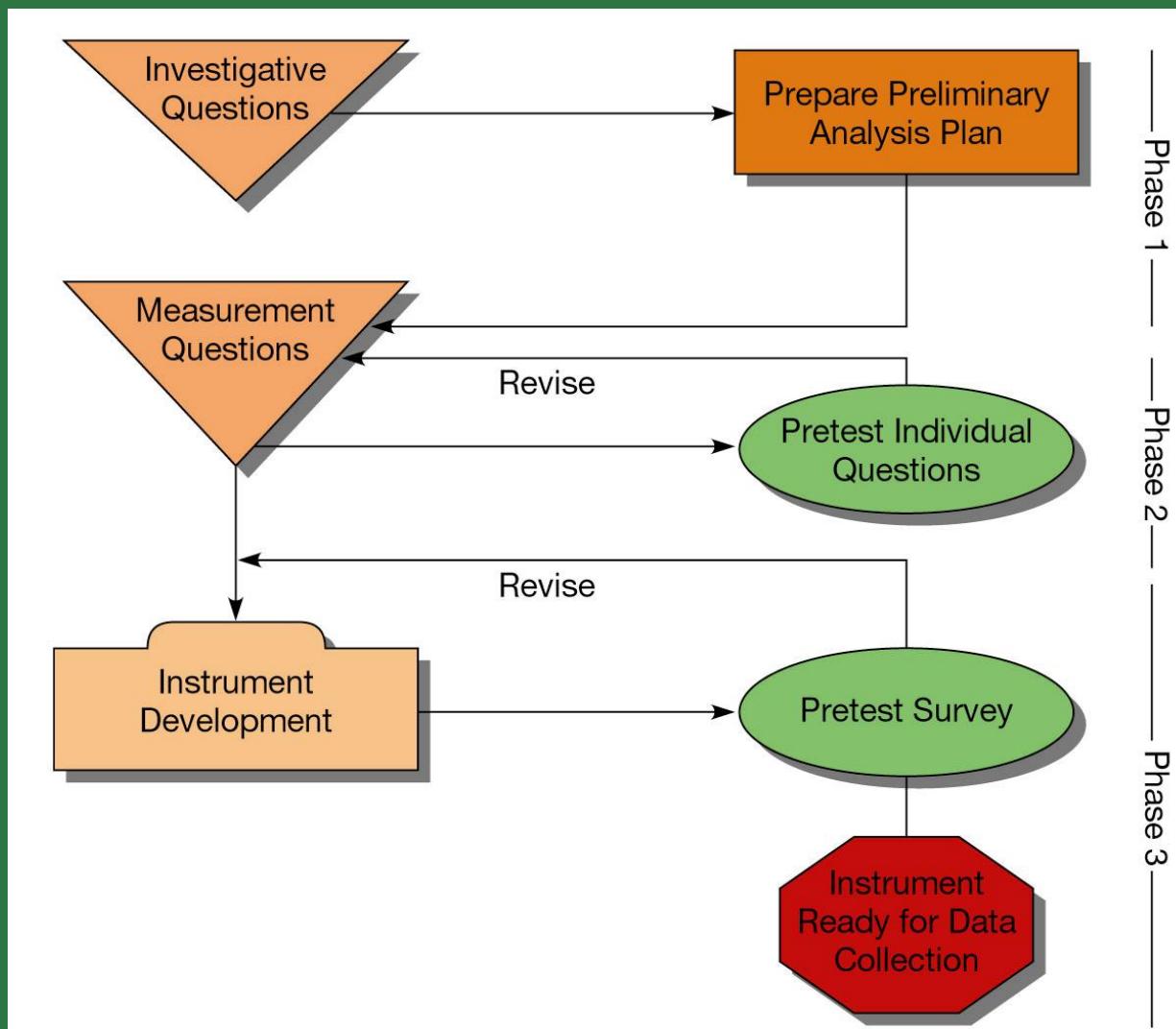
The percent of people using consumer e-commerce sites who accomplish what they set out to do.

Measurement Scales

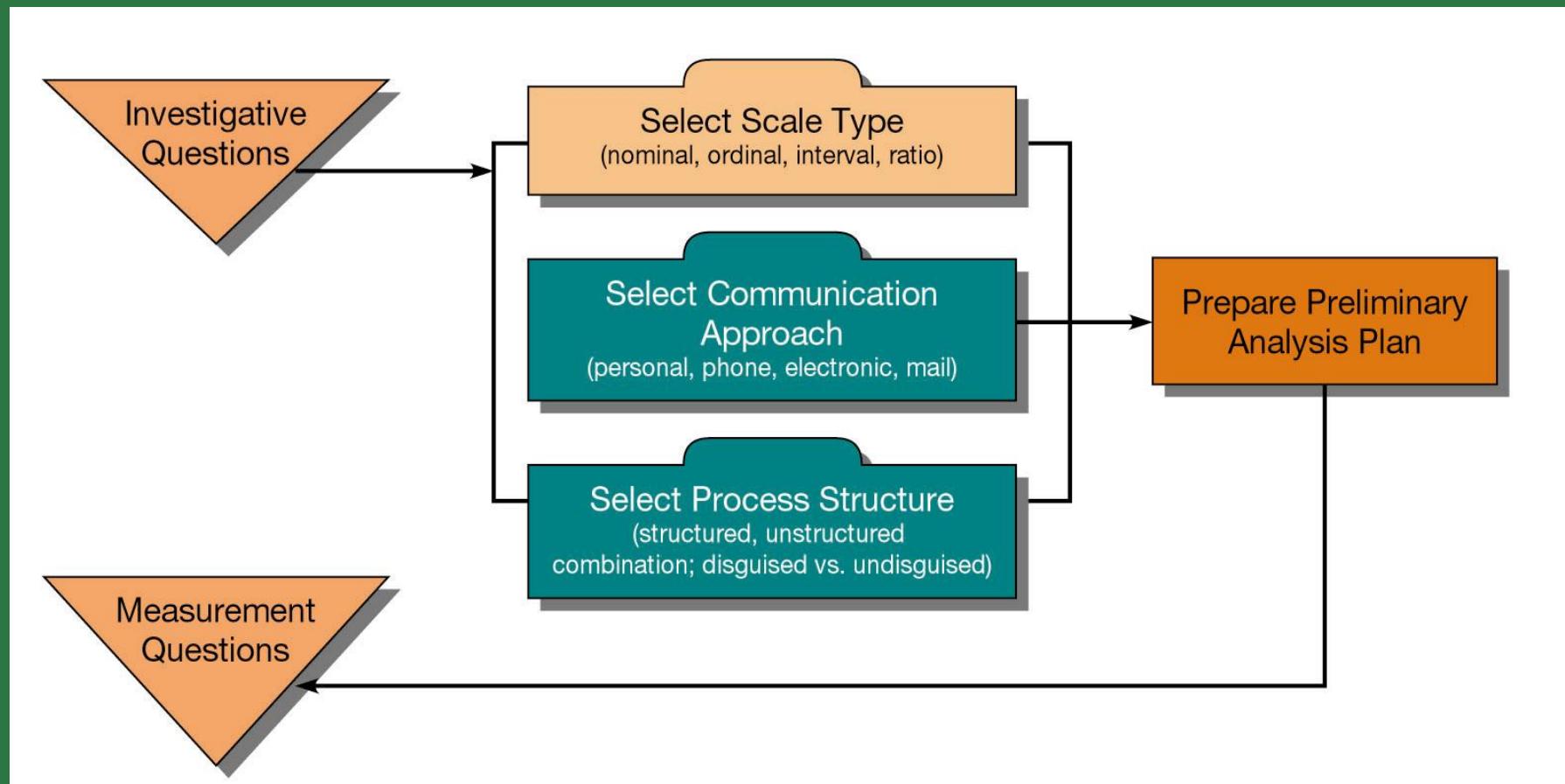
“Participants are becoming more and more aware of the value of their time. The key to maintaining a quality dialog with them is to make it really convenient for them to engage, whenever and wherever they want.”

Tom Anderson, managing partner
Anderson Analytics

Overall Flowchart for Instrument Design



Flowchart for Instrument Design Phase 1





Strategic Concerns in Instrument Design

What type of scale is needed?

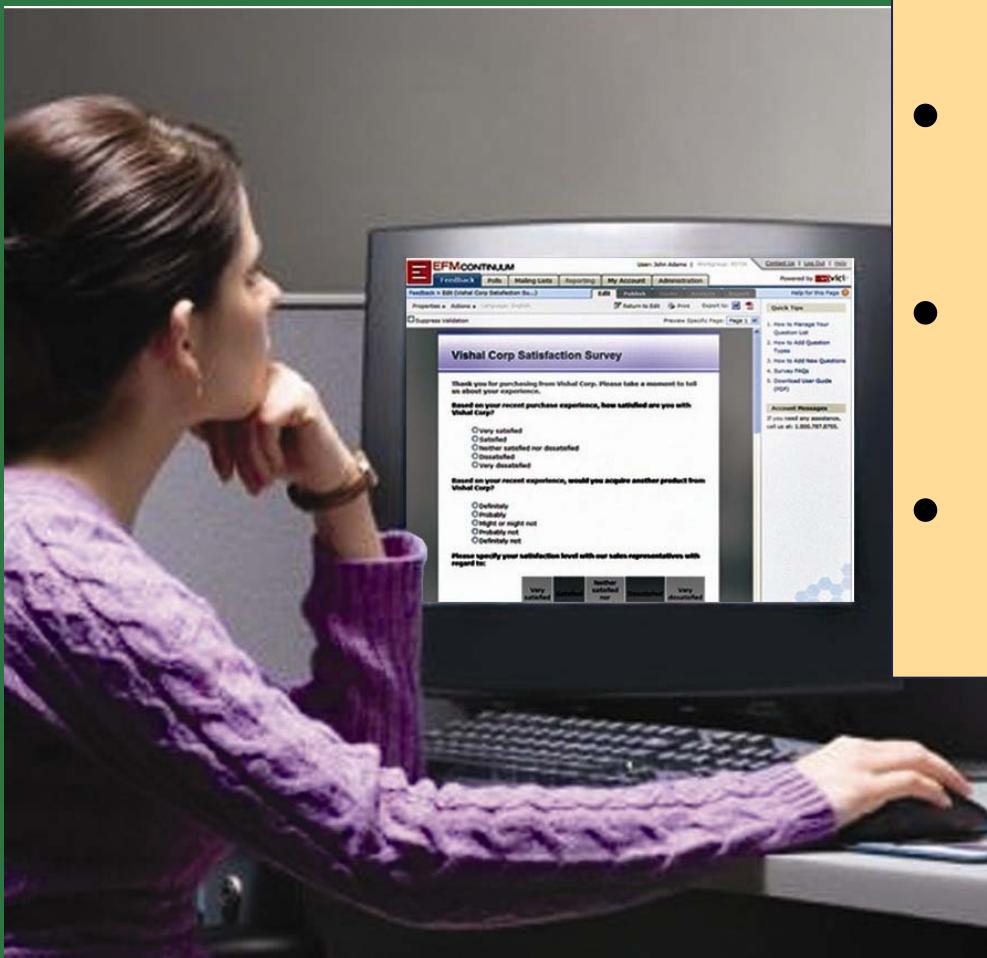
What communication approach will be used?

Should the questions be structured?

Should the questioning be disguised?

Technology Affects Questionnaire Development

- Write questionnaires more quickly
- Create visually driven instruments
- Eliminate manual data entry
- Save time in data analysis



Disguising Study Objectives

Reluctantly shared,
Conscious-level
information

Willingly shared,
Conscious-level
information

**Situations
where
disguise is
unnecessary**

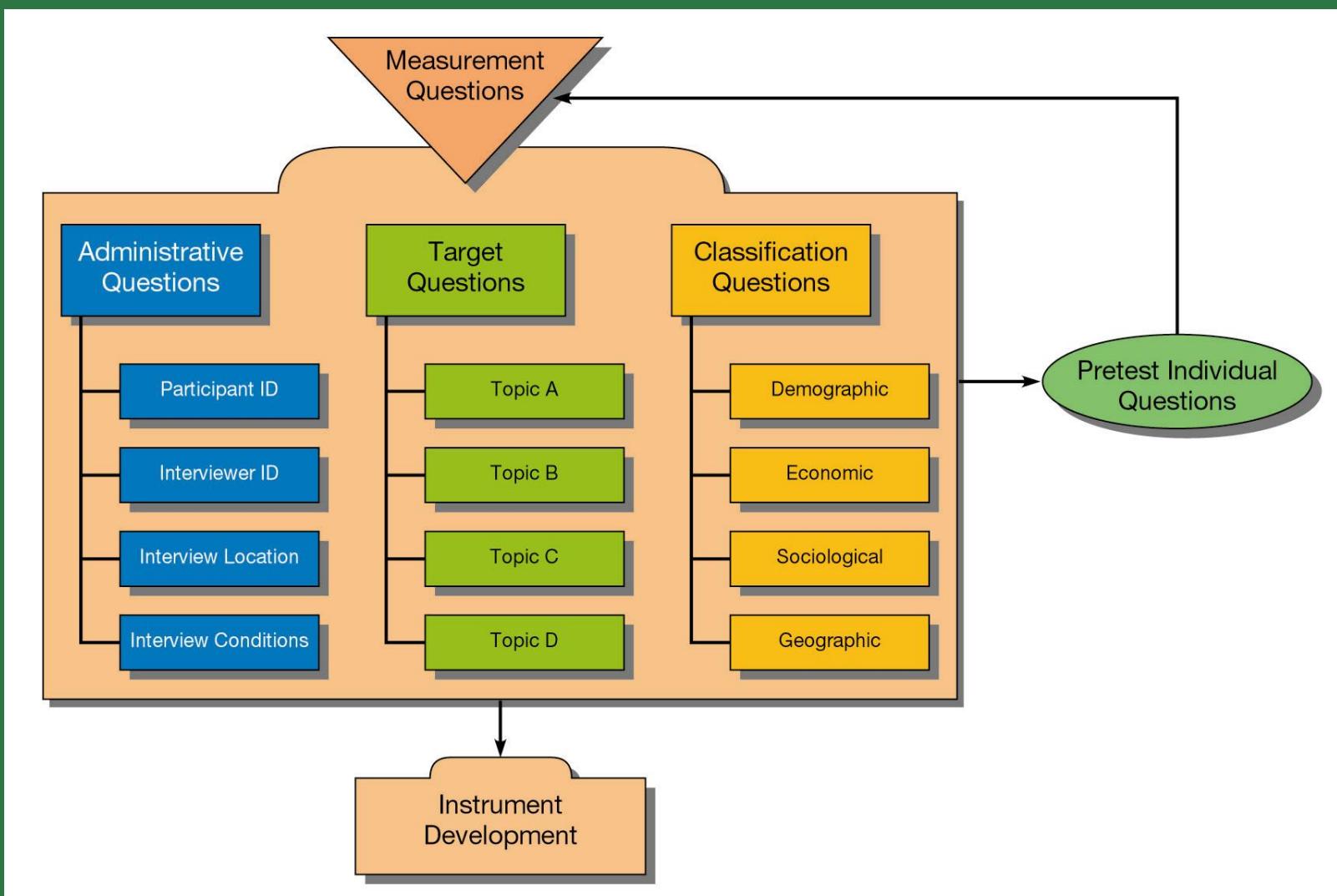
Knowable,
Limited-conscious-
level information

Subconscious-level
information

Dummy Table for American Eating Habits

Age	Use of Convenience Foods				
	Always Use	Use Frequently	Use Sometimes	Rarely Use	Never Use
18-24					
25-34					
35-44					
55-64					
65+					

Flowchart for Instrument Design Phase 2



Question Categories and Structure

Administrative

Classification

Target



Question Content

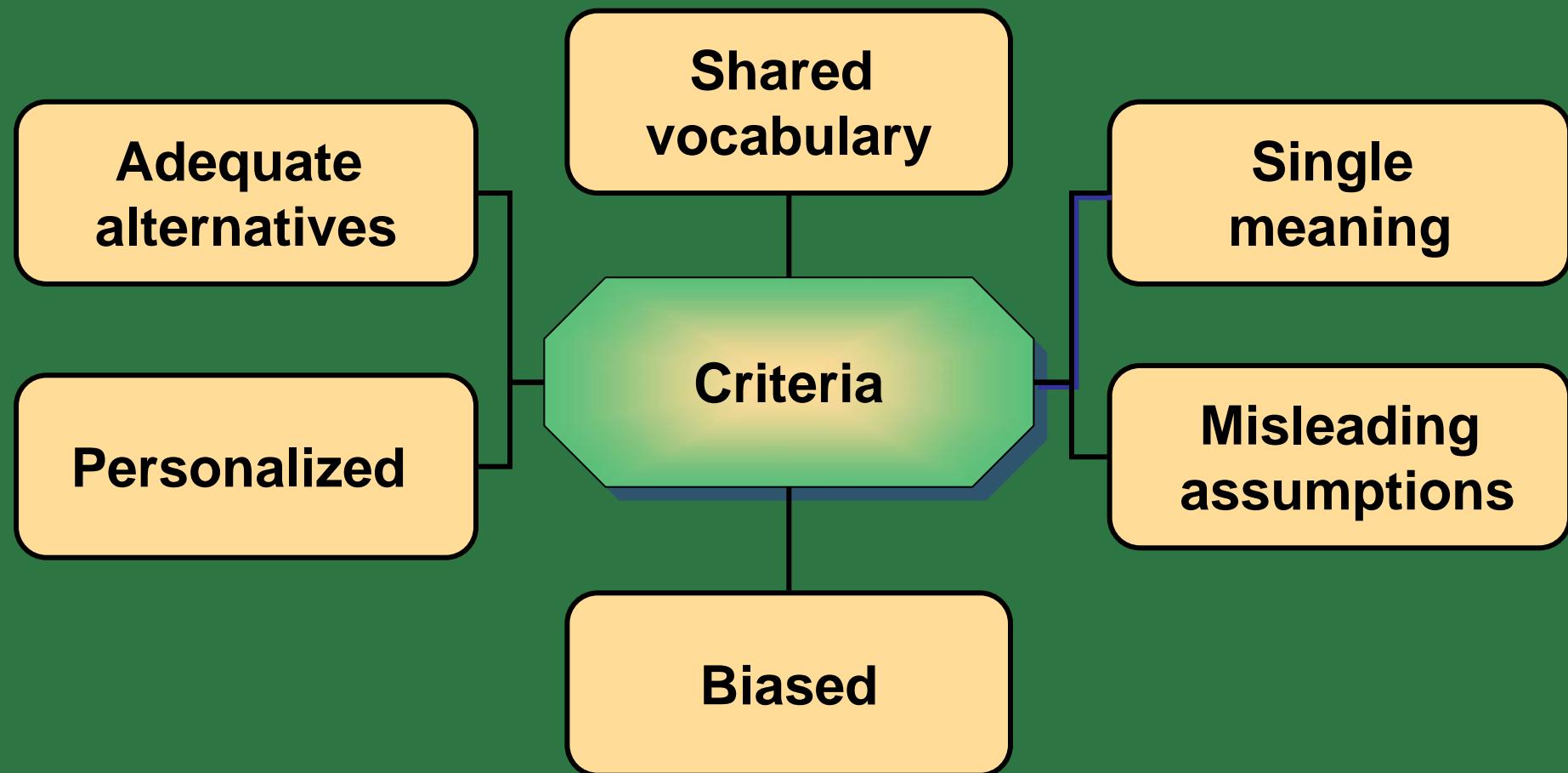
Should this question be asked?

Is the question of proper scope and coverage?

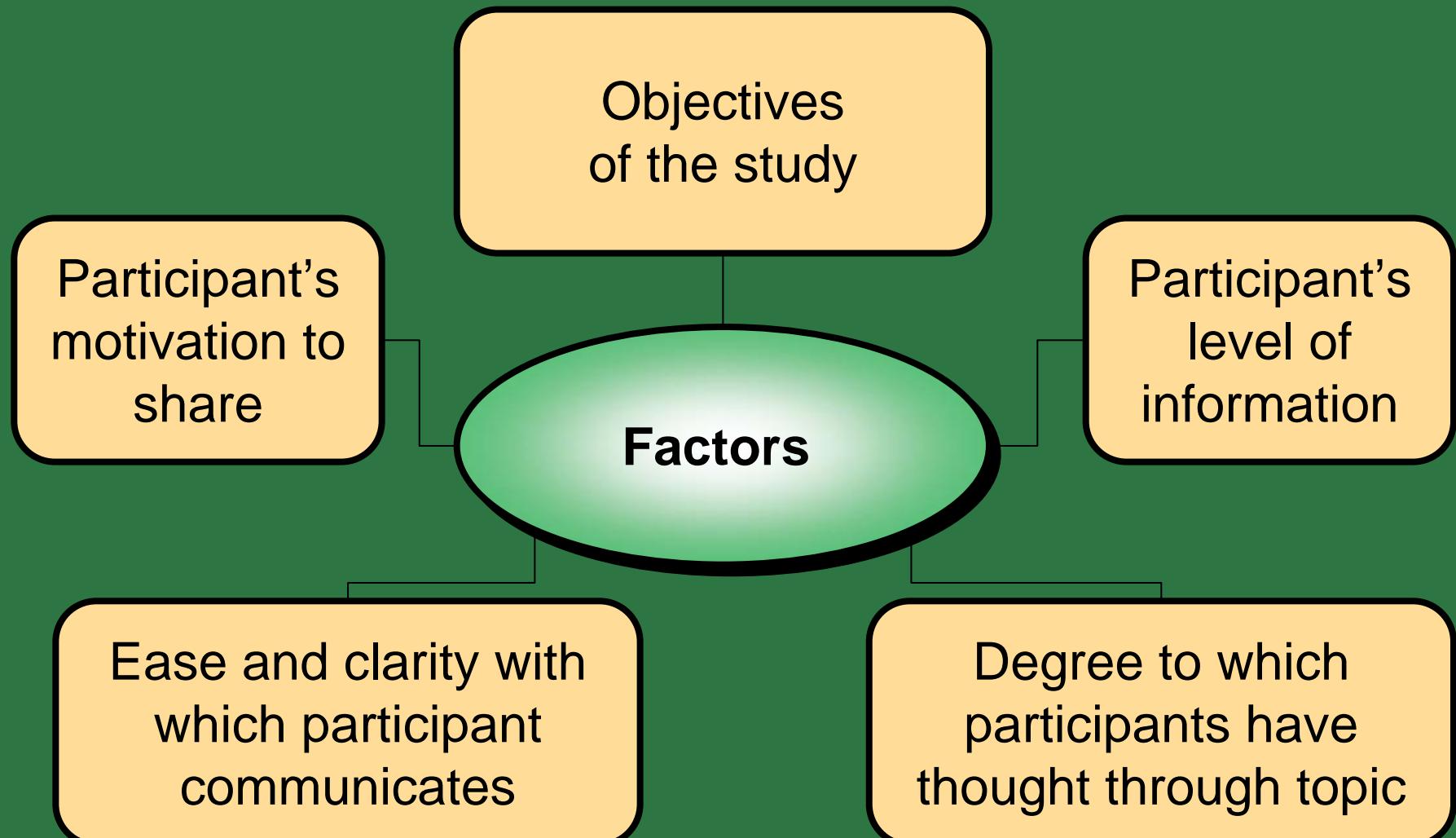
Can the participant adequately answer this question as asked?

Will the participant willingly answer this question as asked?

Question Wording



Response Strategy



Free-Response Strategy



What factors influenced your enrollment in Metro U?

Dichotomous Response Strategy



Did you attend the “A Day at College” program at Metro U?

- Yes
- No

Multiple Choice Response Strategy



Which one of the following factors was most influential in your decision to attend Metro U?

- Good academic standing**
- Specific program of study desired**
- Enjoyable campus life**
- Many friends from home**
- High quality of faculty**

Checklist Response Strategy



Which of the following factors influenced your decision to enroll in Metro U? (Check all that apply.)

- Tuition cost**
- Specific program of study desired**
- Parents' preferences**
- Opinion of brother or sister**
- Many friends from home attend**
- High quality of faculty**

Rating Response Strategy

	Strongly influential	Somewhat influential	Not at all influential
Good academic reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enjoyable campus life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Many friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High quality faculty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Semester calendar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ranking

Please rank-order your top three factors from the following list based on their influence in encouraging you to apply to Metro U. Use 1 to indicate the most encouraging factor, 2 the next most encouraging factor, etc.

Opportunity to play collegiate sports

Closeness to home

Enjoyable campus life

Good academic reputation

High quality of faculty



Summary of Scale Types

Type	Restrictions	Scale Items	Scale points	Data Type
Rating Scales				
Simple Category Scale	Needs mutually exclusive choices	One or more	2	Nominal
Multiple Choice Single-Response Scale	Needs mutually exclusive choices; may use exhaustive list or 'other'	many	2	Nominal
Multiple Choice Multiple-Response Scale (checklist)	Needs mutually exclusive choices; needs exhaustive list or 'other'	many	2	Nominal
Likert Scale	Needs definitive positive or negative statements with which to agree/disagree	One or more	5	Ordinal
Likert-type Scale	Needs definitive positive or negative statements with which to agree/disagree	One or more	7 or 9	Ordinal

Summary of Scale Types

Type	Restrictions	Scale Items	Scale points	Data Type
Semantic Differential Scale	Needs words that are opposites to anchor the graphic space.	One or more	7	Ordinal
Numerical Scale	Needs concepts with standardized or defined meanings; needs numbers anchor the end-points or points along the scale; score is a measurement of graphical space from one anchor.	One or many	3-10	Ordinal or Interval
Multiple Rating List Scale	Needs words that are opposites to anchor the end-points on the verbal scale	Up to 10	5-7	Ordinal
Fixed Sum Scale	Participant needs ability to calculate total to some fixed number, often 100.	Two or more	none	Interval or Ratio
Stapel Scale	Needs verbal labels that are operationally defined or standard.	One or more	10	Ordinal or Interval
Graphic Rating Scale	Needs visual images that can be interpreted as positive or negative anchors; score is a measurement of graphical space from one anchor.	One or more	none	Ordinal (Interval, or Ratio)

Summary of Scale Types

Type	Restrictions	Scale Items	Scale points	Data Type
Ranking Scales				
Paired Comparison Scale	Number is controlled by participant's stamina and interest.	Up to 10	2	Ordinal
Forced Ranking Scale	Needs mutually exclusive choices.	Up to 10	many	Ordinal or Interval
Comparative Scale	Can use verbal or graphical scale.	Up to 10		Ordinal

Internet Survey Scale Options

What ONE magazine do you read most often for computing news?

Please select your answer

PC Magazine

Wired

Computing Magazine

Computing World

PC Computing

Laptop

Multiple Choice, Single Response
using pull-down box

Checklist

using checkbox

(may also use radio buttons)

Which of the following computing magazines did you look at in the last 30 days?

- PC Magazine
- Wired
- Computing Magazine
- Computing World
- PC Computing
- Laptop

Internet Survey Scale Options

Where have you seen advertising for MindWriter laptop computers?

Free Response/Open Question
using textbox

Dichotomous Question
using radio buttons
(may also use pull-down box)

I plan to purchase a MindWriter laptop in the next 3 months.

- Yes
- No

My next laptop computer will have . . .

- More memory.
- More processing speed.

Paired Comparison
using radio buttons
(may also use pull-down box)

Multiple Choice, Single
Response
using radio buttons
(may also use pull-down box
or checkbox)

What ONE magazine do you read most often for computing news?

- PC Magazine
- Wired
- Computing Magazine
- Computing World
- PC Computing
- Laptop

Internet Survey Scale Options

Please indicate the importance of each of the characteristics in choosing your next laptop.
 [Select one answer in each row. Scroll to see the complete list of options.]

	Very Important	Neither Important nor Unimportant	Not at all Important	
Fast reliable repair service	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> v
Service at my location	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance by the manufacturer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knowledgeable technicians	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Notification of upgrades	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> ^

Rating Grid

(may also use checkboxes)

Requires a single response per line.
 The longer the list, the more likely the participant must scroll.

Ranking Question
 using pull-down box
 (may also use textboxes, in which ranks are entered)
 [This question asks for a limited ranking of only three of the listed elements.]

From the list below, please choose the three most important service options when choosing your next laptop.

- Fast reliable repair service
- Service at my location
- Maintenance by the manufacturer
- Knowledgeable technicians
- Notification of upgrades

— v

—

1

2

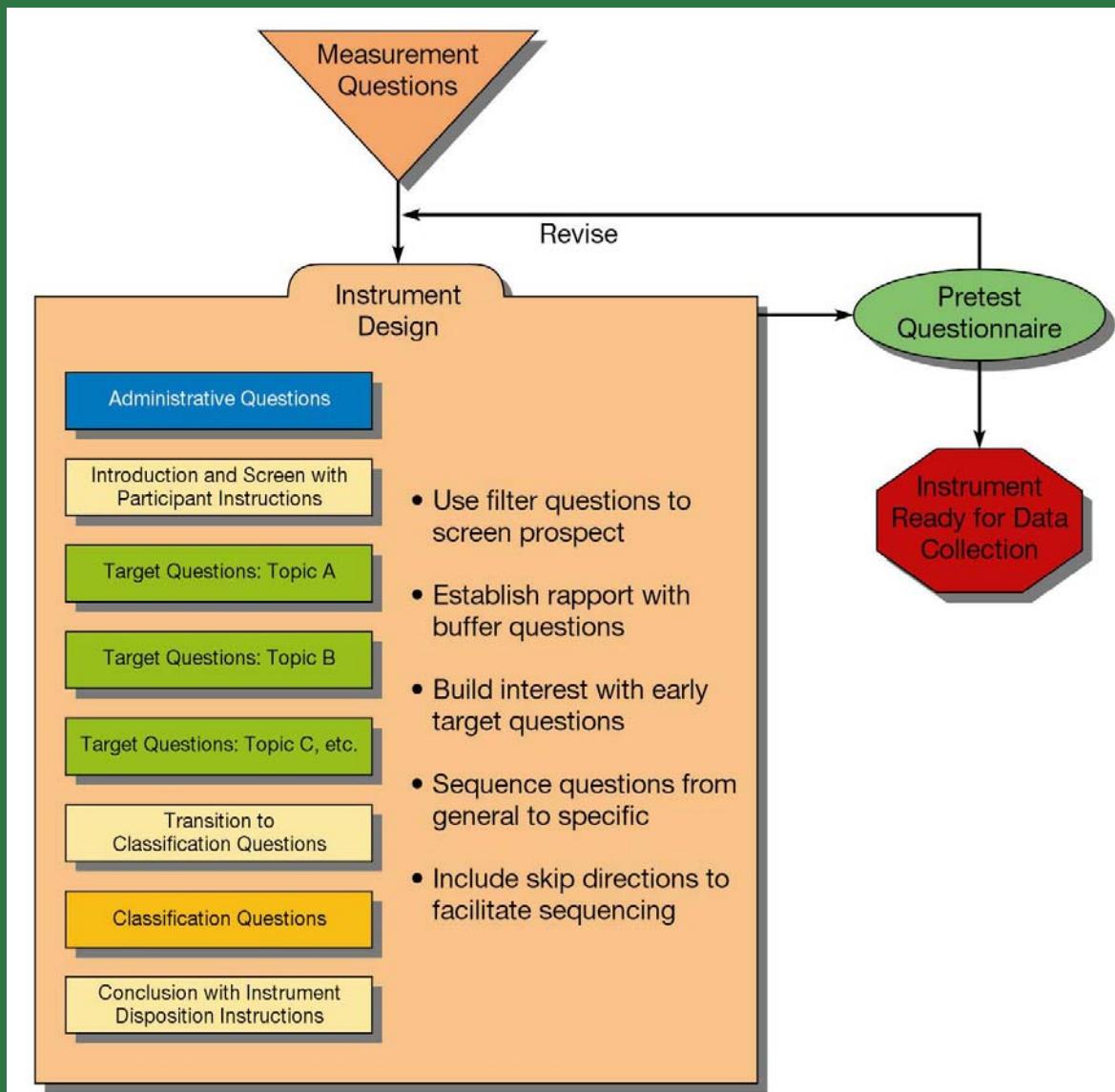
3

— v

Sources of Questions

- Handbook of Marketing Scales
- The Gallup Poll Cumulative Index
- Measures of Personality and Social-Psychological Attitudes
- Measures of Political Attitudes
- Index to International Public Opinion
- Sourcebook of Harris National Surveys
- Marketing Scales Handbook
- American Social Attitudes Data Sourcebook

Flowchart for Instrument Design Phase 3



Guidelines for Question Sequencing

Interesting topics early

Classification questions later

Sensitive questions later

Simple items early

Transition between topics

Reference changes limited

Illustrating the Funnel Approach

- How do you think this country is getting along in its relations with other countries?
- How do you think we are doing in our relations with Iran?
- Do you think we ought to be dealing with Iran differently than we are now?
- (If yes) What should we be doing differently?
- Some people say we should get tougher with Iran and others think we are too tough as it is; how do you feel about it?

Branching Question

2. Which of the following attributes do you like about the automobile you just saw? (Select all that apply)

- Overall appeal
- Headroom
- Design
- Color
- Height from the ground
- Other
- None of the above

[Next Question](#)

3. For those items that you selected, how important is each? (Provide one answer for each attribute)

	Extremely important	Neither important nor not important	Not at all important	Don't know
a) Overall appeal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Height from the ground	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Headroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Components of Questionnaires

Component	Example
Introduction	Good evening. May I please speak with (name of participant)? Mr. (participant's last name), I'm (your name), calling on behalf of MindWriter Corporation. You recently had your MindWriter laptop serviced at our CompleteCare Center. Could you take five minutes to tell us what you thought of the service provided by the center?
Transition	The next set of questions asks about your family and how you enjoy spending your nonworking or personal time.
Instructions for . . . a. Terminating (following filter or screen question)	I'm sorry, today we are only talking with individuals who eat cereal at least three days per week, but thank you for speaking with me. (Pause for participant reply.) Good-bye.
b. Participant discontinue	Would there be a time I could call back to complete the interview? (Pause; record time.) We'll call you back then at (repeat day, time). Thank you for talking with me this evening. Or: I appreciate your spending some time talking with me. Thank you.
c. Skip directions (between questions or groups of questions)	3. Did you purchase boxed cereal in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No (skip to question 7)
d. Disposition instructions	A postage-paid envelope was included with your survey. Please refold your completed survey and mail it to us in the postage-paid envelope.
Conclusion a. Phone or personal interview	That's my last question. Your insights and the ideas of other valuable customers will help us to make the CompleteCare program the best it can be.
b. Self-administered (usually precedes the disposition instructions)	Thank you for talking with us this evening. (Pause for participant reply). Good evening. Thank you for sharing your ideas about the CompleteCare program. Your insights will help us serve you better.

MindWriter Survey

MindWriter personal computers offer you ease of use and maintenance. When you need service, we want you to rely on **CompleteCare**, wherever you may be. That's why we're asking you to take a moment to tell us how well we've served you.

	Met few expectations	Met some expectations	Met most expectations	Met all expectations	Exceeded expectations
	1	2	3	4	5
1. Telephone assistance with your problem:					
a. Responsiveness	1	2	3	4	5
b. Technical competence	1	2	3	4	5
2. The courier service's effectiveness:					
a. Arrangements	1	2	3	4	5
b. Pickup speed	1	2	3	4	5
c. Delivery speed	1	2	3	4	5
3. Speed of the overall repair process.	1	2	3	4	5
4. Resolution of the problem that prompted service/repair.	1	2	3	4	5
5. Condition of your MindWriter on arrival.	1	2	3	4	5
6. Overall impression of CompleteCare's effectiveness.	1	2	3	4	5
7. Likelihood of using CompleteCare on another occasion. (1 = very unlikely 3 = neither likely nor unlikely 5 = very likely)	1	2	3	4	5
8. Likelihood of repurchasing a MindWriter based on: (1 = very unlikely 3 = neither likely nor unlikely 5 = very likely)					
a. Service/repair experience	1	2	3	4	5
b. Product performance	1	2	3	4	5

Comments/Suggestions: _____

How may we contact you to follow up on any problems you have experienced?

Last Name

First Name

() _____
Phone

City

State Zip

Service Code

Overcoming Instrument Problems

Build rapport

Redesign question process

Explore alternatives

Use other methods

Pretest

Key Terms

- Administrative question
- Branched question
- Buffer question
- Checklist
- Classification question
- Dichotomous question
- Disguised question
- Double-barreled question
- Free-response question
- Interview schedule
- Leading question
- Multiple-choice question

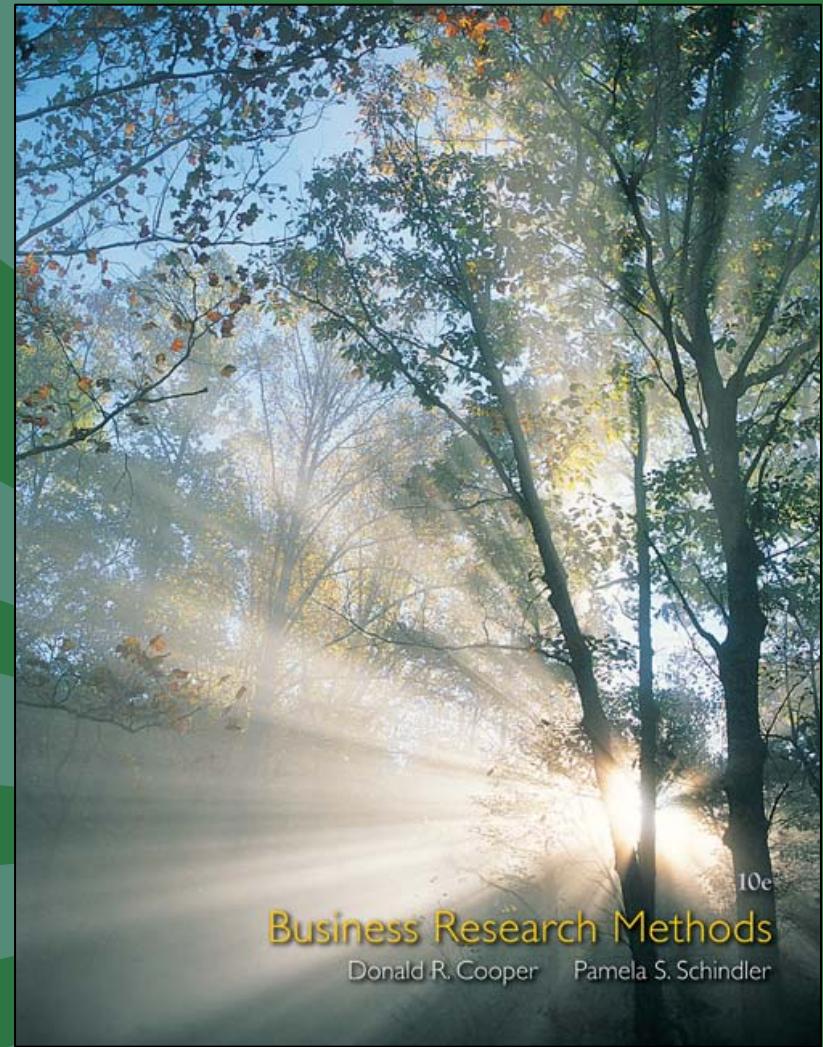
Key Terms

- Pretesting
- Primacy effect
- Ranking question
- Rating question
- Recency effort

- Screen question
- Structured response
- Target question
 - Structured
 - Unstructured
- Unstructured response

Chapter 14

Sampling





Learning Objectives

Understand . . .

- The two premises on which sampling theory is based.
- The accuracy and precision for measuring sample validity.
- The five questions that must be answered to develop a sampling plan.

Learning Objectives

Understand . . .

- The two categories of sampling techniques and the variety of sampling techniques within each category.
- The various sampling techniques and when each is used.

PulsePoint: Research Revelation

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The percent of U.S. restaurant workers who work under 100% smoke-free workplace policies.

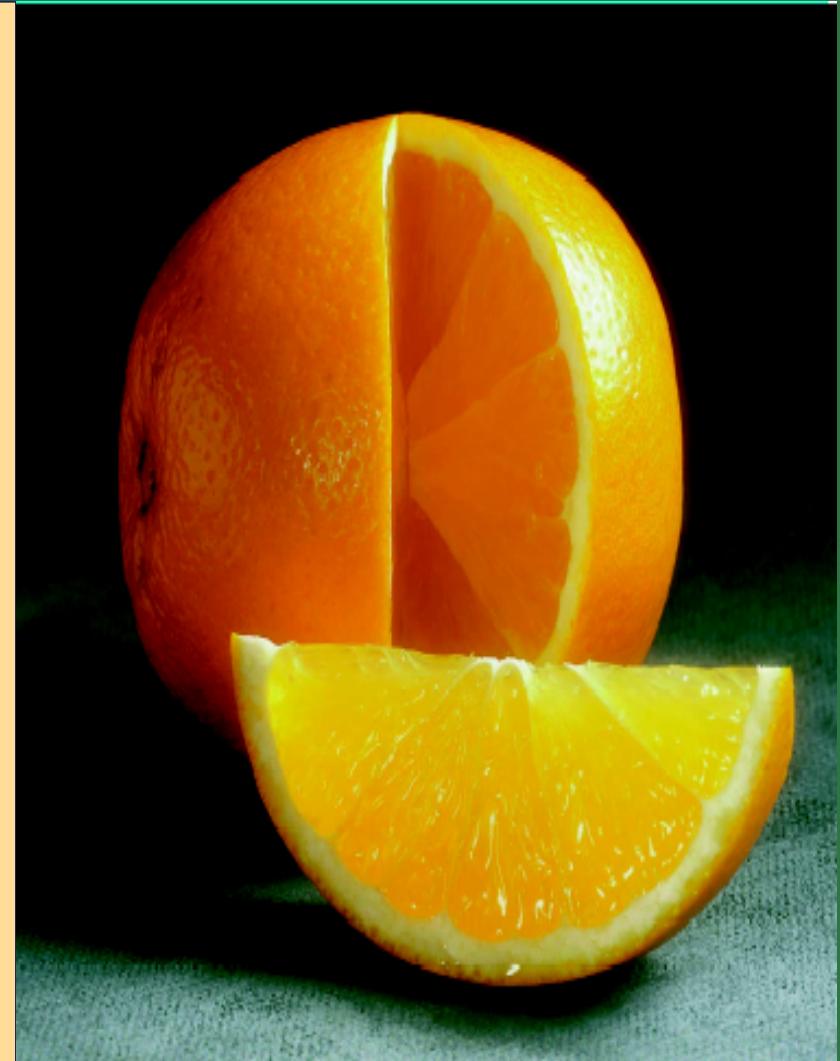
What Is a Sufficiently Large Sample?

“In recent Gallup ‘Poll on polls,’ . . . When asked about the scientific sampling foundation on which polls are based . . . most said that a survey of 1,500 – 2,000 respondents—a larger than average sample size for national polls—cannot represent the views of all Americans.”

*Frank Newport, The Gallup Poll editor in chief,
The Gallup Organization*

The Nature of Sampling

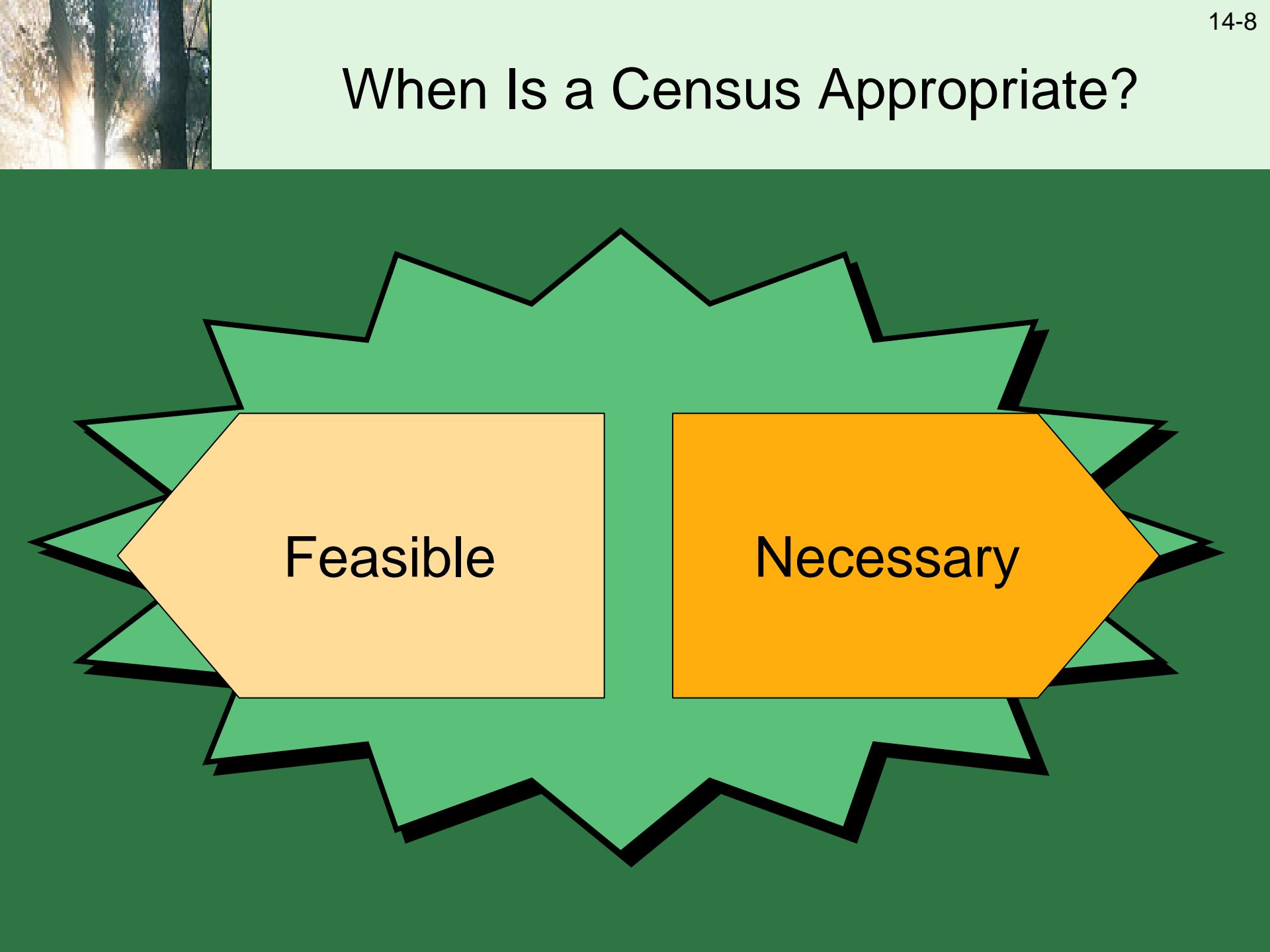
- Sampling
- Population Element
- Population
- Census
- Sampling frame



Why Sample?



When Is a Census Appropriate?



Feasible

Necessary

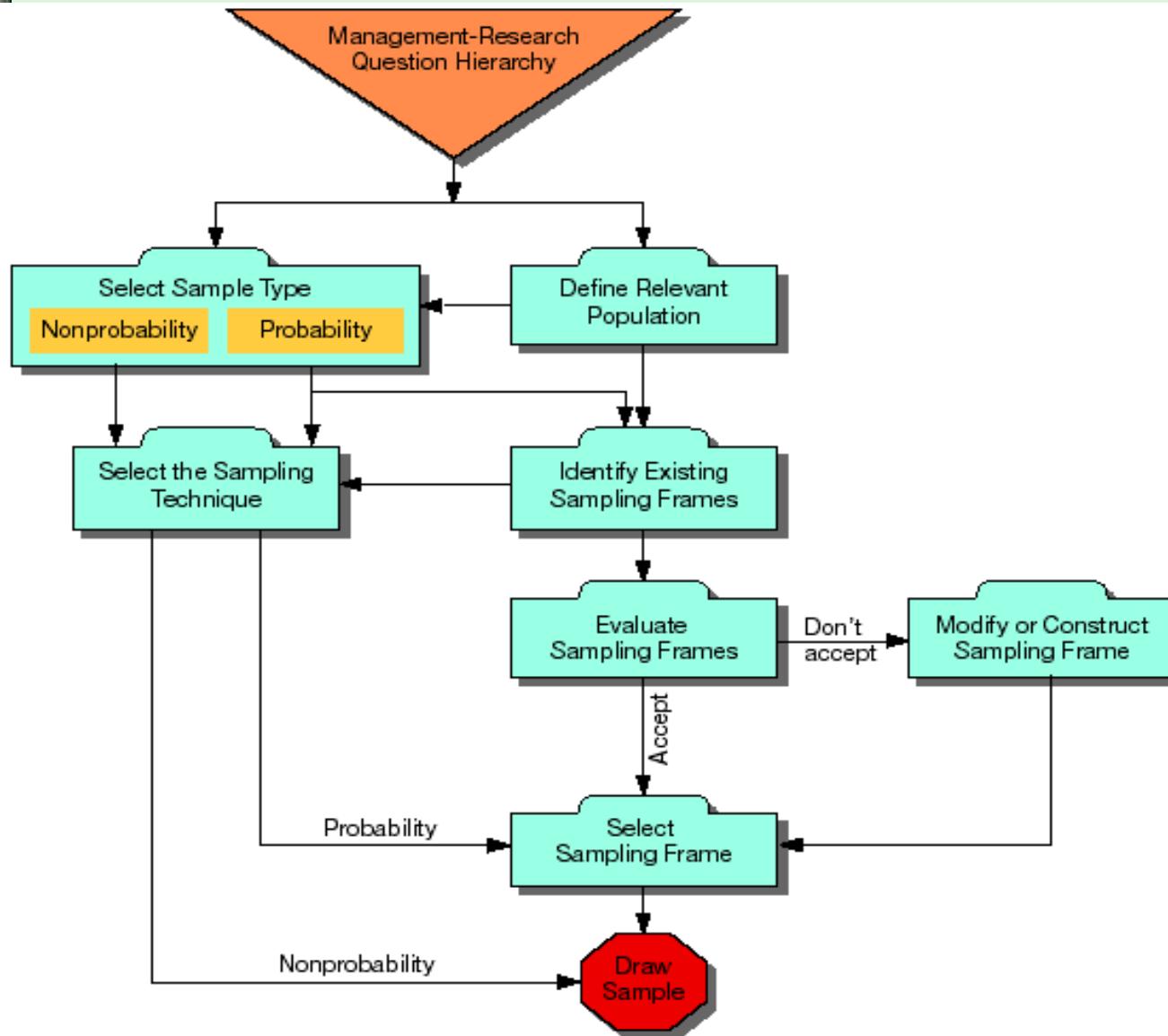
What Is a Valid Sample?

Accurate

Precise



Sampling Design within the Research Process



Types of Sampling Designs

Element Selection	Probability	Nonprobability
Unrestricted	Simple random	Convenience
Restricted	Complex random	Purposive
	Systematic	Judgment
	Cluster	Quota
	Stratified	Snowball
	Double	

Steps in Sampling Design



What is the target population?

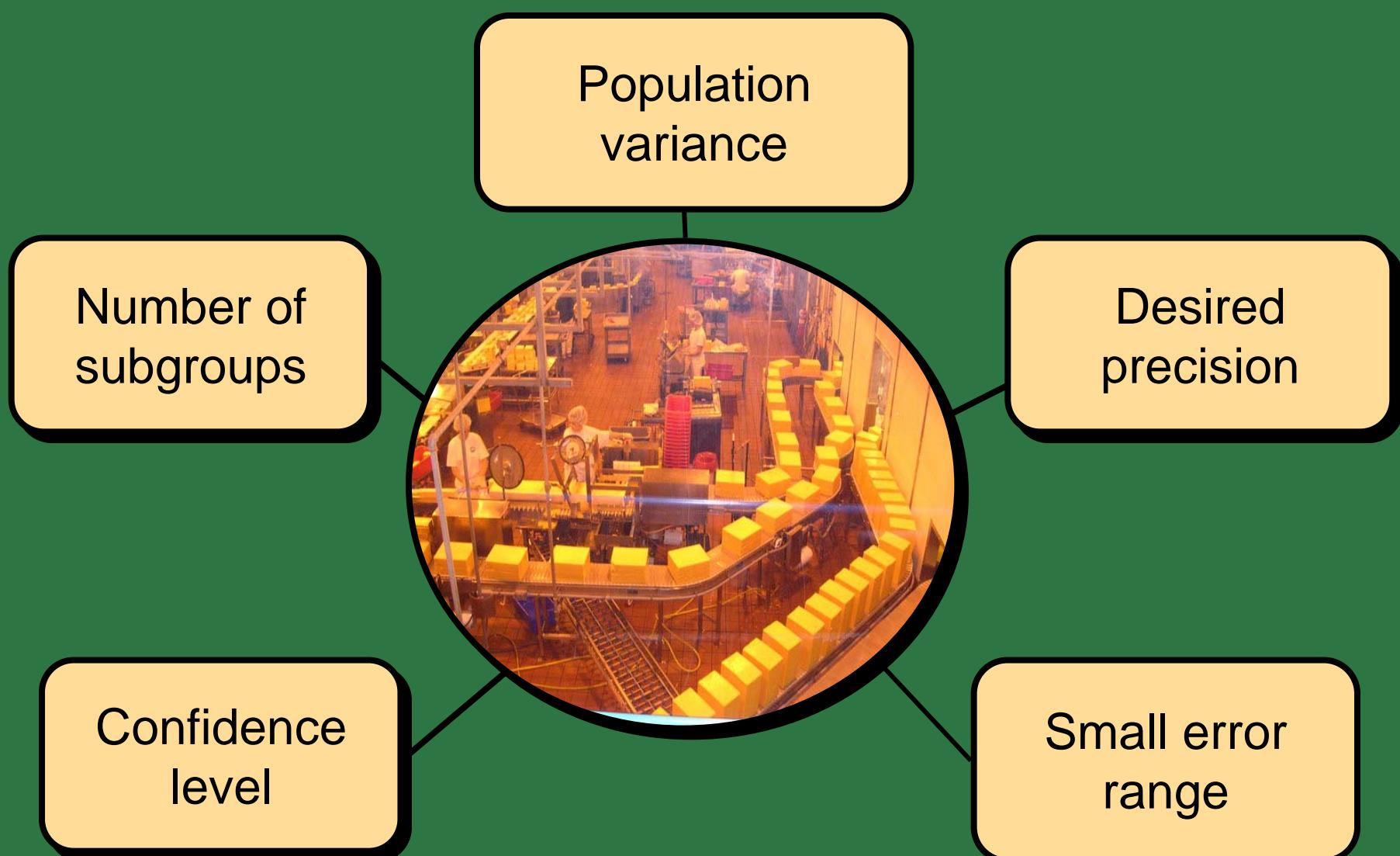
What are the parameters of interest?

What is the sampling frame?

What is the appropriate sampling method?

What size sample is needed?

When to Use Larger Sample Sizes?



Simple Random

Advantages

- Easy to implement with random dialing

Disadvantages

- Requires list of population elements
- Time consuming
- Uses larger sample sizes
- Produces larger errors
- High cost

Systematic

Advantages

- Simple to design
- Easier than simple random
- Easy to determine sampling distribution of mean or proportion

Disadvantages

- Periodicity within population may skew sample and results
- Trends in list may bias results
- Moderate cost

Stratified

Advantages

- Control of sample size in strata
- Increased statistical efficiency
- Provides data to represent and analyze subgroups
- Enables use of different methods in strata

Disadvantages

- Increased error will result if subgroups are selected at different rates
- Especially expensive if strata on population must be created
- High cost

Cluster

Advantages

- Provides an unbiased estimate of population parameters if properly done
- Economically more efficient than simple random
- Lowest cost per sample
- Easy to do without list

Disadvantages

- Often lower statistical efficiency due to subgroups being homogeneous rather than heterogeneous
- Moderate cost

Stratified and Cluster Sampling

Stratified

- Population divided into few subgroups
- Homogeneity within subgroups
- Heterogeneity between subgroups
- Choice of elements from within each subgroup

Cluster

- Population divided into many subgroups
- Heterogeneity within subgroups
- Homogeneity between subgroups
- Random choice of subgroups

Area Sampling



Double Sampling

Advantages

- May reduce costs if first stage results in enough data to stratify or cluster the population

Disadvantages

- Increased costs if discriminately used

Nonprobability Samples



Nonprobability Sampling Methods

Convenience

Judgment

Quota

Snowball



Key Terms

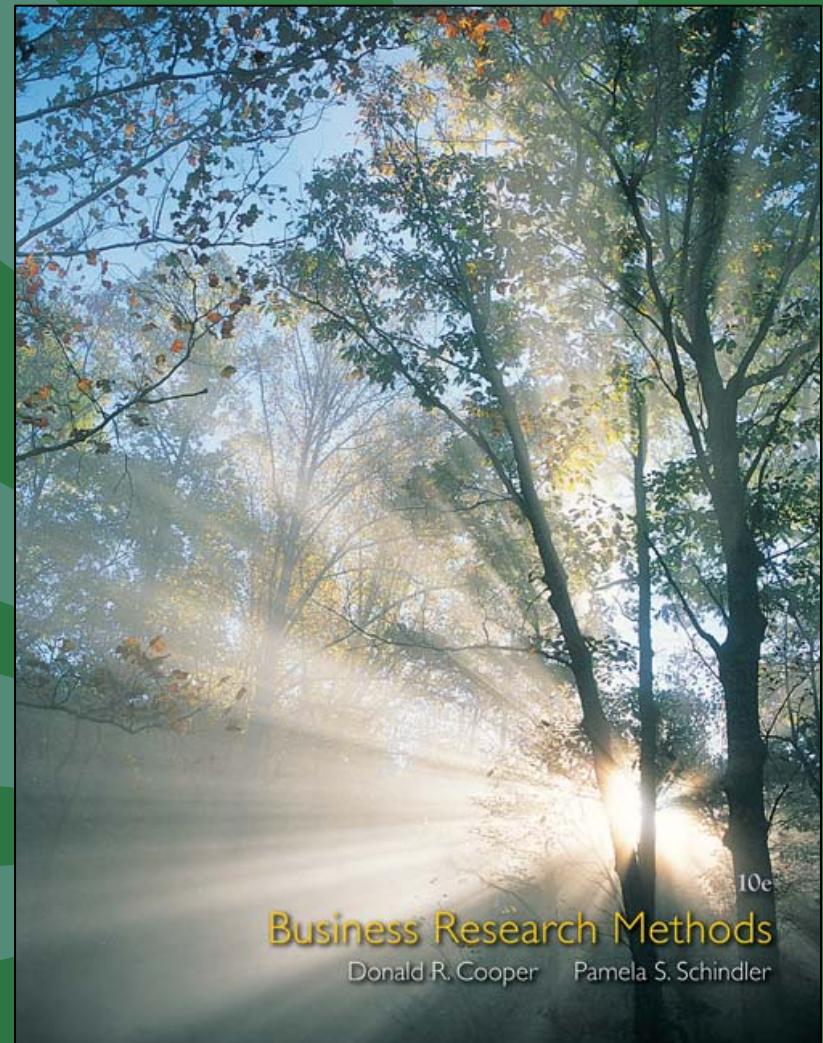
- Area sampling
- Census
- Cluster sampling
- Convenience sampling
- Disproportionate stratified sampling
- Double sampling
- Judgment sampling
- Multiphase sampling
- Nonprobability sampling
- Population
- Population element
- Population parameters
- Population proportion of incidence
- Probability sampling

Key Terms

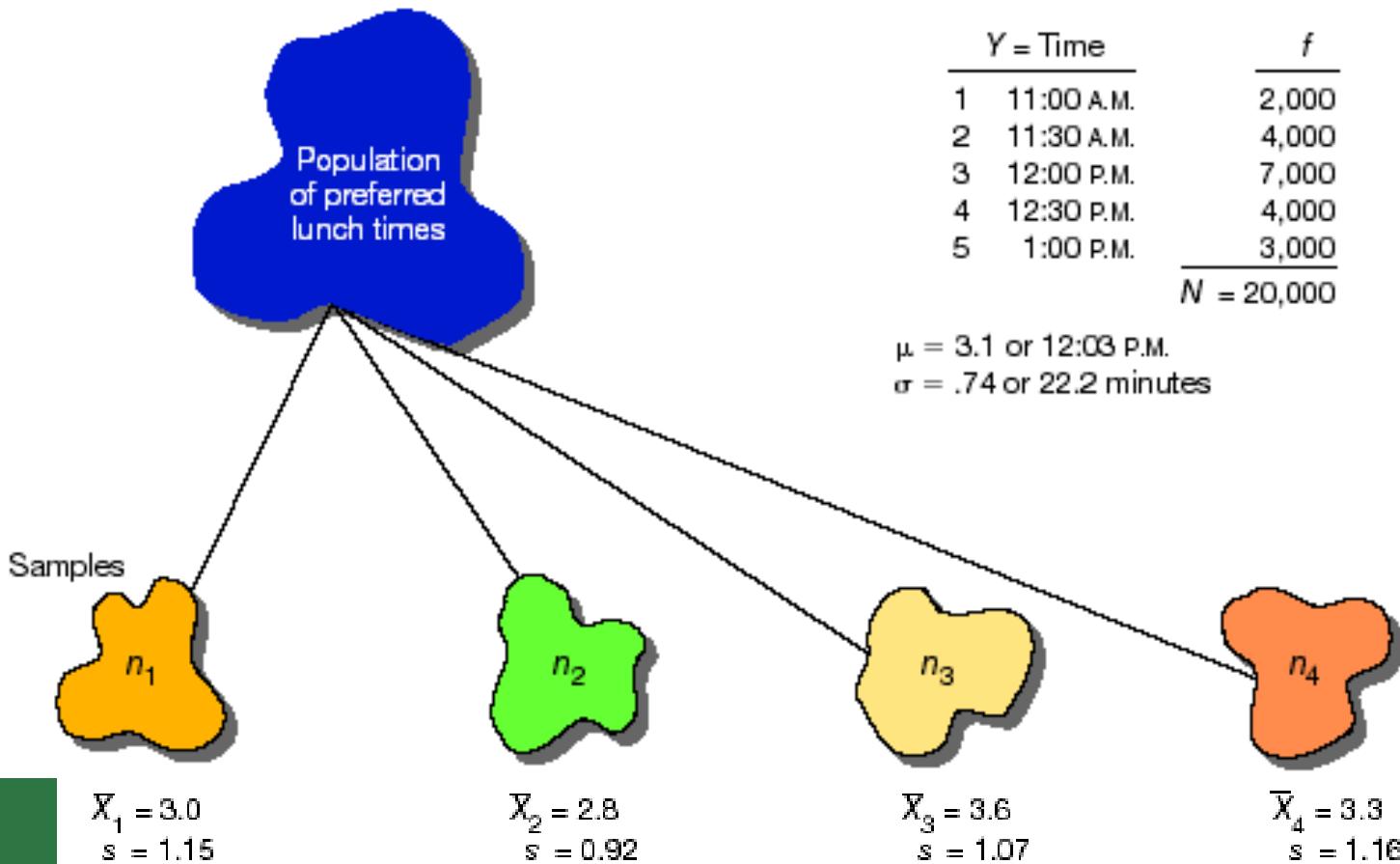
- Proportionate stratified sampling
- Quota sampling
- Sample statistics
- Sampling
- Sampling error
- Sampling frame
- Sequential sampling
- Simple random sample
- Skip interval
- Snowball sampling
- Stratified random sampling
- Systematic sampling
- Systematic variance

Appendix 14a

Determining Sample Size



Random Samples



Increasing Precision

Reducing the Standard Deviation by 50%

$$\sigma_{\bar{x}} = \frac{s}{\sqrt{n}}$$

$$\sigma_{\bar{x}} = \frac{.74}{\sqrt{10}} = .234$$

$$\sigma_{\bar{x}} = \frac{.37}{\sqrt{10}} = .117$$

Quadrupling the Sample

$$\sigma_{\bar{x}} = \frac{.8}{\sqrt{25}} = .16$$

$$\sigma_{\bar{x}} = \frac{.8}{\sqrt{100}} = .08$$

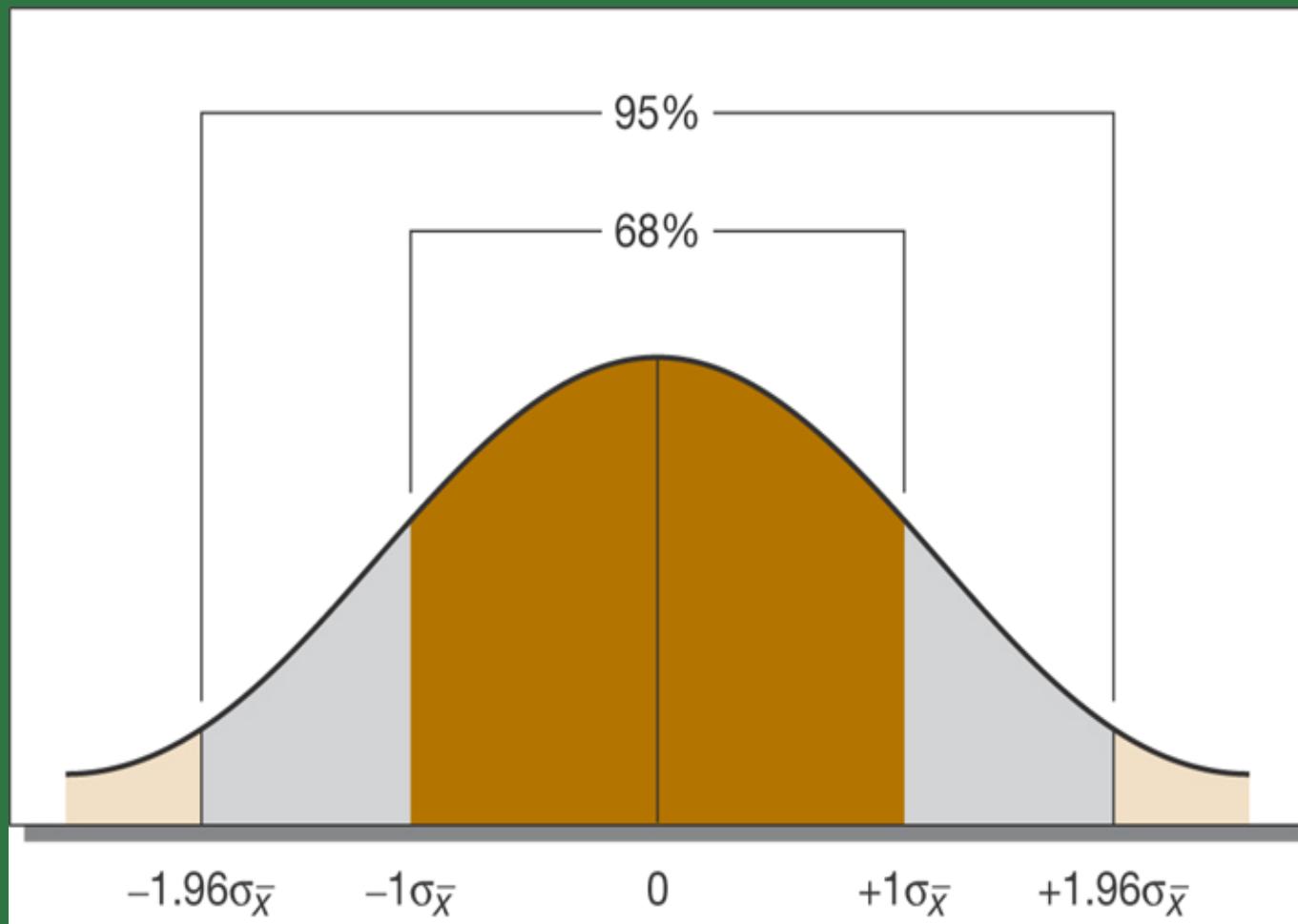
where

$\sigma_{\bar{x}}$ = standard error of the mean

s = standard deviation of the sample

n = sample size

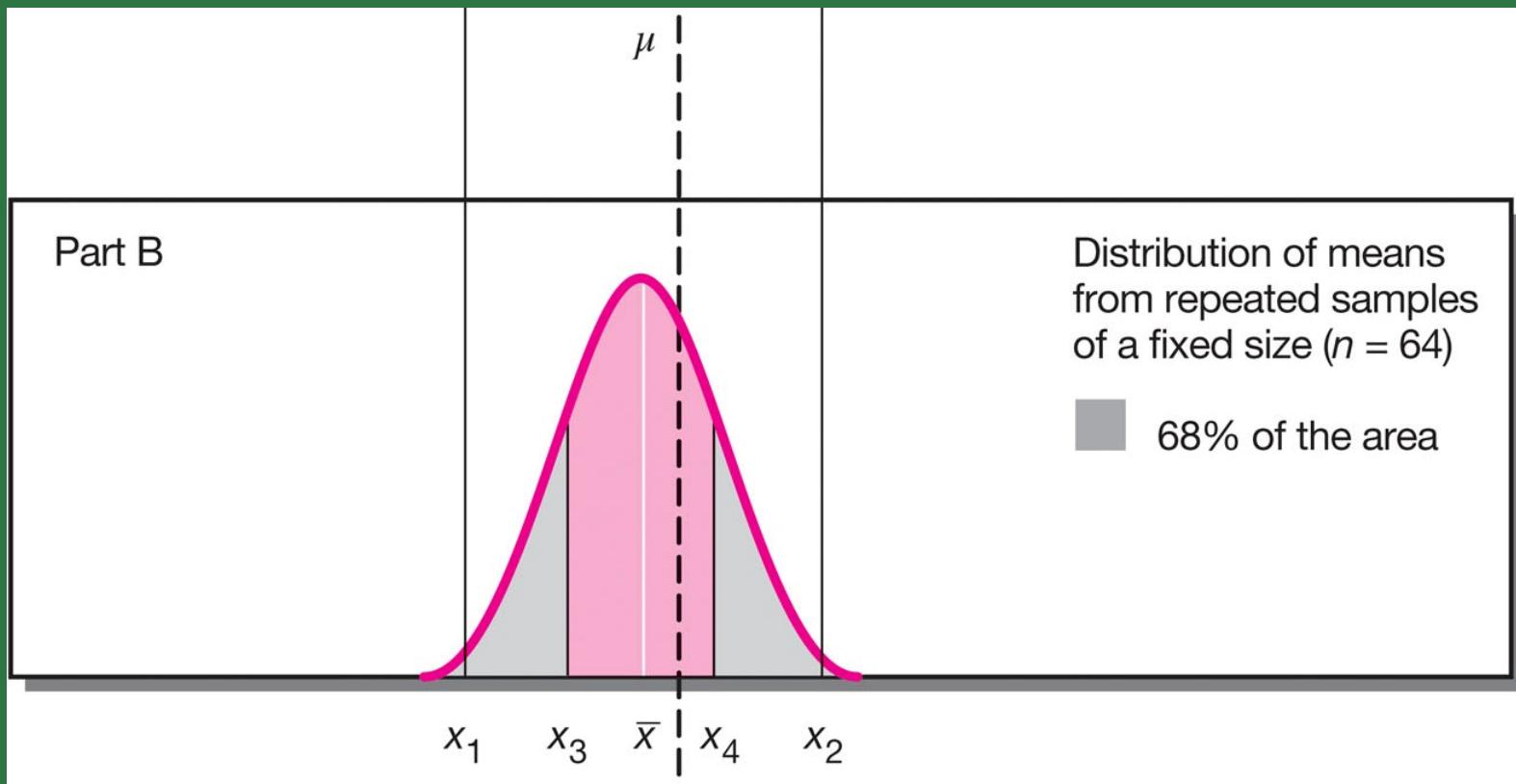
Confidence Levels & the Normal Curve



Standard Errors

Standard Error (Z score)	% of Area	Approximate Degree of Confidence
1.00	68.27	68%
1.65	90.10	90%
1.96	95.00	95%
3.00	99.73	99%

Central Limit Theorem



Estimates of Dining Visits

Confidence	Z score	% of Area	Interval Range (visits per month)
68%	1.00	68.27	9.48-10.52
90%	1.65	90.10	9.14-10.86
95%	1.96	95.00	8.98-11.02
99%	3.00	99.73	8.44-11.56

Calculating Sample Size for Questions involving Means



Precision

Confidence level

Size of interval estimate

Population Dispersion

Need for FPA

Metro U Sample Size for Means

Steps	Information
Desired confidence level	95% ($z = 1.96$)
Size of the interval estimate	$\pm .5$ meals per month
Expected range in population	0 to 30 meals
Sample mean	10
Standard deviation	4.1
Need for finite population adjustment	No
Standard error of the mean	$.5/1.96 = .255$
Sample size	$(4.1)^2/ (.255)^2 = 259$

Proxies of the Population Dispersion

- Previous research on the topic
- Pilot test or pretest
- Rule-of-thumb calculation
 - 1/6 of the range



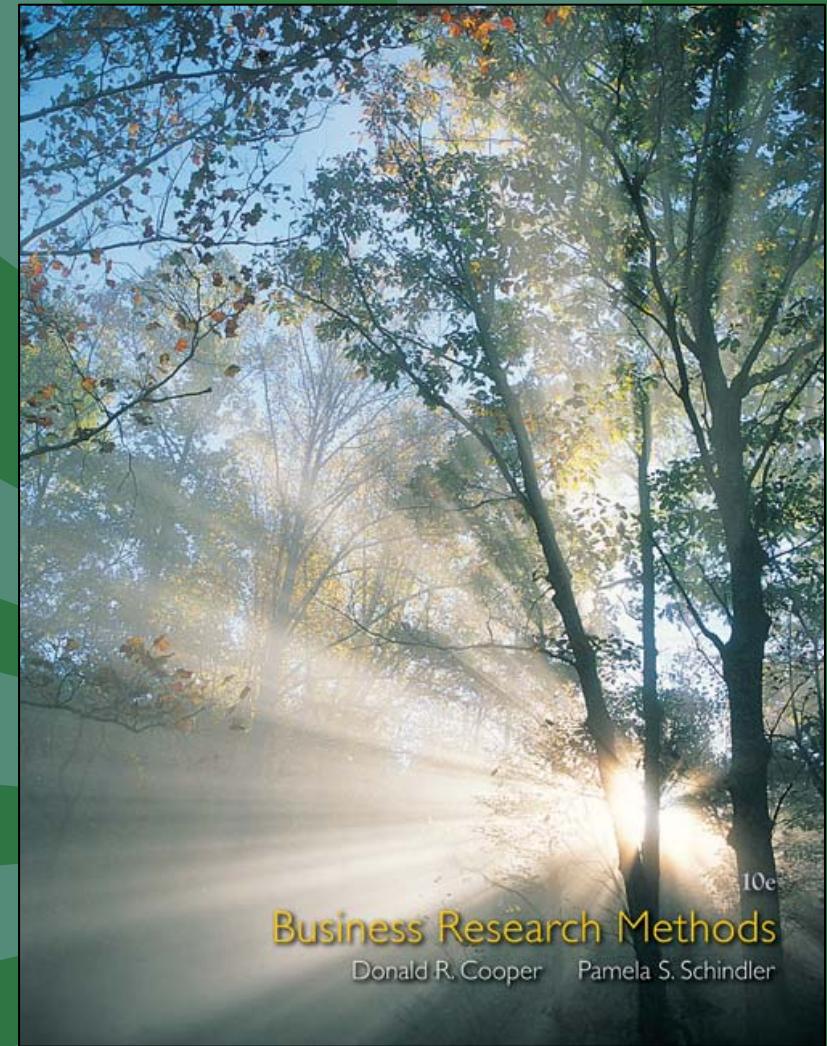
Metro U Sample Size for Proportions

Steps	Information
Desired confidence level	95% ($z = 1.96$)
Size of the interval estimate	$\pm .10$ (10%)
Expected range in population	0 to 100%
Sample proportion with given attribute	30%
Sample dispersion	$Pq = .30(1-.30) = .21$
Finite population adjustment	No
Standard error of the proportion	$.10/1.96 = .051$
Sample size	$.21/ (.051)^2 = 81$

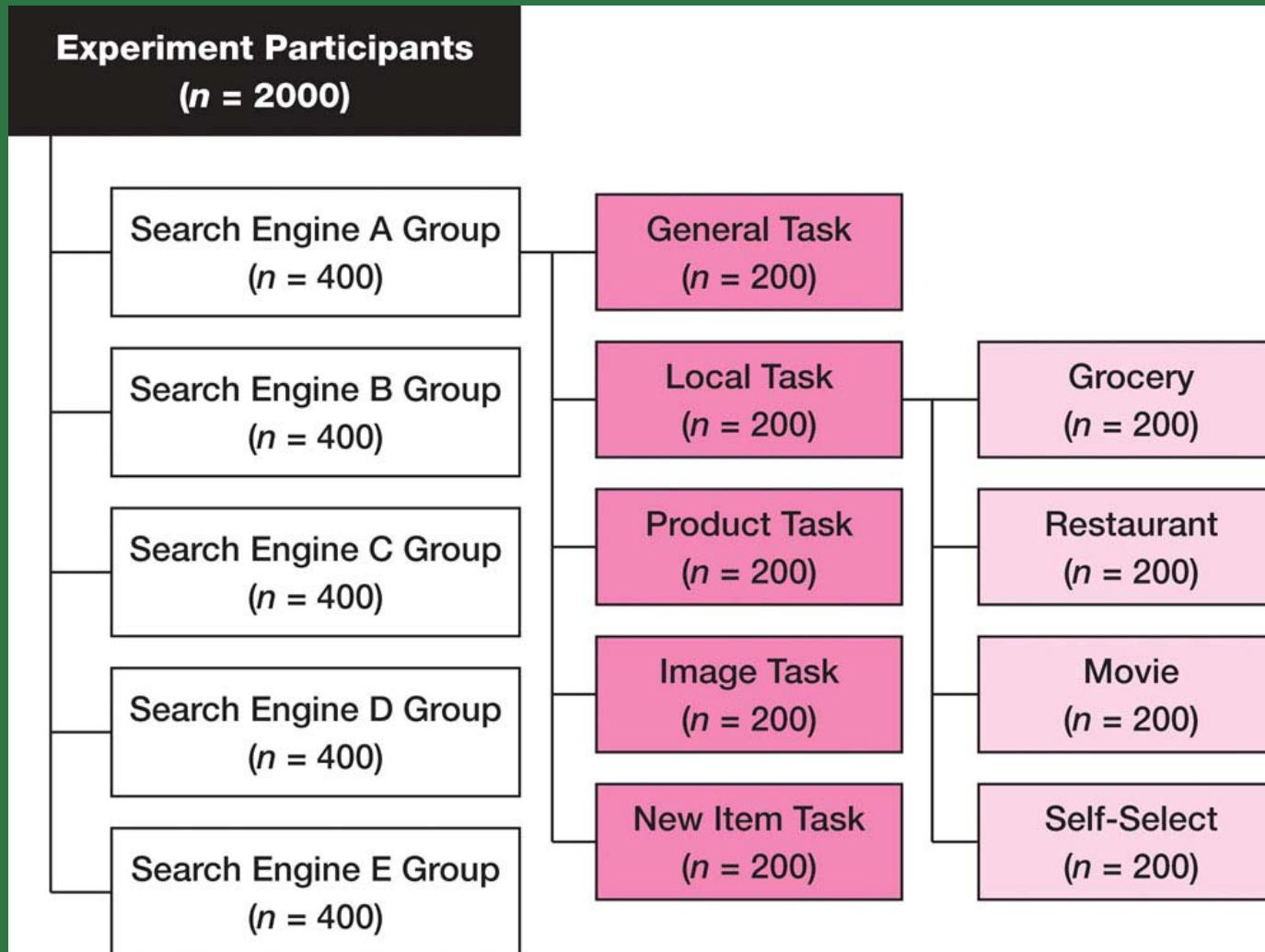
Appendix 15a: Key Terms

- Central limit theorem
- Confidence interval
- Confidence level
- Interval estimate
- Point estimate
- Proportion

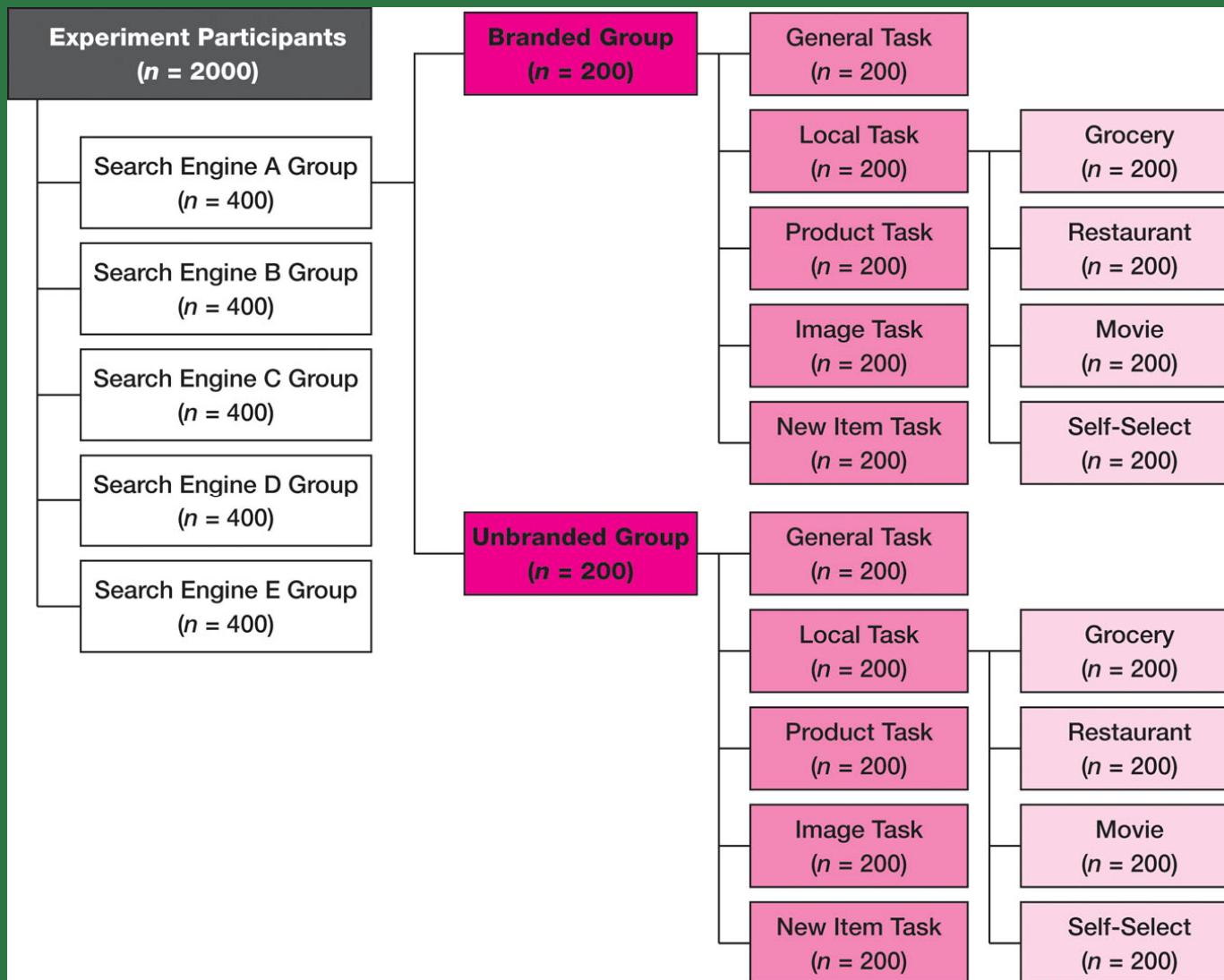
Addendum: Keynote CloseUp



Keynote Experiment

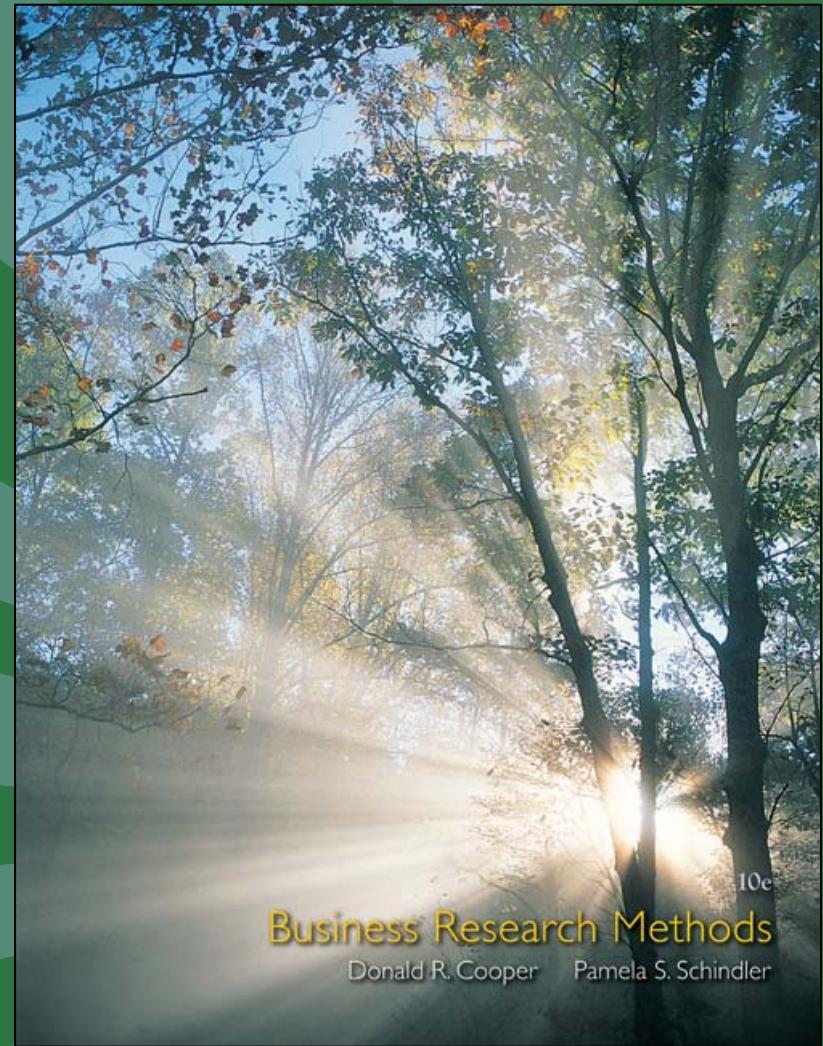


Keynote Experiment (cont.)



Chapter 15

Data Preparation and Description





Learning Objectives

Understand . . .

- The importance of editing the collected raw data to detect errors and omissions.
- How coding is used to assign number and other symbols to answers and to categorize responses.
- The use of content analysis to interpret and summarize open questions.



Learning Objectives

Understand . . .

- Problems with and solutions for “don’t know” responses and handling missing data.
- The options for data entry and manipulation.

PulsePoint: Research Revelation

68

The percent of online consumers who put trust in online consumer recommendations.

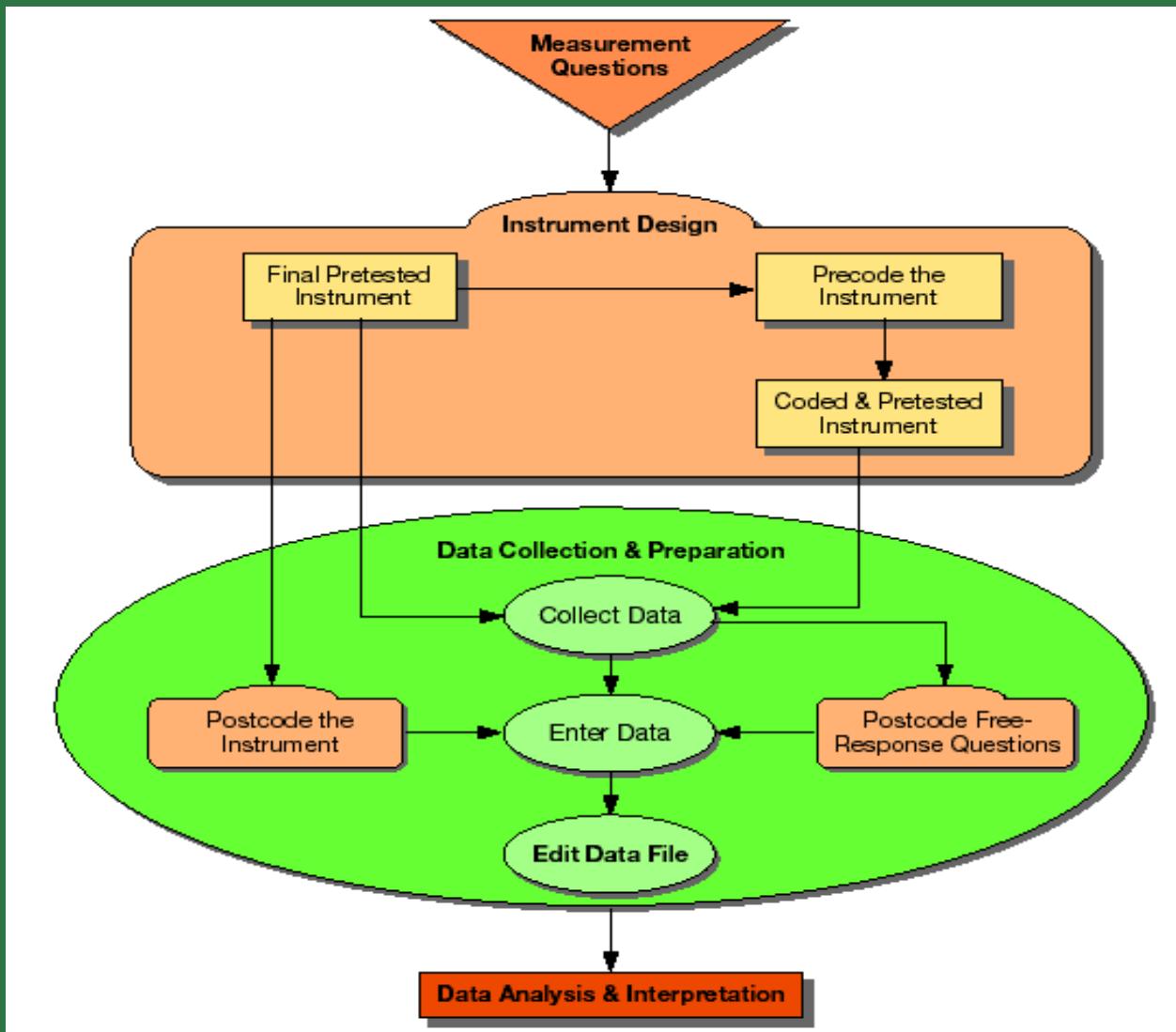


Research Adjusts for Imperfect Data

“In the future, we’ll stop moaning about the lack of perfect data and start using the good data with much more advanced analytics and data-matching techniques.”

*Kate Lynch, research director
Leo Burnett’s Starcom Media Unit*

Data Preparation in the Research Process



Monitoring Online Survey Data



Now let's talk about software support. If the software hiccups or takes an unscheduled break, the wrong questions can get answered. Only nonstop support can keep that from happening.

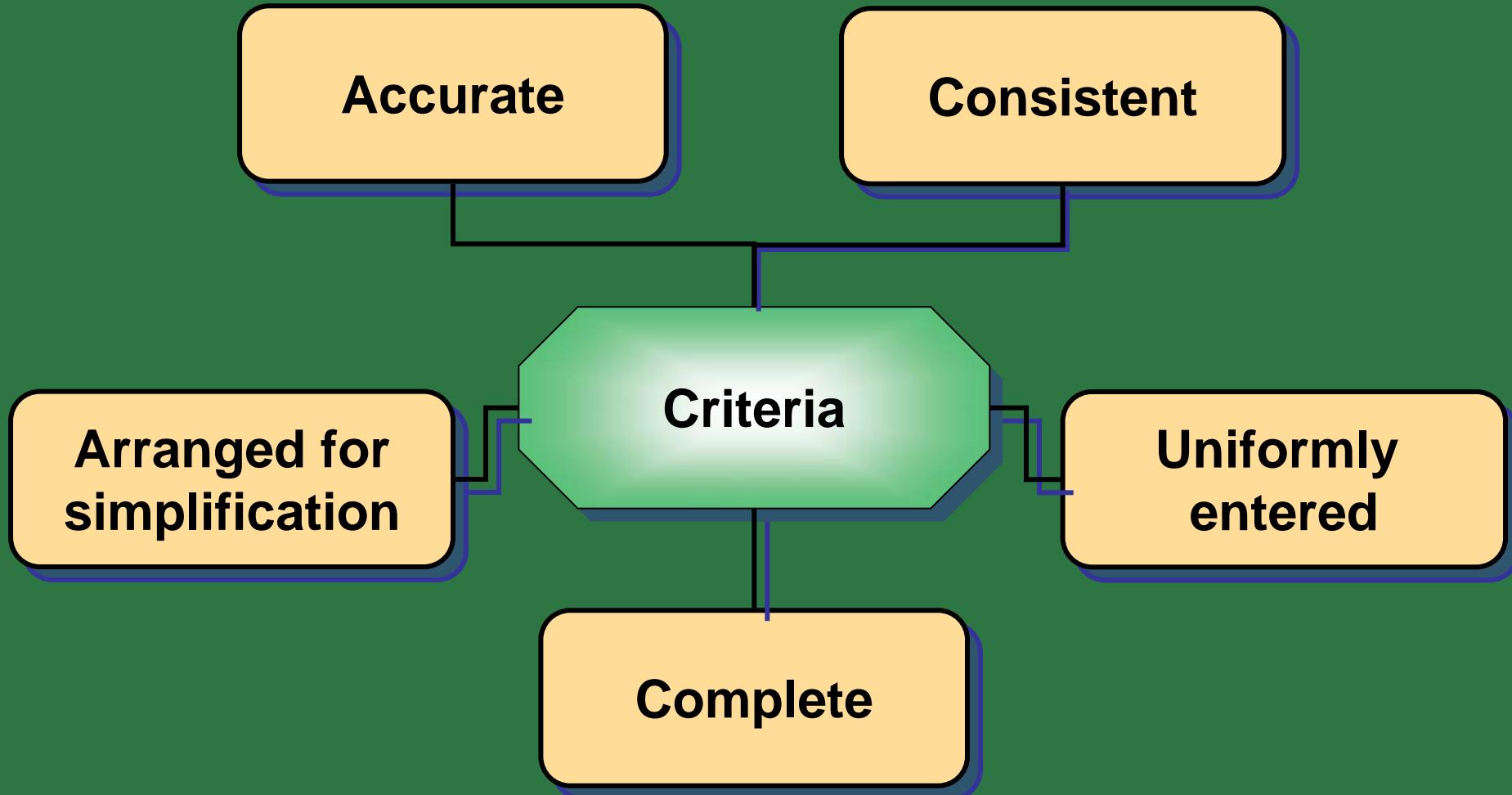
That's why the world's top research organizations rely on CfMC Research Software, the only nonstop in the business.

Online surveys need special editing attention. CfMC provides software and support to research suppliers to prevent interruptions from damaging data .



Nonstop Support

Editing



Field Editing

- Field editing review
- Entry gaps identified
- Callbacks made
- Validate results

Ad message: Speed without accuracy won't help the manager choose the right direction.

There was a time when you were quick
but your manager wasn't.

For us, times haven't changed.

You've made the gains to get customers fast, but you can't afford to compromise on the sake of accuracy. After all, being quick on the draw doesn't always good if you miss the mark.

With Online Web Surveys, we've got the tools to make sure you're on the right track. With knowledgeable project managers and capable web programmers, we know how to roll up our sleeves and get the job done right ... right now.

Our robust survey engine also utilizes the latest in graphics, audio, video, flash and software to deliver rich survey environments that trigger respondent interest while giving you valuable survey feedback.

All this combined with powerful web-based reporting can only mean one thing. When it comes to turned online results, there's a new sheriff in town.

Visit us at www.westernmats.com for a demonstration and call us to learn how we can make with your next research project.

(800) 373-7739

Western Mats
Western Mats is a registered trademark of Western Mats, Inc.

Central Editing

Be familiar with instructions given to interviewers and coders

Do not destroy the original entry

Make all editing entries identifiable and in standardized form

Initial all answers changed or supplied

Place initials and date of editing on each instrument completed

Sample Codebook

Question	Variable Number	Code Description	Variable Name
_____	1	Record number	RENUM
_____	2	Respondent number	RESID
1	3	5 digit zip code 99999 = Missing	ZIP
2	4	2 digit birth year 99 = Missing	BIRTH
3	5	Gender 1 = Male 2 = Female 9 = Missing	GENDER
4	6	Marital status 1 = Married 2 = Widow(er) 3 = Divorced 4 = Separated 5 = Never married 9 = Missing	MARITAL
5	7	Own-Rent 1 = Own 2 = Rent 3 = Provided 9 = Missing	HOUSING

Precoding

1. What is the zip code of your residence? _____

2. What is the year of your birth? 19_____

3. Gender
(1) Male
(2) Female

Indicate
your choice → _____
by number

4. What is your marital status?

- (1) Married
- (2) Widow(er)
- (3) Divorced
- (4) Separated
- (5) Never married

Indicate
your choice → _____
by number

5. Do you own or rent your primary residence?

- (1) Own
- (2) Rent
- (3) Living quarters provided

Indicate
your choice → _____
by number

Coding Open-Ended Questions

6. What prompted you to purchase your most recent life insurance policy?

6

Reason for purchase

1 = Mentioned

0 = Not mentioned

8	Bought home	HOME
9	Birth of child	BIRTHCHD
10	Death of relative or friend	DEATH
11	Promoted	PROMO
12	Changed job/career	CHGJOB
13	Paid college expenses	COLLEXP
14	Acquired assets	ASSETS
15	Retired	RETIRED
16	Changed marital status	CHGMAR
17	Started business	STARTBUS
18	Expanded business	EXPBUS
19	Parent's influence	PARENT
20	Contacted by agent	AGENT
21	Other	OTHER

Coding Rules

Exhaustive

Appropriate to the
research problem

**Categories
should be**

Mutually exclusive

Derived from one
classification principle

Content Analysis

User-friendly interface with intuitive navigational system

Mark up transcripts as you analyze

Create your own Analysis Frameworks with different heading levels

Simultaneously view and record articulations, verbatims, and interpretations

QSR's Xsight software for content analysis.

Content Analysis

Mobile Phone Marketing Project - XSight

File Edit View Go Project Format Tools Window Help

New View Commentaries

Documents

- 01 Project Brief
- 02 Discussion Guide
- Group 1 Females**
- Group 2 Males
- Group 3 Males
- Group 4 Males
- Group 5 Females
- Group 6 Females
- Report on Precision
- Self Completion Responses

Analysis Frameworks

Documents

Maps

Queries

Reports / Presentations

Respondents

Sample Characteristics

Sub Samples

Tags

Initial - Core Values of Fone

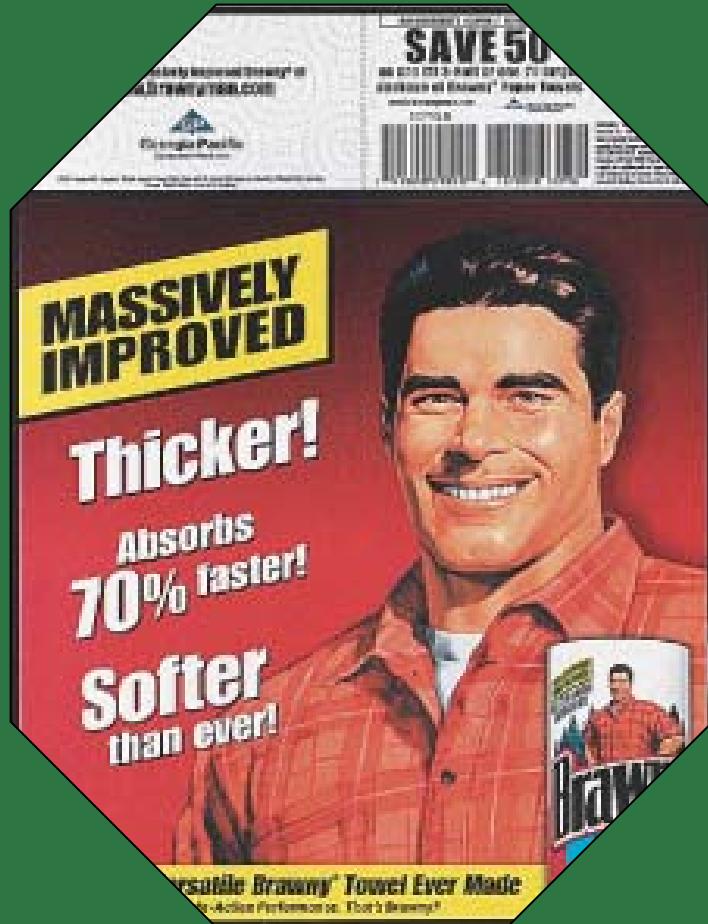
```
graph LR; A[the adverts] --> Marketing[Marketing]; B[special offers] --> Marketing; C[expensive] --> Marketing; Marketing --> Fone[Fone]; Fone --> D[Features]; Fone --> E[Image]; Fone --> G[The Look]; Fone --> H[Performance]; G --> I[good looking]; G --> J[colours]
```

Group 1 Females

What is the thing you love most about your mobile phone and what is the thing that irritates you most in general?

- The price of the phone calls is very irritating.
- The price of everything to do with them, it is a money making scheme, every little added extra costs extra, so that is my major irritation.
- Also that people can get hold of you 24 hours a day, it sometimes irritates me.
- But SMS's are good.
- But good and bad, because people can get hold of you all the time, but then there is also no excuse on their part if they don't get hold of you.
- Yes, so its good that you know they can't lie to you, because if they phone and you are unavailable then they can leave a message.
- Yes.

Types of Content Analysis



Syntactical

Referential

Propositional

Thematic

Open-Question Coding

Locus of Responsibility	Mentioned	Not Mentioned
A. Company	_____	_____
B. Customer	_____	_____
C. Joint Company-Customer	_____	_____
F. Other	_____	_____

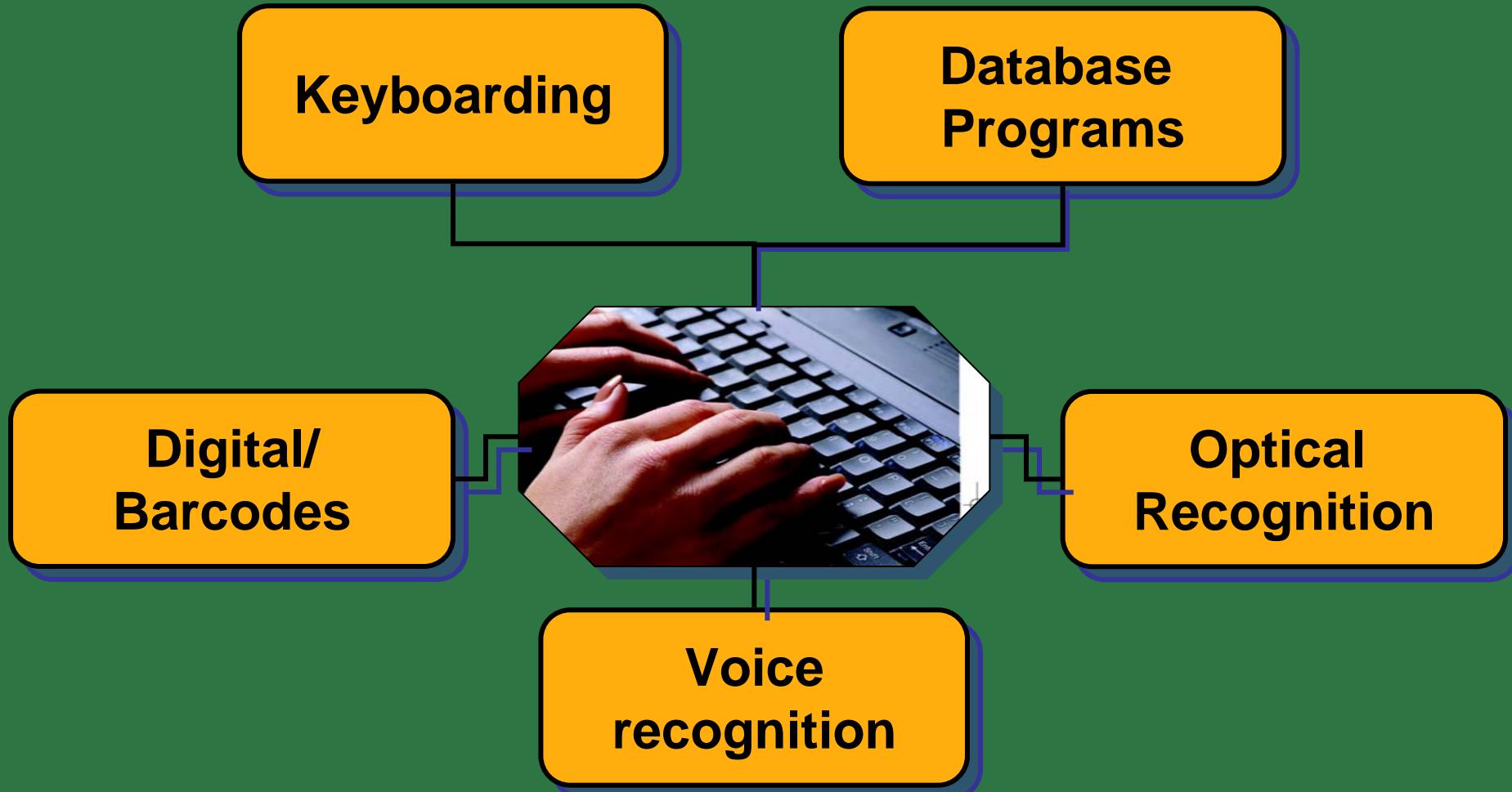
Locus of Responsibility	Frequency (n = 100)
A. Management	
1. Sales manager	10
2. Sales process	20
3. Other	7
4. No action area identified	3
B. Management	
1. Training	15
C. Customer	
1. Buying processes	12
2. Other	8
3. No action area identified	5
D. Environmental conditions	
E. Technology	20
F. Other	

Handling “Don’t Know” Responses

Question: Do you have a productive relationship with your present salesperson?

Years of Purchasing	Yes	No	Don’t Know
Less than 1 year	10%	40%	38%
1 – 3 years	30	30	32
4 years or more	60	30	30
Total	100% <i>n</i> = 650	100% <i>n</i> = 150	100% <i>n</i> = 200

Data Entry

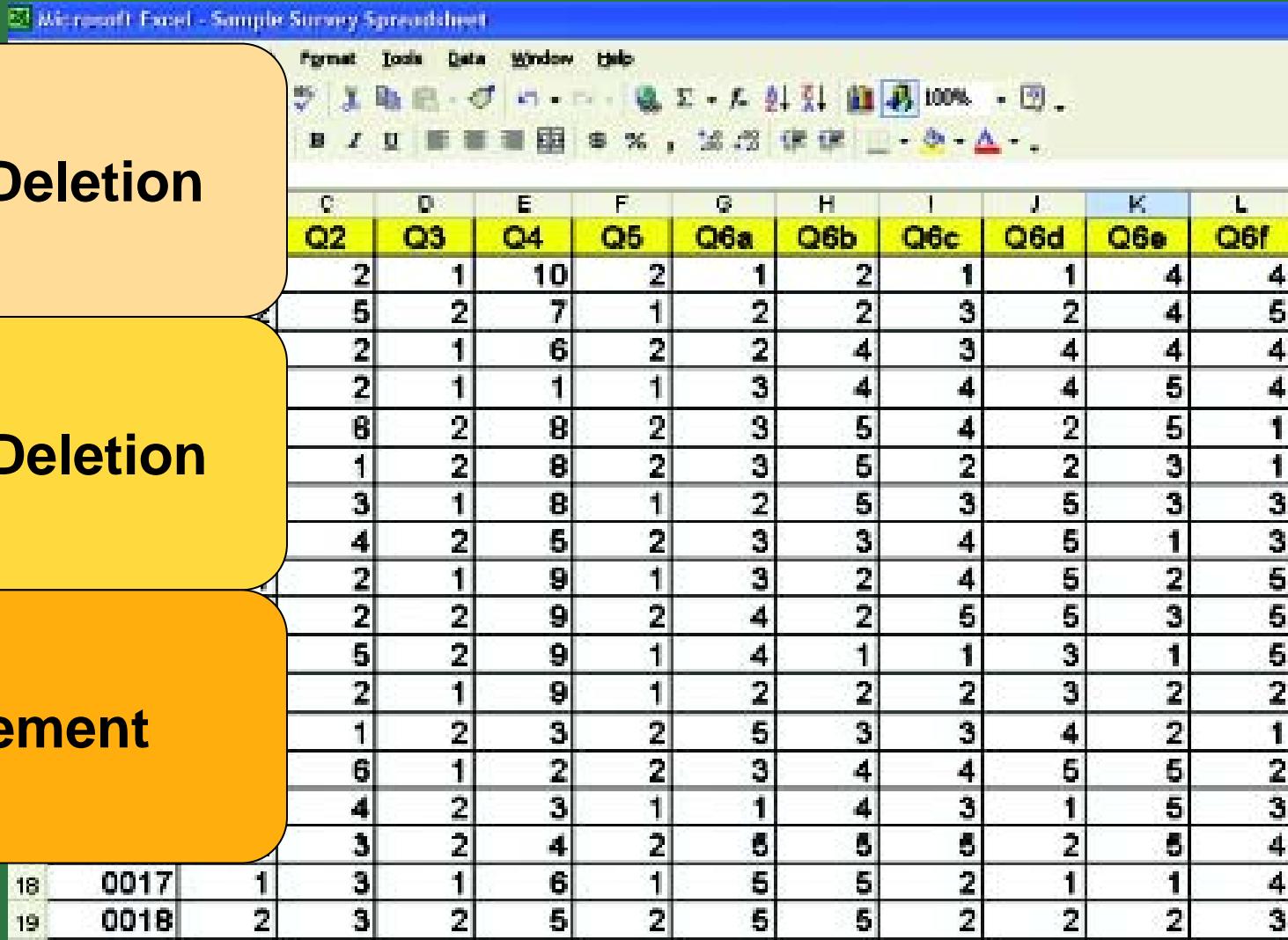


Missing Data

Listwise Deletion

Pairwise Deletion

Replacement



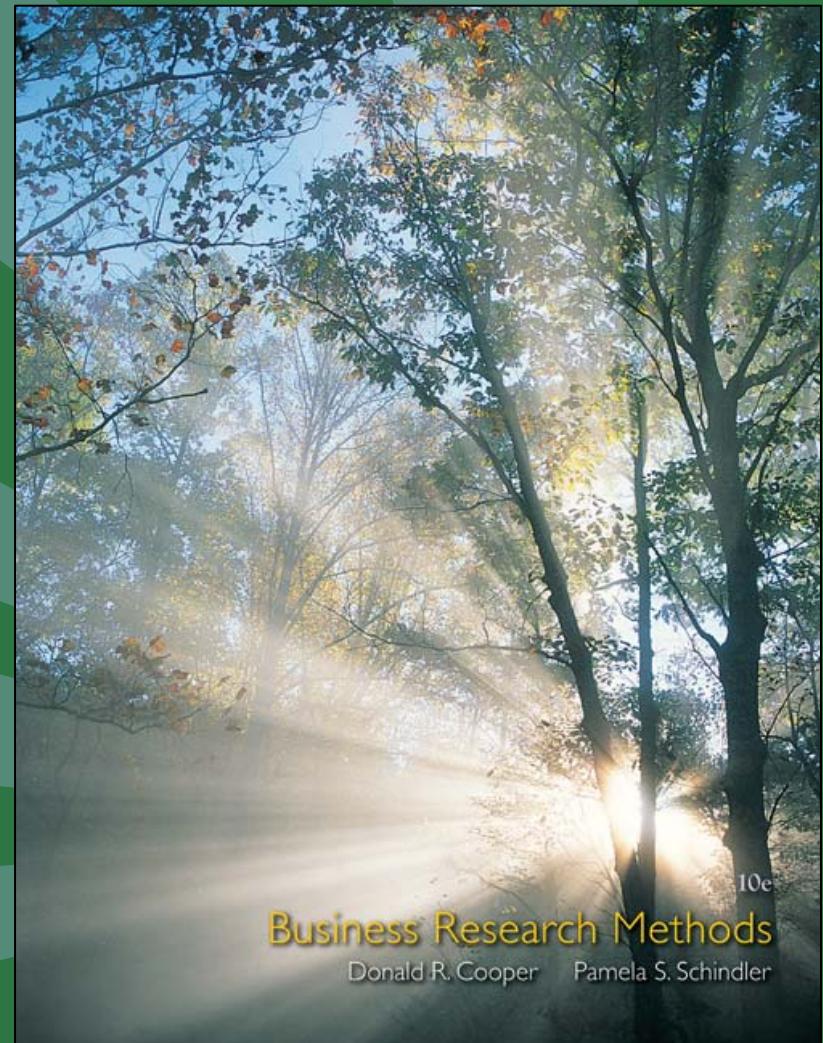
	C	D	E	F	G	H	I	J	K	L
	Q2	Q3	Q4	Q5	Q6a	Q6b	Q6c	Q6d	Q6e	Q6f
1	2	1	10	2	1	2	1	1	4	4
2	5	2	7	1	2	2	3	2	4	5
3	2	1	6	2	2	4	3	4	4	4
4	2	1	1	1	3	4	4	4	5	4
5	8	2	8	2	3	5	4	2	5	1
6	1	2	8	2	3	5	2	2	3	1
7	3	1	8	1	2	5	3	5	3	3
8	4	2	5	2	3	3	4	5	1	3
9	2	1	9	1	3	2	4	5	2	5
10	2	2	9	2	4	2	5	5	3	5
11	5	2	9	1	4	1	1	3	1	5
12	2	1	9	1	2	2	2	3	2	2
13	1	2	3	2	5	3	3	4	2	1
14	6	1	2	2	3	4	4	5	5	2
15	4	2	3	1	1	4	3	1	5	3
16	3	2	4	2	5	5	5	2	5	4
17	0017	1	3	1	6	1	5	2	1	1
18	0018	2	3	2	5	2	5	2	2	2

Key Terms

- Bar code
- Codebook
- Coding
- Content analysis
- Data entry
- Data field
- Data file
- Data preparation
- Data record
- Database
- Don't know response
- Editing
- Missing data
- Optical character recognition
- Optical mark recognition
- Precoding
- Spreadsheet
- Voice recognition

Appendix 15a

Describing Data Statistically



Frequencies

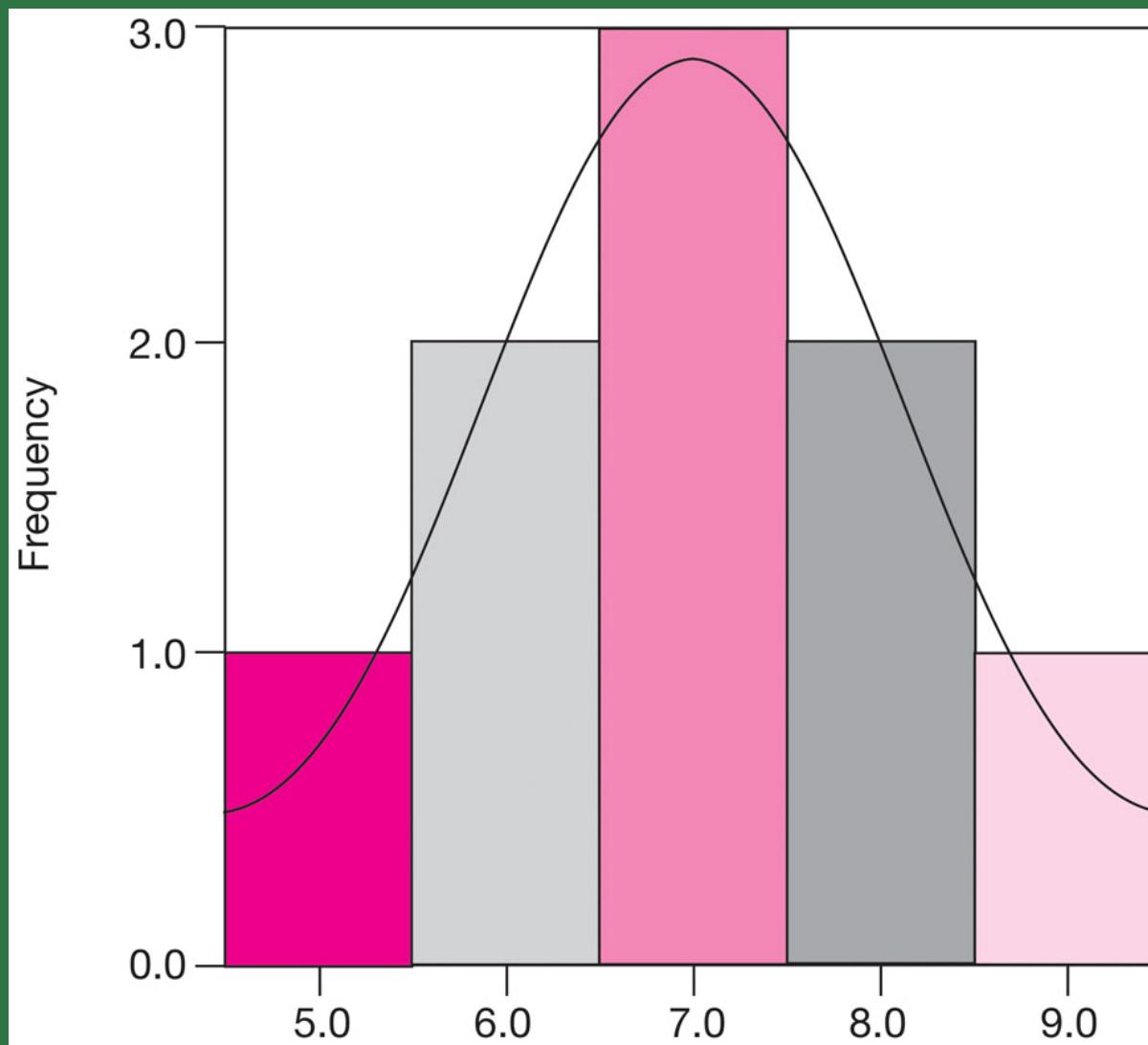
A

Unit Sales Increase (%)	Frequency	Percentage	Cumulative Percentage
5	1	11.1	11.1
6	2	22.2	33.3
7	3	33.3	66.7
8	2	22.2	88.9
9	1	11.1	100
Total	9	100.0	

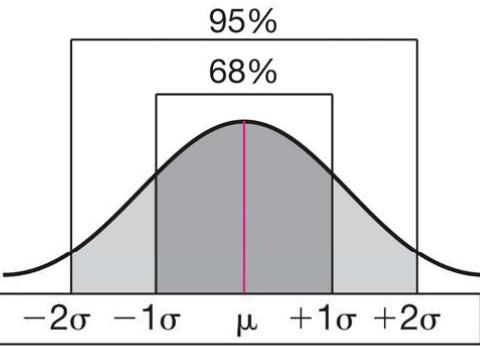
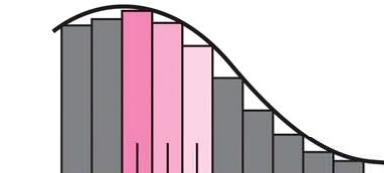
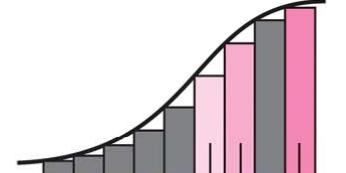
B

	Unit Sales Increase (%)	Frequency	Percentage	Cumulative Percentage
Origin, foreign (1)	6	1	11.1	11.1
	7	2	22.2	33.3
	8	2	22.2	55.5
Origin, foreign (2)	5	1	11.1	66.6
	6	1	11.1	77.7
	7	1	11.1	88.8
	9	1	11.1	100.0
	Total	9	100.0	

Distributions



Characteristics of Distributions

Shape: Skewness	Normal Symmetric	Positive or Right Skewed	Negative or Left Skewed
			
Spread	-2σ -1σ μ $+1\sigma$ $+2\sigma$		
Location	Mean Median Mode	Mode Median Mean	Mean Median Mode
	A	B	C



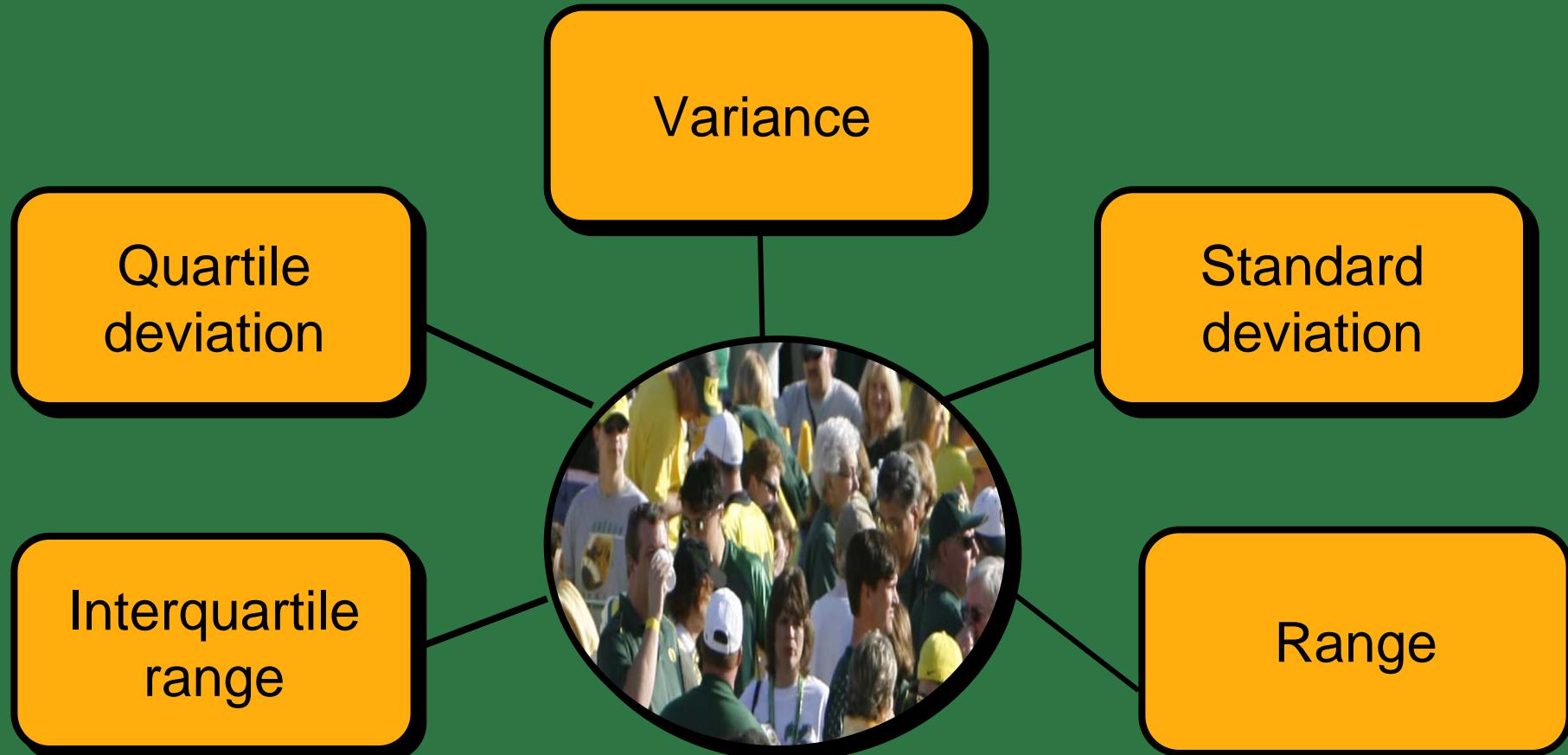
Measures of Central Tendency

Mean

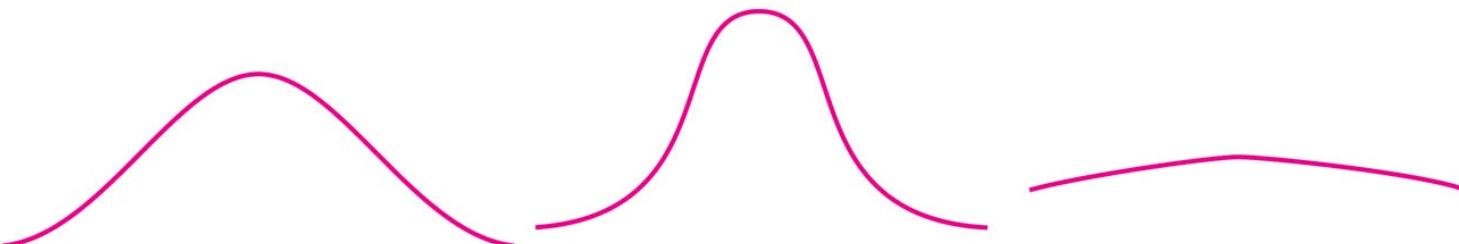
Median

Mode

Measures of Variability



Summarizing Distribution Shape

			
Shape: Kurtosis	Mesokurtic	Leptokurtic	Platykurtic
	D	E	F

Symbols

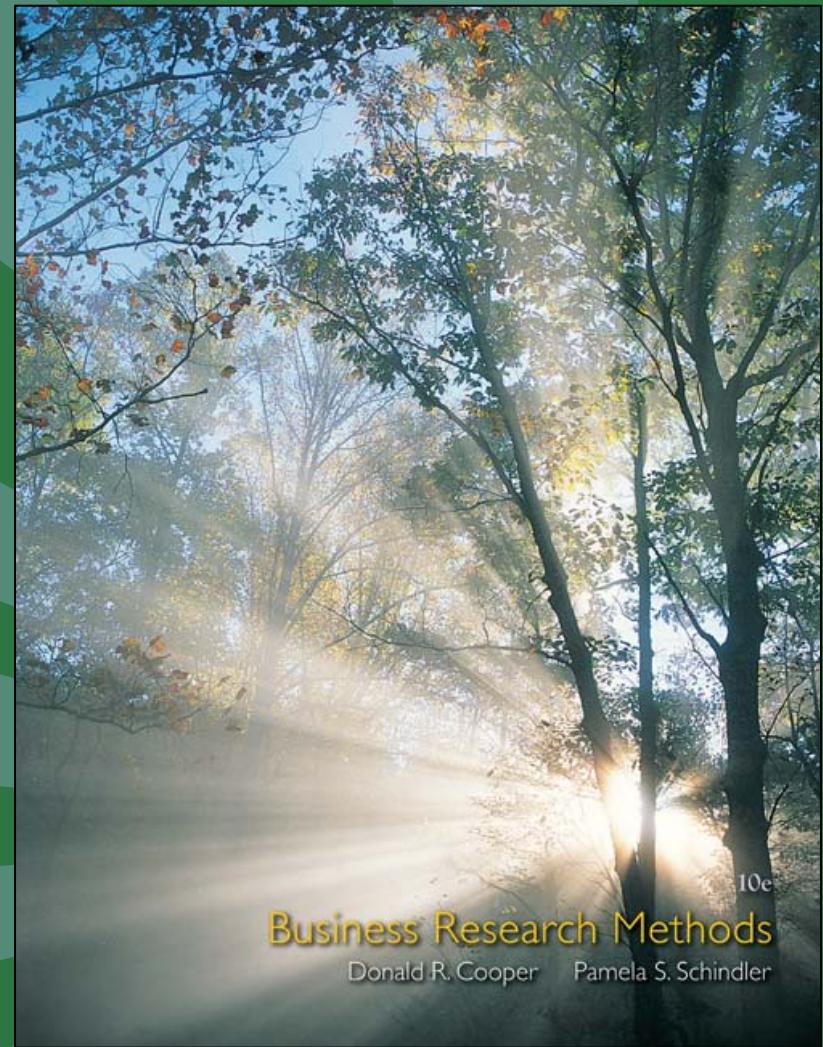
Variable	Population	Sample
Mean	μ	\bar{x}
Proportion	Π	p
Variance	σ^2	s^2
Standard deviation	σ	s
Size	N	n
Standard error of the mean	σ_x	S_x
Standard error of the proportion	σ_p	S_p

Key Terms

- Central tendency
- Descriptive statistics
- Deviation scores
- Frequency distribution
- Interquartile range (IQR)
- Kurtosis
- Median
- Mode
- Normal distribution
- Quartile deviation (Q)
- Skewness
- Standard deviation
- Standard normal distribution
- Standard score (Z score)
- Variability
- Variance

Chapter 16

Exploring, Displaying, and Examining Data



Learning Objectives

Understand . . .

- That exploratory data analysis techniques provide insights and data diagnostics by emphasizing visual representations of the data.
- How cross-tabulation is used to examine relationships involving categorical variables, serves as a framework for later statistical testing, and makes an efficient tool for data visualization and later decision-making.

PulsePoint: Research Revelation

67

The percent of college students who see nothing unethical about swapping or downloading digital copyrighted files (software, music, movies) without paying for them.



Research Values the Unexpected

“It is precisely because the unexpected jolts us out of our preconceived notions, our assumptions, our certainties, that it is such a fertile source of innovation.”

Peter Drucker, author
Innovation and Entrepreneurship

Researcher Skill Improves Data Discovery

It's not the clay.



It's the potter.

Pushing data into a template gets the job done. But delivering breakthrough marketing insights requires a special flair. DDW provides research on a global scale, yet is hands-on to shape and customize each research approach. Our top talent is involved at every step, offering unique research and marketing perspectives. The result? Solutions for success.

DDW

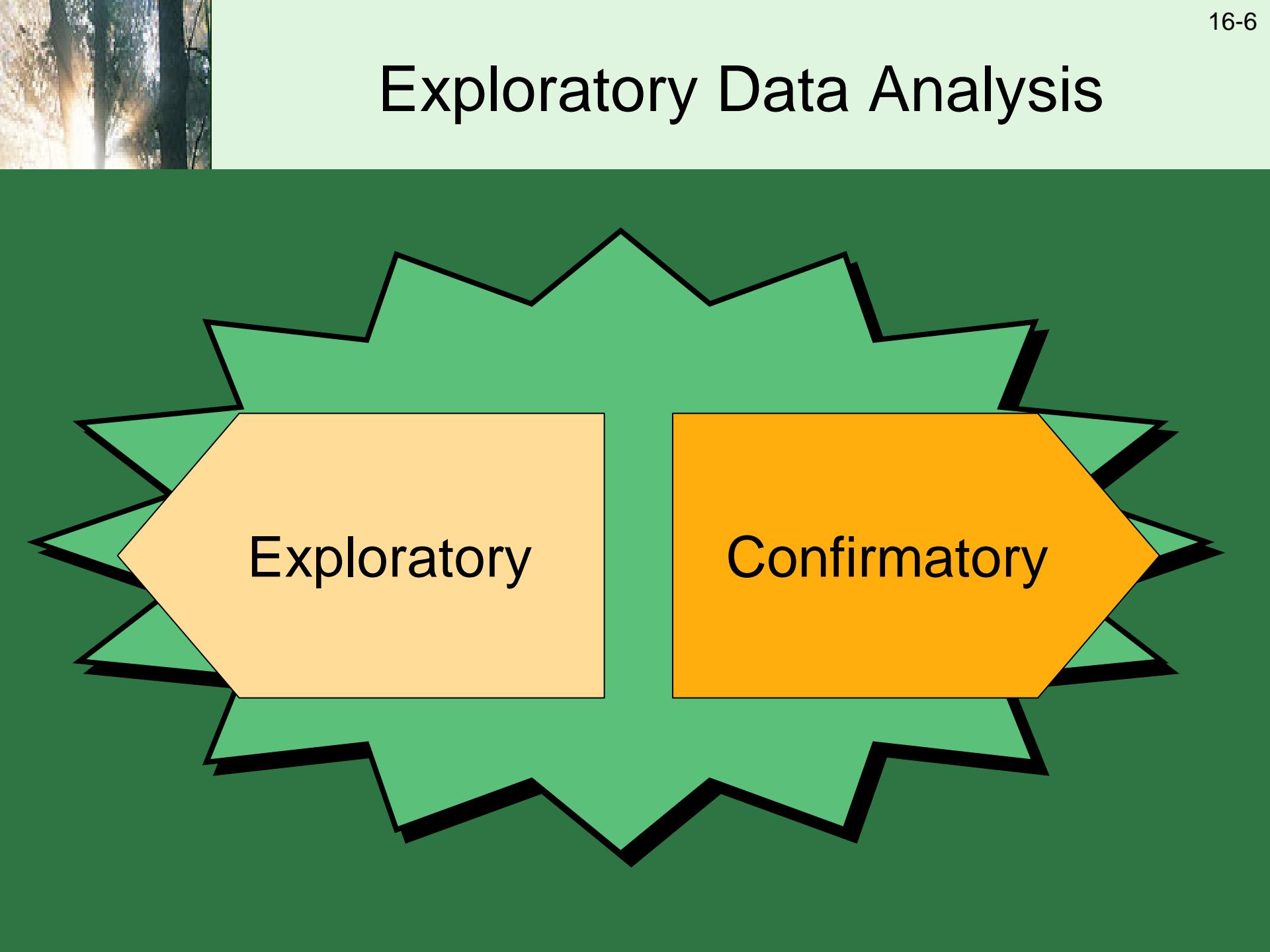
Data Development Worldwide

Know More. Is your online research feeling informed? DDW's Know More Internet Panel consists of over 6 million consumers, recruited and maintained with the highest standards. Call Managing Director Chip Lister at 212.633.1100 to discuss the differences we can make in your online research.

datadw.com New York Albany Orlando Chicago Kansas City San Francisco Long Beach

DDW is a global player in research services. As this ad proclaims, you can “push data into a template and get the job done,” but you are unlikely to make discoveries using that process.

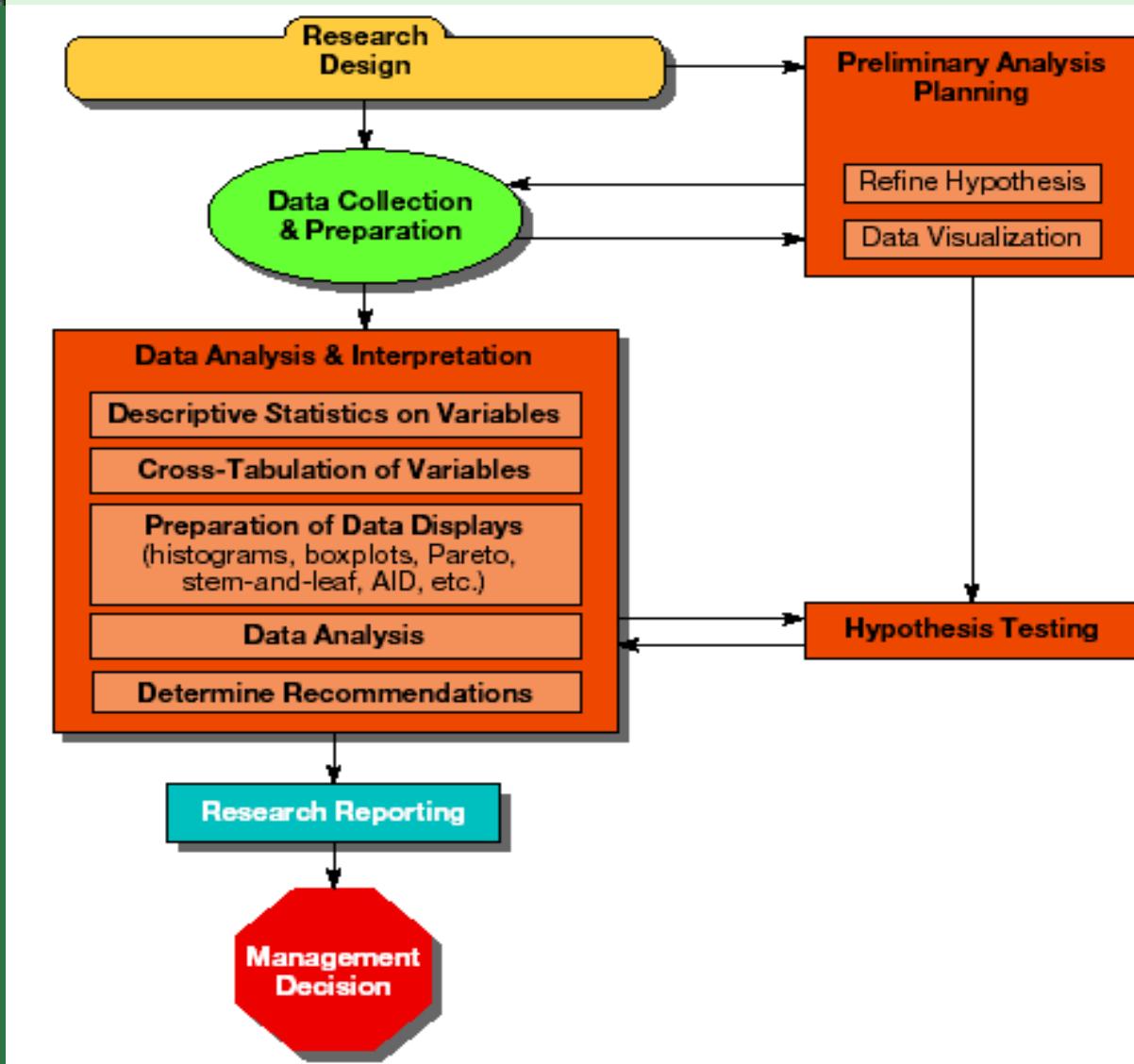
Exploratory Data Analysis



Exploratory

Confirmatory

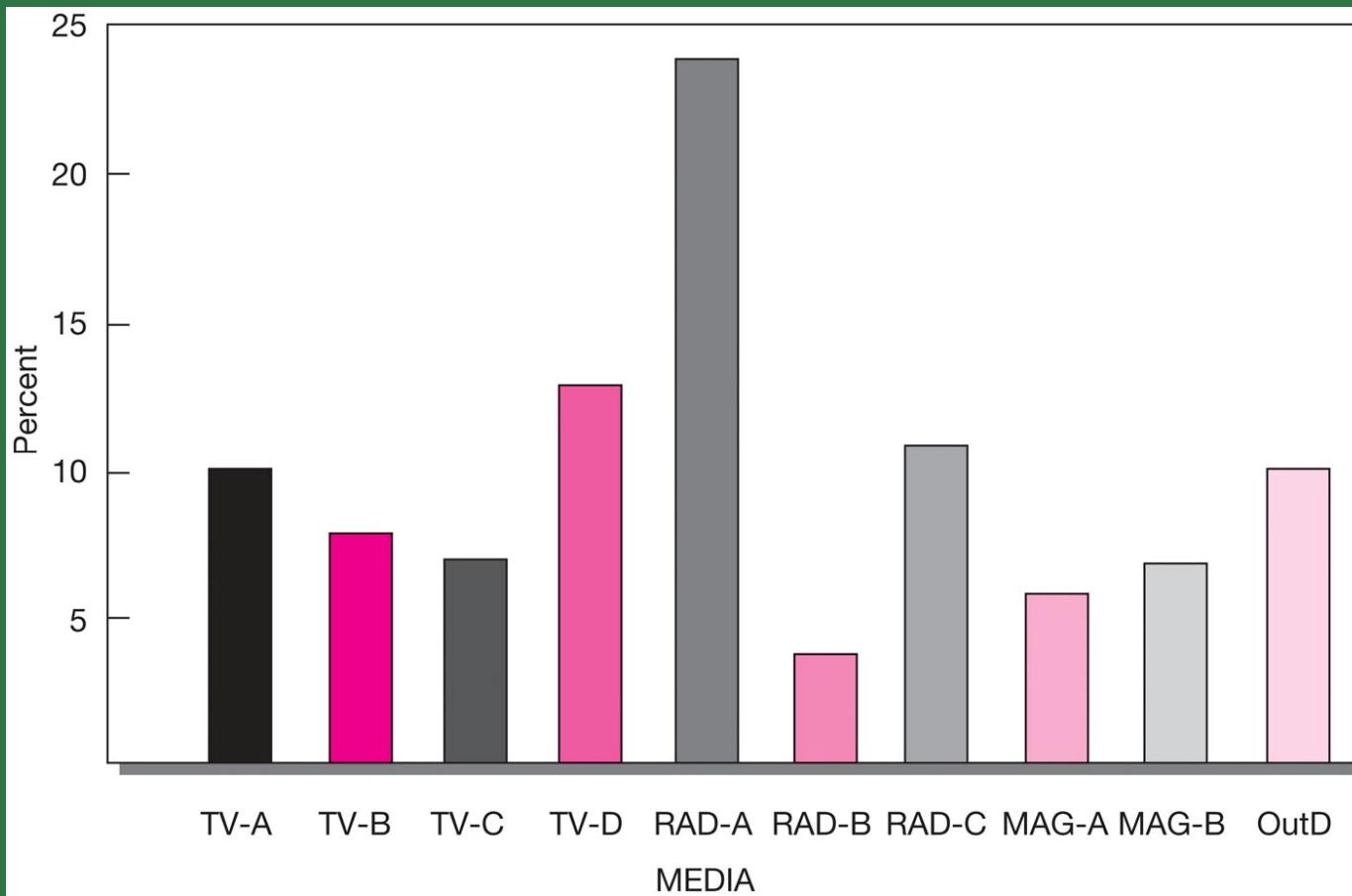
Data Exploration, Examination, and Analysis in the Research Process



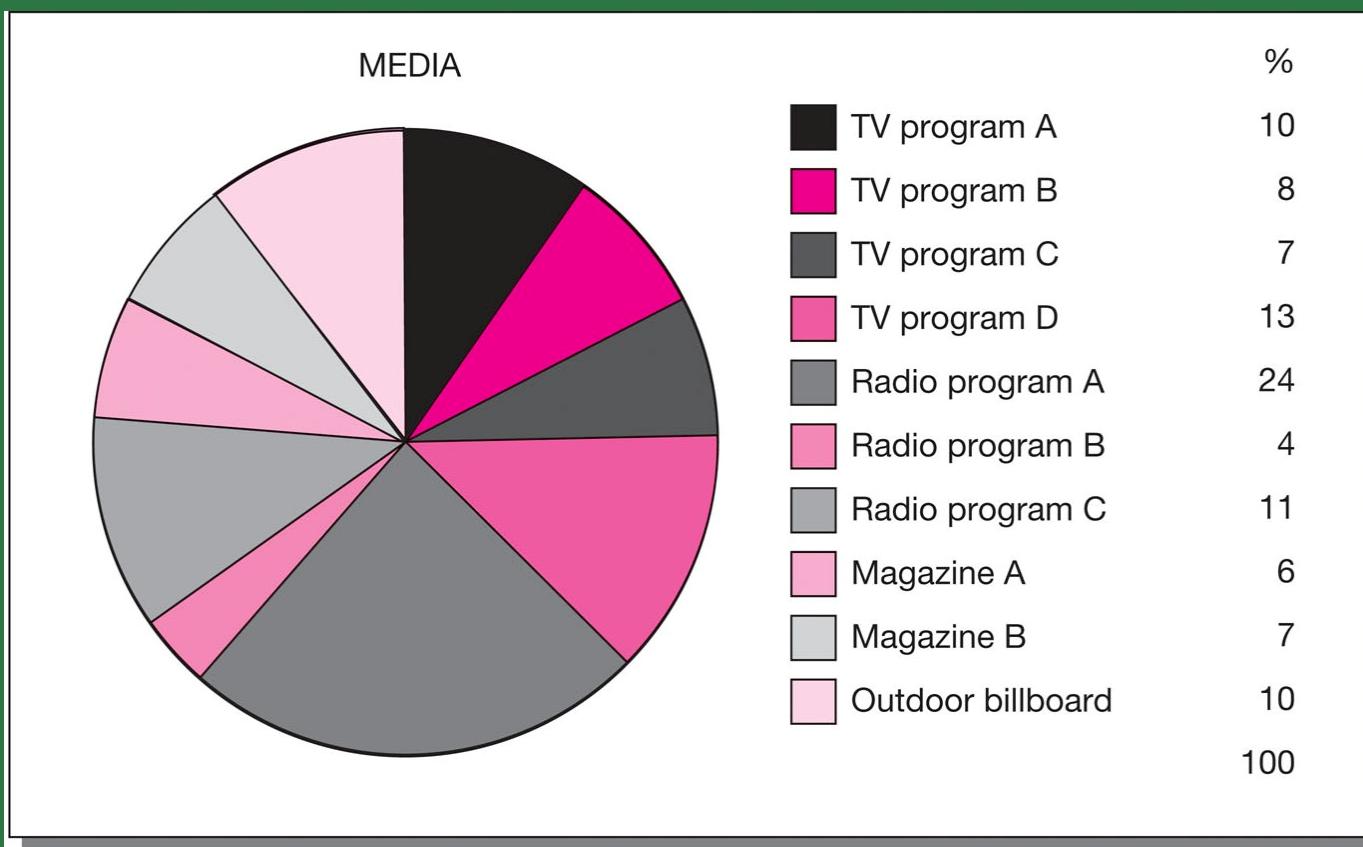
Frequency of Ad Recall

Value Label	Value	Frequency	Percent	Valid Percent	Cumulative Percent
TV program A	1	10	10.0	10.0	10.0
TV program B	2	8	8.0	8.0	18.0
TV program C	3	7	7.0	7.0	25.0
TV program D	4	13	13.0	13.0	38.0
Radio program A	5	24	24.0	24.0	62.0
Radio program B	6	4	4.0	4.0	66.0
Radio program C	7	11	11.0	11.0	77.0
Magazine A	8	6	6.0	6.0	83.0
Magazine B	9	7	7.0	7.0	90.0
Outdoor billboard	10	<u>10</u>	<u>10.0</u>	<u>10.0</u>	100.0
Total		100	100.0	100.0	
Valid cases	100				
Missing cases	0				

Bar Chart



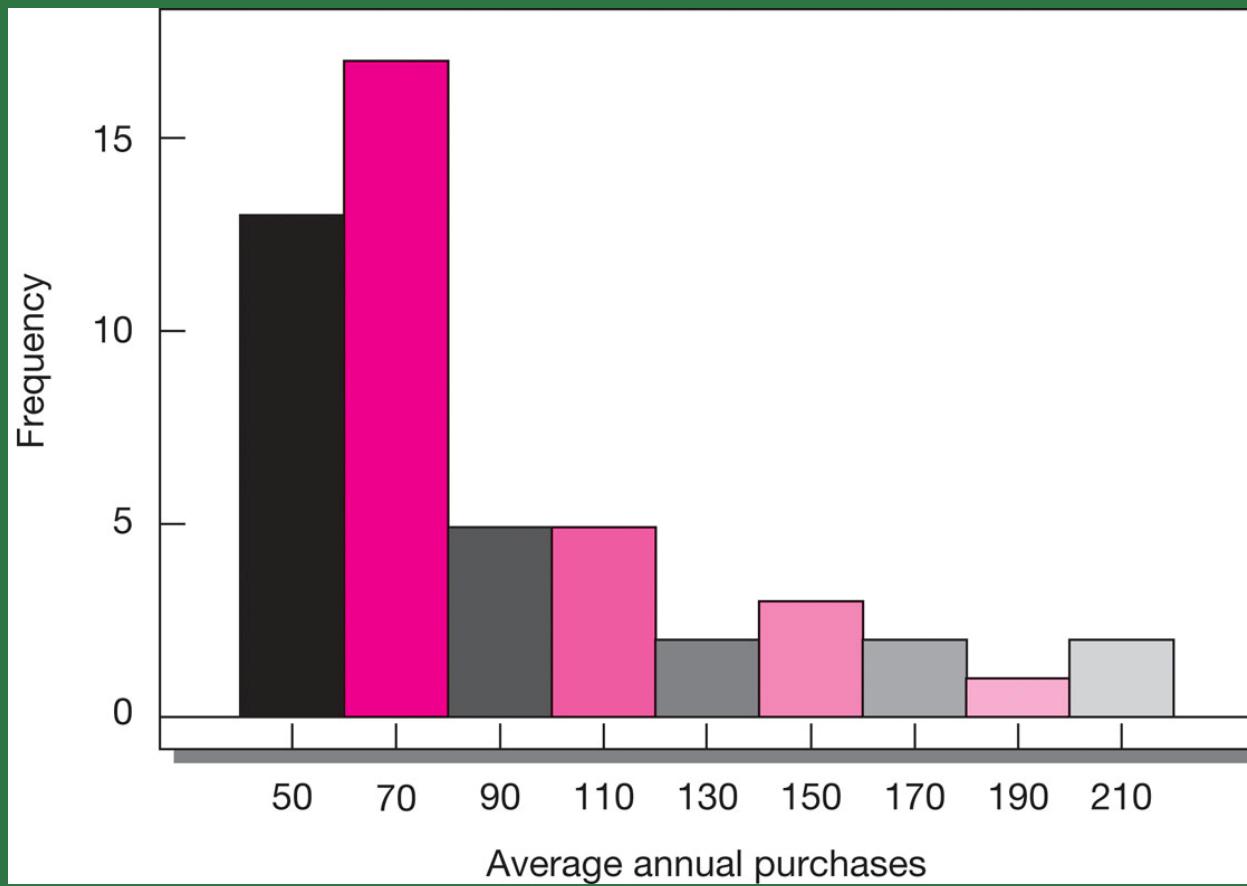
Pie Chart



Frequency Table

Value	Frequency	Percent	Cumulative	Value	Frequency	Percent	Cumulative
			Percent				Total
54.9	1	2	2	75.6	1	2	54
55.4	1	2	4	76.4	1	2	56
55.6	1	2	6	77.5	1	2	58
56.4	1	2	8	78.9	1	2	60
56.8	1	2	10	80.9	1	2	62
56.9	1	2	12	82.2	1	2	64
57.8	1	2	14	82.5	1	2	66
58.1	1	2	16	86.4	1	2	68
58.2	1	2	18	88.3	1	2	70
58.3	1	2	20	102.5	1	2	72
58.5	1	2	22	104.1	1	2	74
59.9	2	4	26	110.4	1	2	76
61.5	1	2	28	111.9	1	2	78
62.6	1	2	30	118.6	1	2	80
64.8	1	2	32	123.8	1	2	82
66.0	2	4	36	131.2	1	2	84
66.3	1	2	38	140.9	1	2	86
67.6	1	2	40	146.2	1	2	88
69.1	1	2	42	153.2	1	2	90
69.2	1	2	44	163.2	1	2	92
70.5	1	2	46	166.7	1	2	94
72.7	1	2	48	183.2	1	2	96
72.9	1	2	50	206.9	1	2	98
73.5	1	2	52	218.2	1	2	100
				Total	50	100	

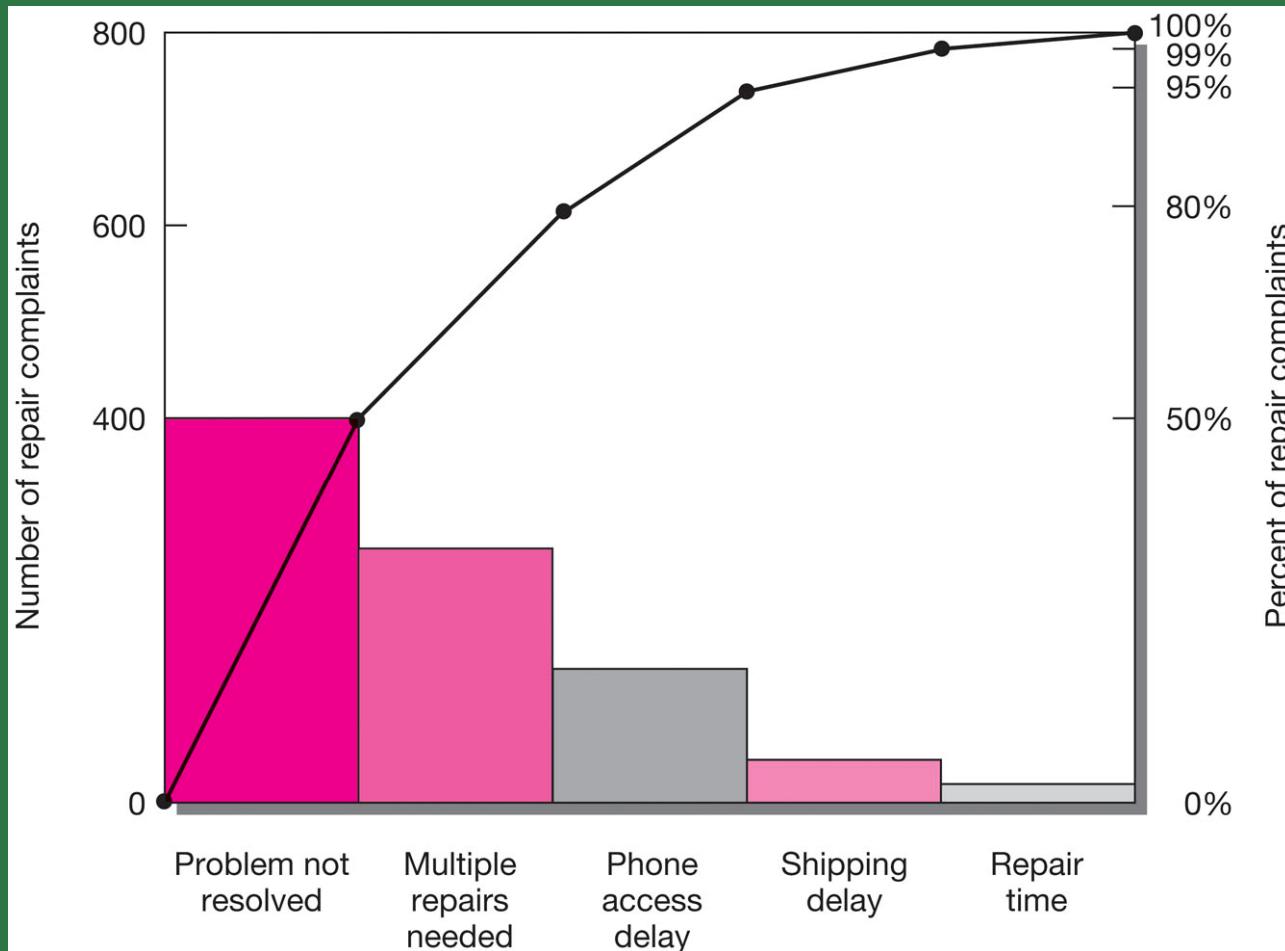
Histogram



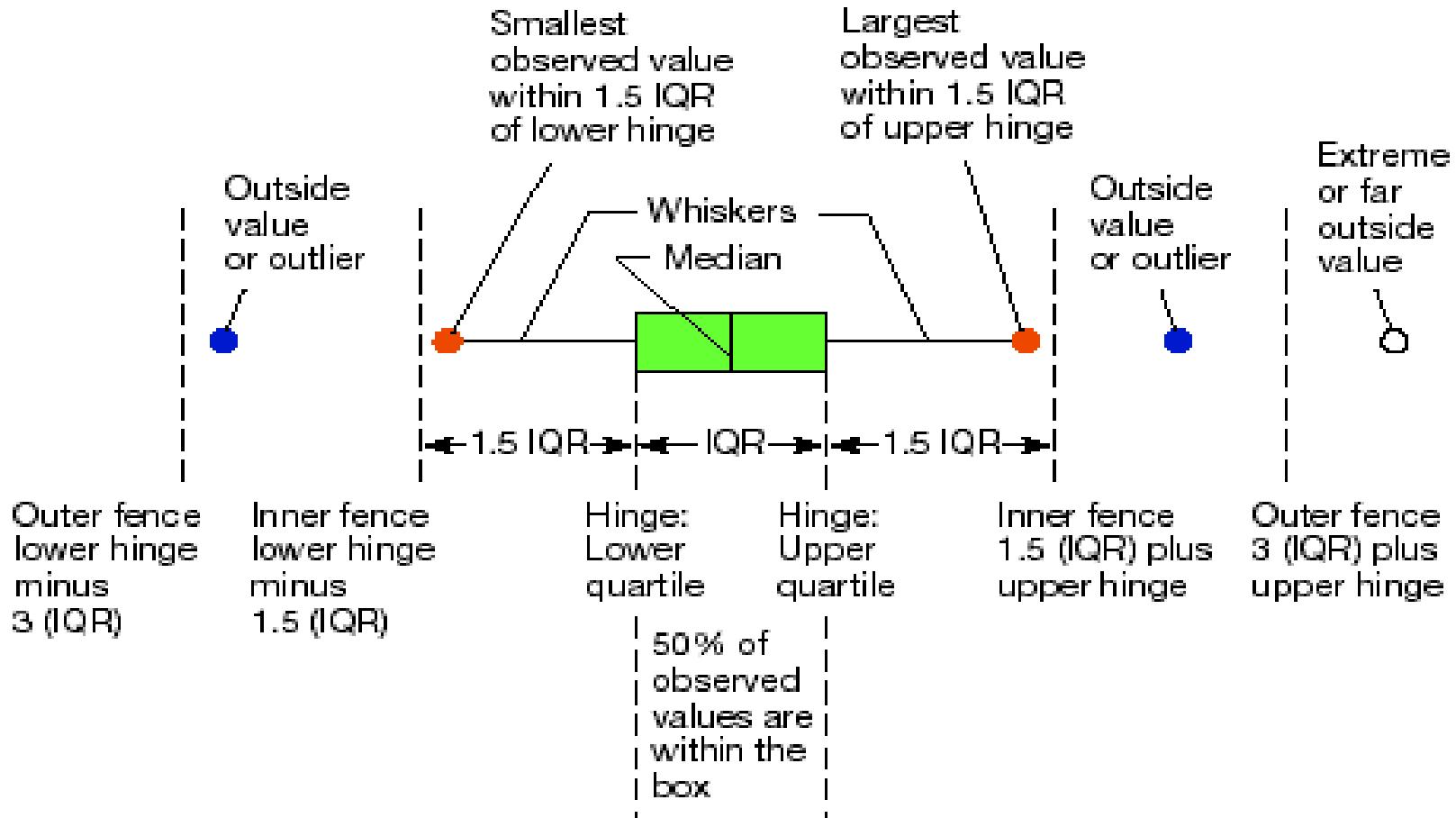
Stem-and-Leaf Display

5	455666788889
6	12466799
7	02235678
8	02268
9	
10	24
11	018
12	3
13	1
14	06
15	3
16	36
17	
18	3
19	
20	6
21	8

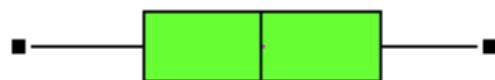
Pareto Diagram



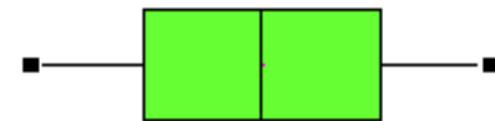
Boxplot Components



Diagnostics with Boxplots



Symmetric



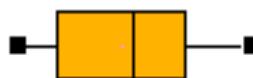
Symmetric—
larger relative size in
proportion to sample size



Right skewed



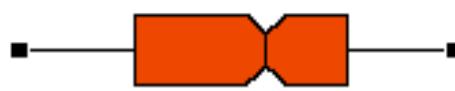
Left skewed



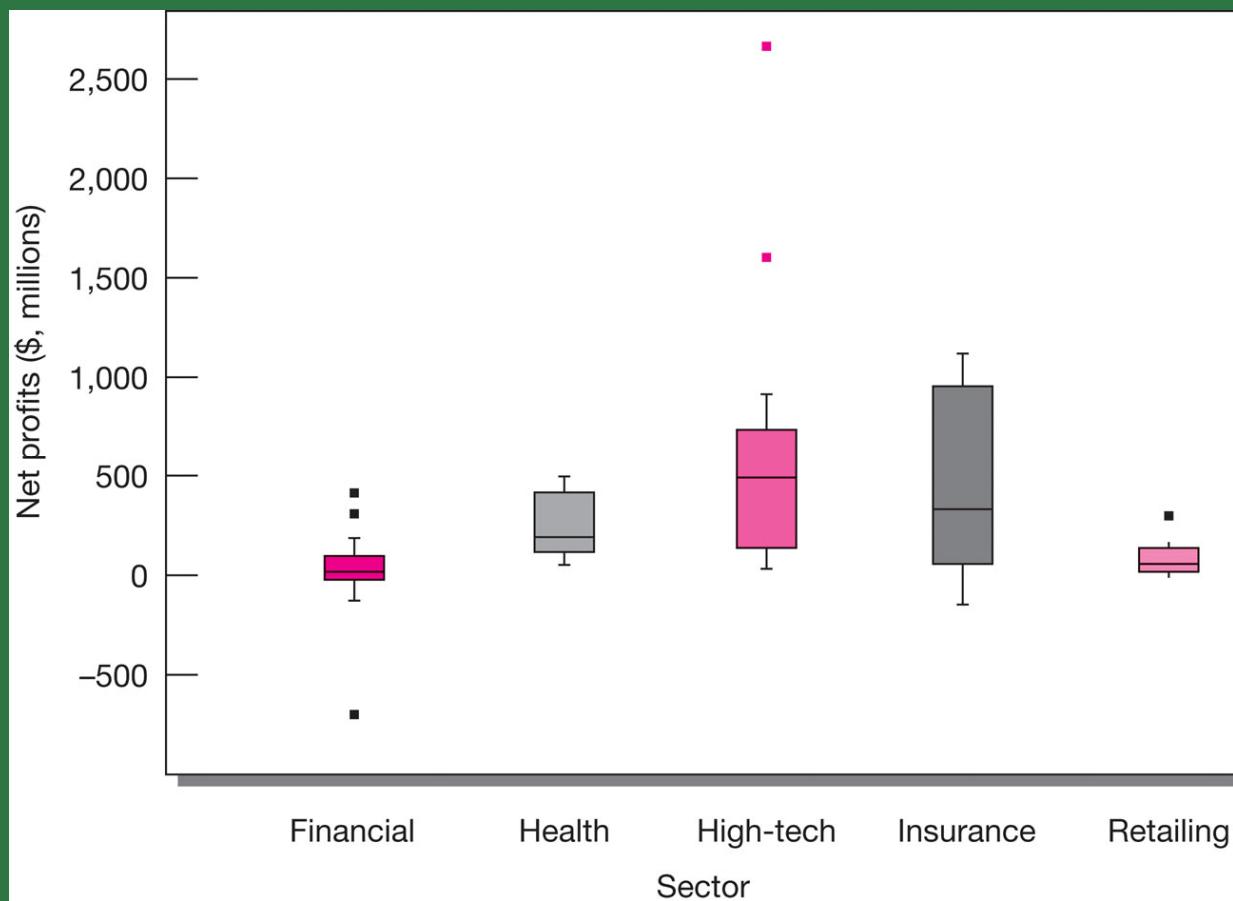
Small spread



Notched at the median for a test of
the equality of population medians

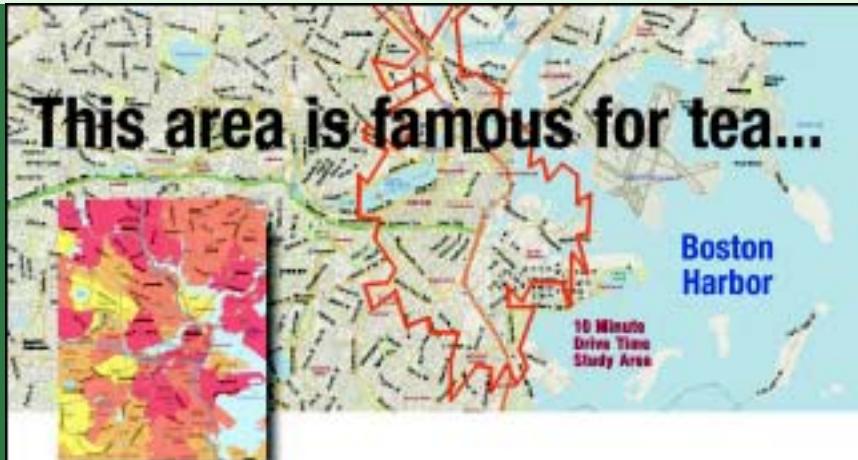


Boxplot Comparison



Mapping

This area is famous for tea...



but will it buy cappuccinos?

Characteristics	Boston Tea Party Ship 10-mile Drive Time	Boston, MA	Massachusetts
Residential Population	954,791	691,400	6,360,077
Median Age	32.6 years	31.7 years	38.8 years
% of Population Age 25 to 34	25.8%	20.5%	14.1%
Daytime Population	445,107	368,740	3,879,460
Total Households	71,018	54,420	347,248
% of Households with Children	14.8%	25.5%	31.7%
% of Households with no Vehicles	67.2%	56.3%	51.5%
Average Household Income	\$55,032	\$33,025	\$36,711
Total Businesses	31,208	24,081	268,780
No. of Eating & Drinking Places	1,280	1,290	14,812
Sales of Eating & Drinking Places	\$1,152 million	\$1,150 million	\$16.152 billion
No. of Hotels & Other Lodging	88	113	2,280
Top PRISM Cluster	Young Urban	Suburban Mix	High Quality

Site selection is a serious business. Fortunately, PCensus helps put the decision right on the money. Now you can easily profile any North American location or target a list of areas that match a specific lifestyle.

PCensus works with the major mapping software to give a demographic profile of the area in question using census, geolocator or drive times. A profile report organizes the detailed census data into easy to handle categories, such as age or income distribution.

Conversely, targeting enables you to identify potential sites by defining a lifestyle. PCensus finds and ranks all the places, census tracts, block groups or zip codes matching a specific lifestyle – say households with income greater than \$80,000.

Anyone can use PCensus to support business decisions, whether it's opening a retail outlet or establishing a new service for a changing community. It's your grounds for success!

PCensus

For a free personalized online demo, call 1.800.963.1334 or visit www.pcensus.com

MapPoint

MapPoint is a registered trademark of Microsoft Corporation.

MapPoint

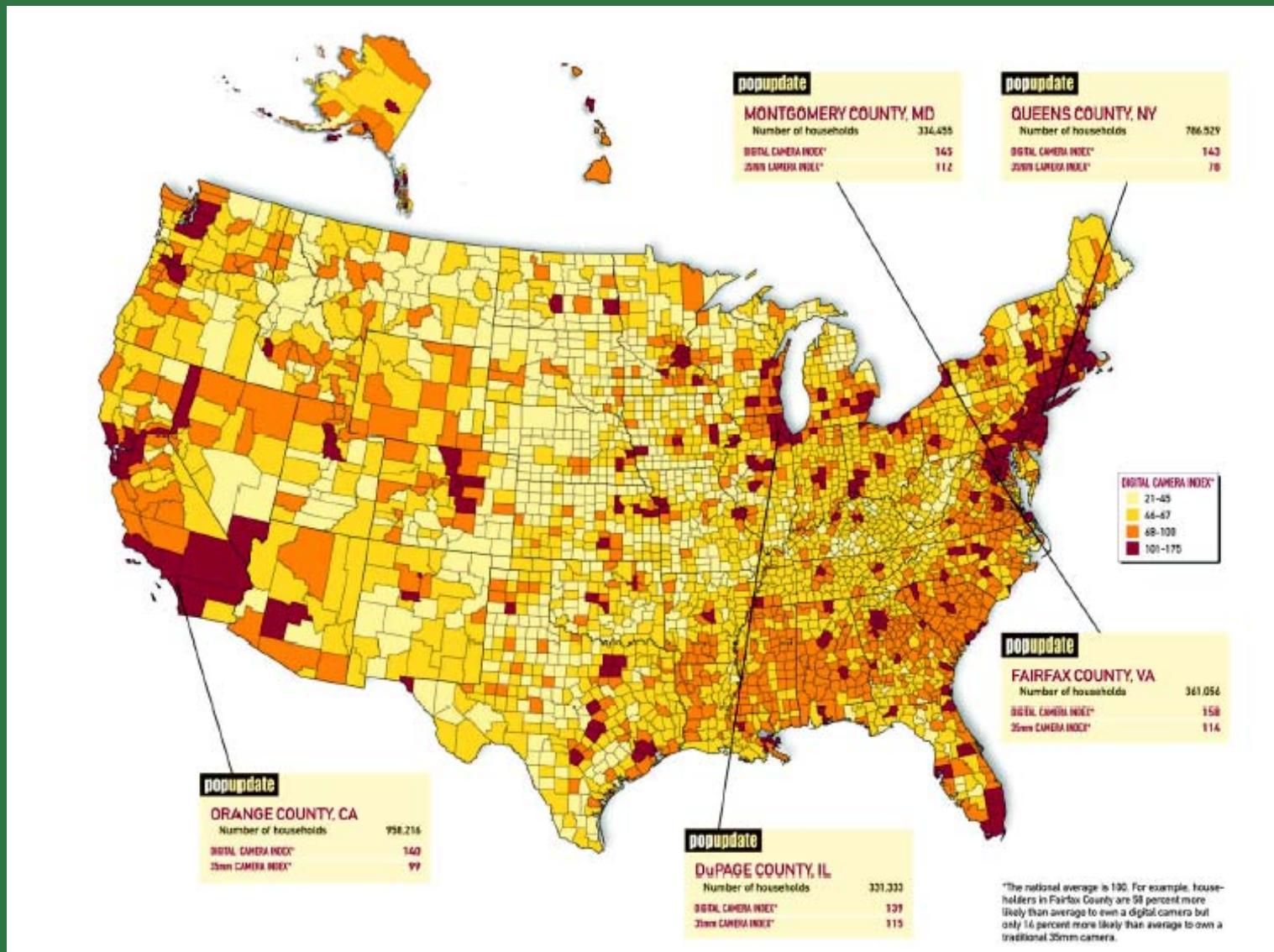
CLARITY

2000 Census

TETRAD

Computer Applications Inc.
Email: info@tetrad.com

Geograph: Digital Camera Ownership



SPSS Cross-Tabulation

		OVERSEAS ASSIGNMENT								
		Count		Yes		No				
		Row Pct	Col Pct	1	2			Row Total		
GENDER	Male	1	22	40				62		
			35.5	64.5				62.0		
	Female	2	78.6	55.6				38		
			22.0	40.0				38.0		
Cell 2, 1 (row 2, column 1)				6	32					
				15.8	84.2					
				21.4	44.4					
				6.0	32.0					
		Column Total		28	72			100		
				28.0	72.0			100.0		

Marginals

Percentages in Cross-Tabulation

Study 1

OVERSEAS ASSIGNMENT

		Yes		No		Row Total
		Count	Row Pct	Col Pct	Tot Pct	
		1	2			
		22	40	62		
GENDER	Male	22	40	62		
		35.5	64.5	62.0		
		78.6	55.6	62.5		
		22.0	40.0	59.2		
Female	2	6	32	38		
		15.8	84.2	38.0		
		21.4	44.4	40.8		
		6.0	32.0	31.0		
Column Total		28	72	100		
Total		28.0	72.0	100.0		

Study 2

OVERSEAS ASSIGNMENT

		Yes		No		Row Total
		Count	Row Pct	Col Pct	Tot Pct	
		1	2			
		225	675	900		
GENDER	Male	225	675	900		
		25.0	75.0	60.0		
		62.5	59.2	59.2		
		15.0	45.0	45.0		
Female	2	135	465	600		
		22.5	77.5	40.0		
		37.5	40.8	37.5		
		9.0	31.0	22.5		
Column Total		360	1140	1500		
Total		24.0	76.0	100.0		

Guidelines for Using Percentages

Averaging percentages

Use of too large percentages

Using too small a base

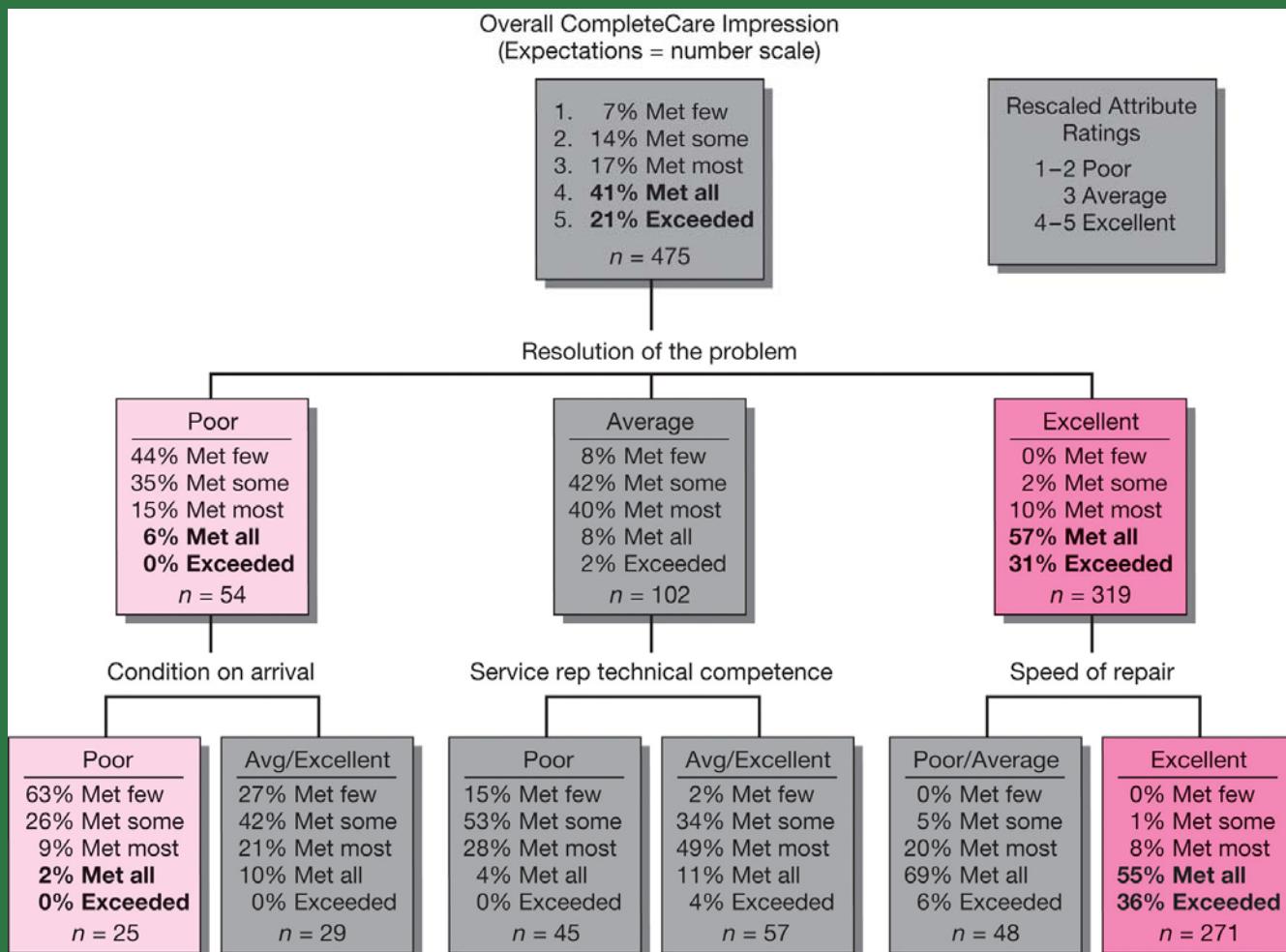
Percentage decreases can
never exceed 100%

Cross-Tabulation with Control and Nested Variables

	Control Variable					
	Category 1			Category 2		
	Nested Variable			Nested Variable		
Stub...	Cells...					

	SEX OF EMPLOYEE			
	MALES		FEMALES	
	MINORITY CLASSIFICATION		MINORITY CLASSIFICATION	
	WHITE	NONWHITE	WHITE	NONWHITE
EMPLOYMENT CATEGORY				
CLERICAL	16%	7%	18%	7%
OFFICE TRAINEE	7%	3%	17%	2%
SECURITY OFFICER	3%	3%		
COLLEGE TRAINEE	7%	0%	1%	
EXEMPT EMPLOYEE	6%	0%	0%	
MBA TRAINEE	1%	0%	0%	
TECHNICAL	1%			

Automatic Interaction Detection (AID)



Exploratory Data Analysis

We have 610 pages of research
that all lead to one conclusion.

You'd rather not go through 610 pages
of research to get a conclusion.



Cut to the chase.



Booth Research Services
1-800-727-2577 / www.boothresearch.com

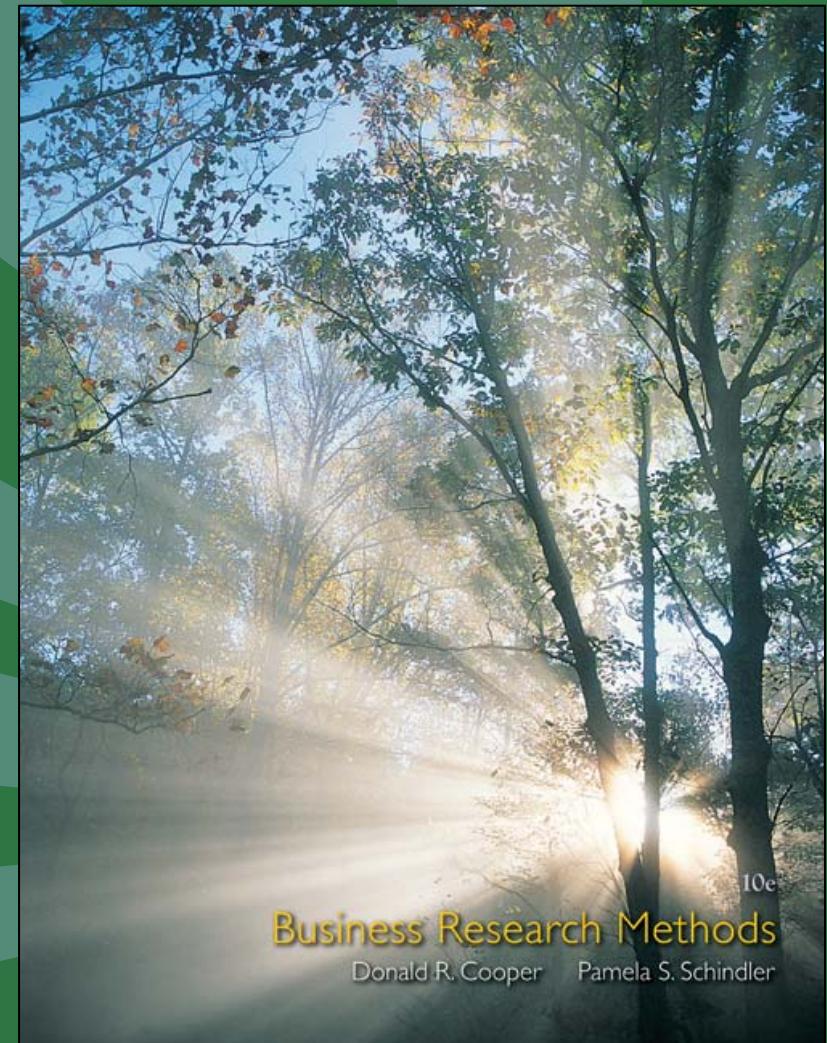
This Booth Research Services ad suggests that the researcher's role is to make sense of data displays.

Great data exploration and analysis delivers insight from data.

Key Terms

- Automatic interaction detection (AID)
- Boxplot
- Cell
- Confirmatory data analysis
- Contingency table
- Control variable
- Cross-tabulation
- Exploratory data analysis (EDA)
- Five-number summary
- Frequency table
- Histogram
- Interquartile range (IQR)
- Marginals
- Nonresistant statistics
- Outliers
- Pareto diagram
- Resistant statistics
- Stem-and-leaf display

Working with Data Tables



Original Data Table

Online Spending and Purchases By Internet Users in Select Countries in Western Europe, September 2006 (average)

	Spending	Purchases
Belgium	Eur 790	6
Denmark	Eur 1159	11
France	Eur 509	8
Germany	Eur 521	10
Italy	Eur 454	7
Netherlands	Eur 681	7
Norway	Eur 1406	7
Spain	Eur 452	5
Sweden	Eur 1013	9
United Kingdom	Eur 1201	18

Source: Synovate and SPA Market Research-UK for the European Interactive Advertising Association (EIAA), January 2007.

80134

www.emarketer.com

Our grateful appreciation to eMarketer for the use of their table.

Arranged by Spending

Western European 6-Month Online Spending and Purchases

	Average Spending (EURO)	Average Number of purchases	Avg Spending (Dollars)*
Norway	1406	7 biggest spenders	\$ 1,823.58
United Kingdom	1201	18	\$ 1,557.70
Denmark	1159	11	\$ 1,503.22
Sweden	1013	9	\$ 1,313.86
Belgium	790	6	\$ 1,024.63
Netherlands	681	7	\$ 883.26
Germany	521	10	\$ 675.74
France	509	8	\$ 660.17
Italy	454	7	\$ 588.84
Spain	452	5 smallest spenders	\$ 586.24

Source: Synovate and SPA Market Research-UK for the European Interactive Advertising Association (EIAA), January 2007.

*1 EURO = 1.2967 Dollars

Arranged by No. of Purchases

Western European 6-Month Online Spending and Purchases

	Average Spending (EURO)	Average Number of purchases
United Kingdom	1201	18 Most frequent buyers
Denmark	1159	11
Germany	521	10
Sweden	1013	9
France	509	8 Average frequency buyers
Norway	1406	7
Netherlands	681	7
Italy	454	7
Belgium	790	6
Spain	452	5 least frequent buyers
Average	818.6	8.8

Source: Synovate and SPA Market Research-UK for the European Interactive Advertising Association (EIAA), January 2007.

Arranged by Avg. Transaction, Highest

Western European 6-Month Online Spending and Purchases

	Average Spending (EURO)	Average Number of purchases	Average transaction (EURO)	Average transaction (Dollars)*
Norway	1406	7	201 specialty shoppers	261
Belgium	790	6	132	171
Sweden	1013	9	113	146
Denmark	1159	11	105	137
Netherlands	681	7	97	126
Spain	452	5	90	117
United Kingdom	1201	18	67	87
Italy	454	7	65	84
France	509	8	64	83
Germany	521	10	52 bargain hunters	68

Source: Synovate and SPA Market Research-UK for the European Interactive Advertising Association (EIAA), January 2007.

*1 EURO = 1.2967 Dollars

Arranged by Avg. Transaction, Lowest

Western European 6-Month Online Spending and Purchases

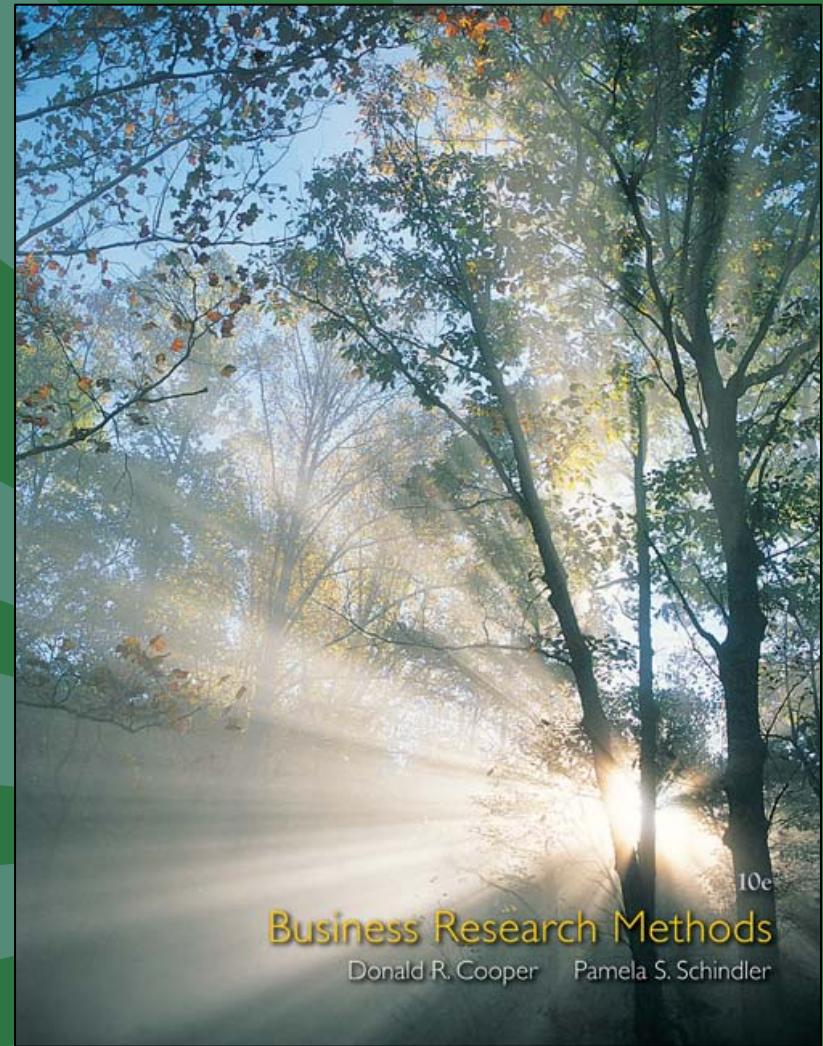
	Average Spending (EURO)	Average Number of purchases	Average transaction (EURO)	Average transaction (Dollars)*
Germany	521	10	52	68
France	509	8	64	83
Italy	454	7	65	84
United Kingdom	1201	18	67	87
Spain	452	5	90	117
Netherlands	681	7	97	126
Denmark	1159	11	105	137
Sweden	1013	9	113	146
Belgium	790	6	132	171
Norway	1406	7	201	261

Source: Synovate and SPA Market Research-UK for the European Interactive Advertising Association (EIAA), January 2007.

*1 EURO = 1.2967 Dollars

Chapter 17

Hypothesis Testing





Learning Objectives

Understand . . .

- The nature and logic of hypothesis testing.
- A statistically significant difference
- The six-step hypothesis testing procedure.



Learning Objectives

Understand . . .

- The differences between parametric and nonparametric tests and when to use each.
- The factors that influence the selection of an appropriate test of statistical significance.
- How to interpret the various test statistics

PulsePoint: Research Revelation

96

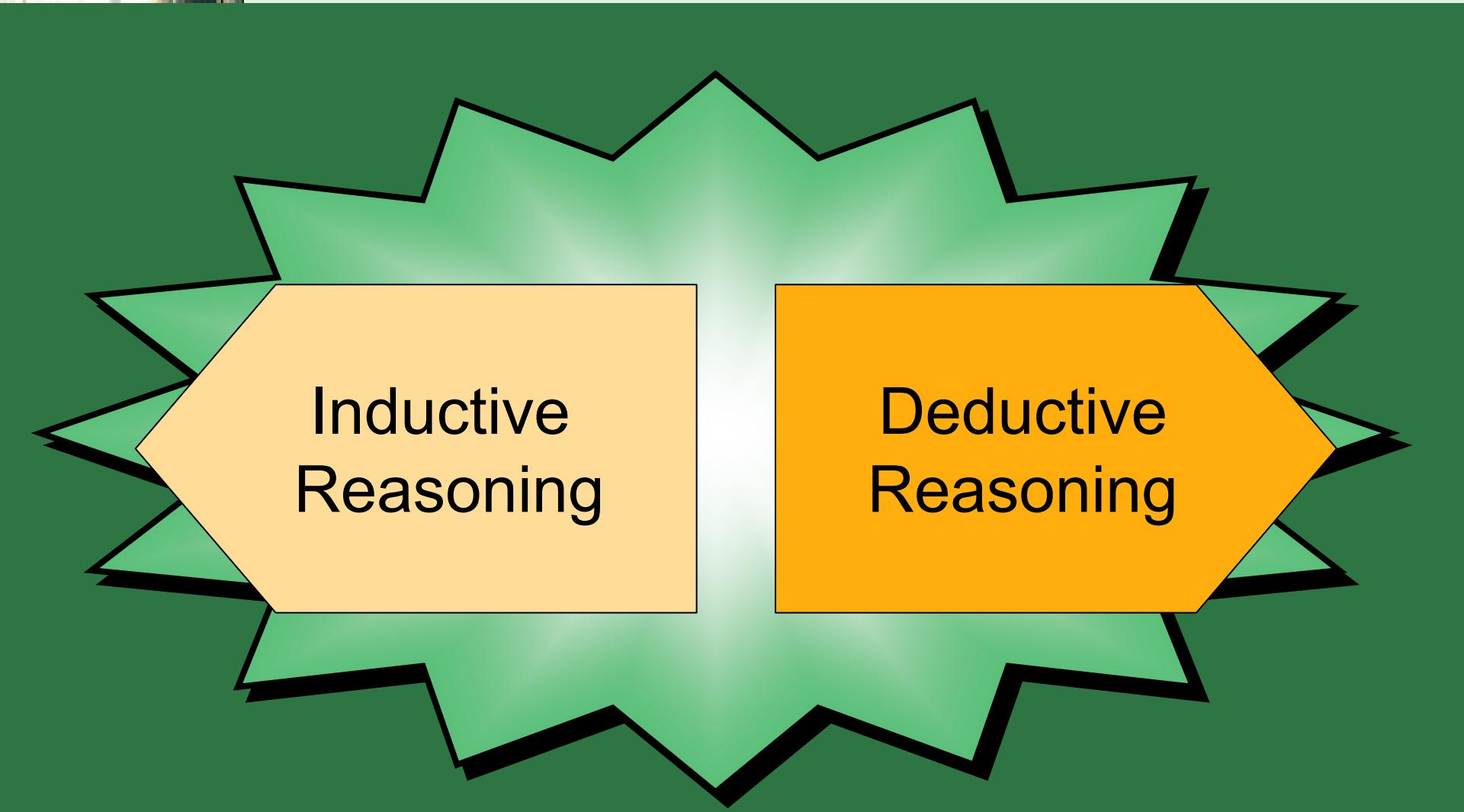
The percent of U.S. college students interviewed at 375 universities in 2006 who misidentified the country of origin of products made in Finland (Nokia).

Hypothesis Testing Finds Truth

“One finds the truth by making a hypothesis and comparing the truth to the hypothesis.”

David Douglass, physicist
University of Rochester

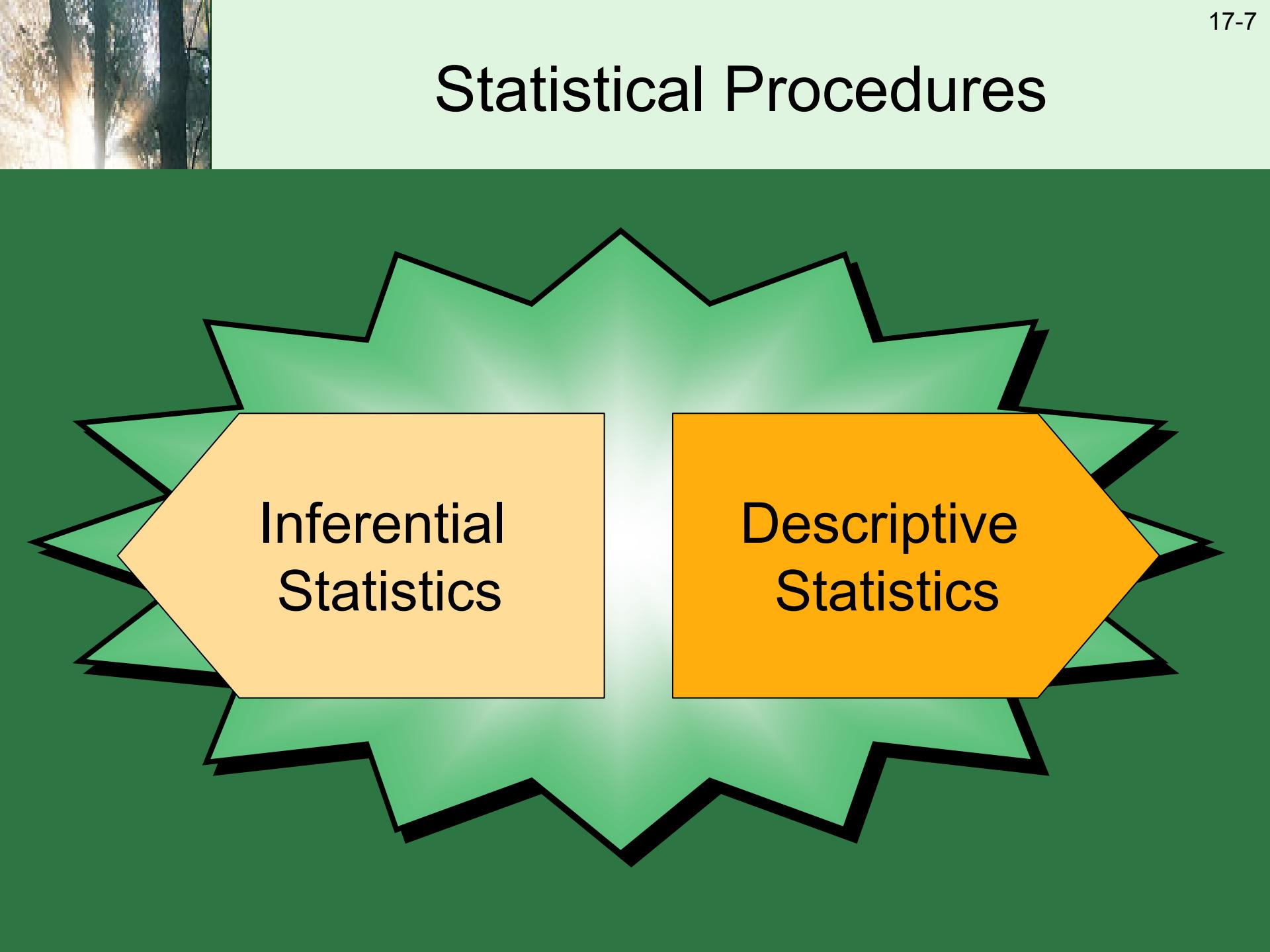
Hypothesis Testing



Inductive
Reasoning

Deductive
Reasoning

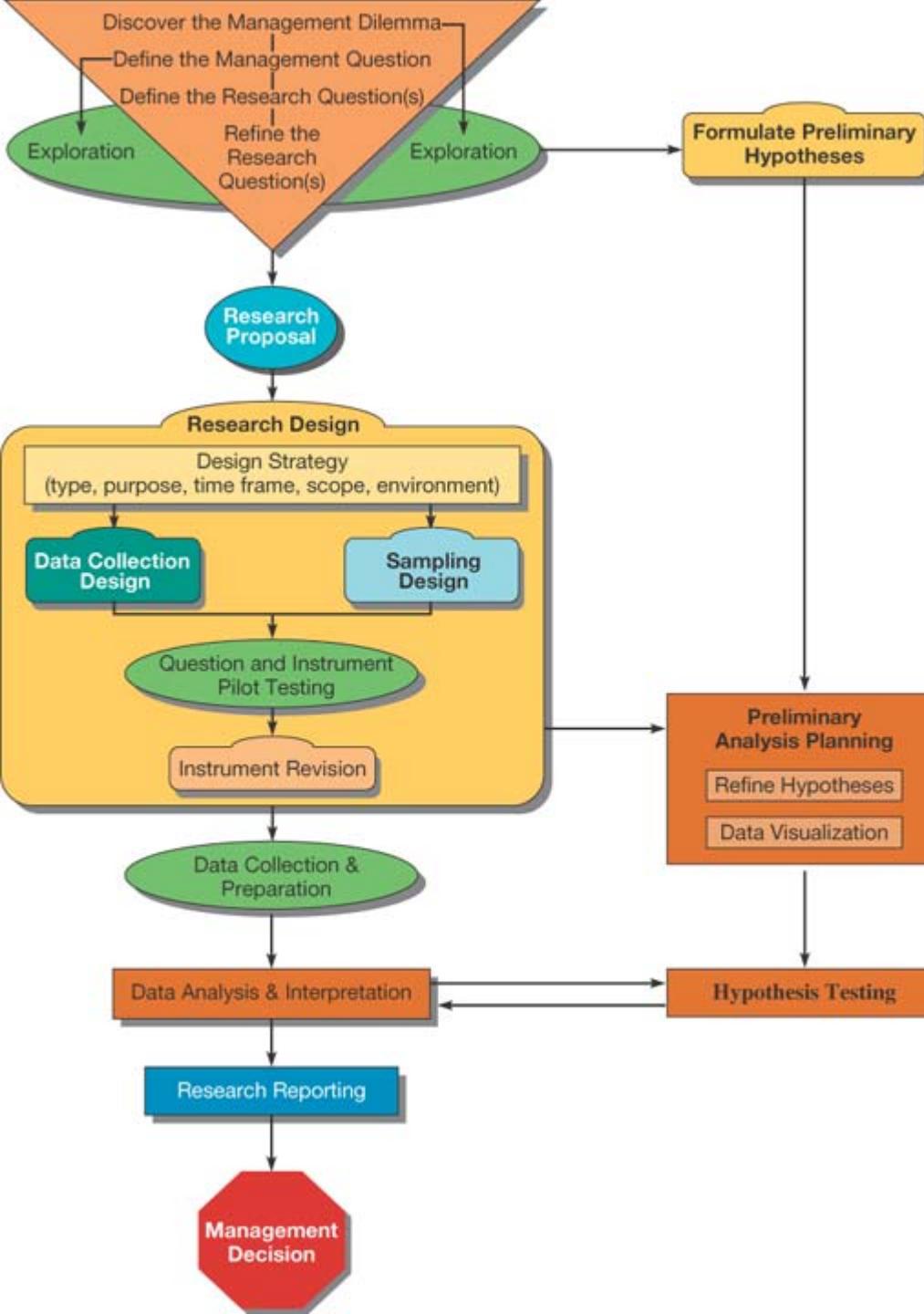
Statistical Procedures



**Inferential
Statistics**

**Descriptive
Statistics**

Hypothesis Testing and the Research Process



When Data Present a Clear Picture



The “ah-ha” moment.

The clouds part. The light bulb goes on. The picture becomes clear. At Abacus®, we call it the “ah-ha” moment — that instant when a fresh perspective helps you see something that was there all along, but not quite obvious. Abacus can help you sift through the chaos to separate what matters from what doesn’t. We offer innovative marketing solutions that help you see your data in new ways, for more intelligent marketing and more inspired strategies.

Abacus Alliances | Data and List Processing | Marketing Databases | Analytical Services

Abacus.
Contact us for fresh perspectives, new opportunities, and better results.
877.368.2532 | www.abacus-us.com

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abacusa
cabsauc
ucsabas
abucasb
suabcba

Researchers use hypothesis testing to hunt for truth. As Abacus states in this ad, when researchers ‘sift through the chaos’ and ‘find what matters’ they experience the “ah ha!” moment.

Approaches to Hypothesis Testing

Classical statistics

- Objective view of probability
- Established hypothesis is rejected or fails to be rejected
- Analysis based on sample data

Bayesian statistics

- Extension of classical approach
- Analysis based on sample data
- Also considers established subjective probability estimates

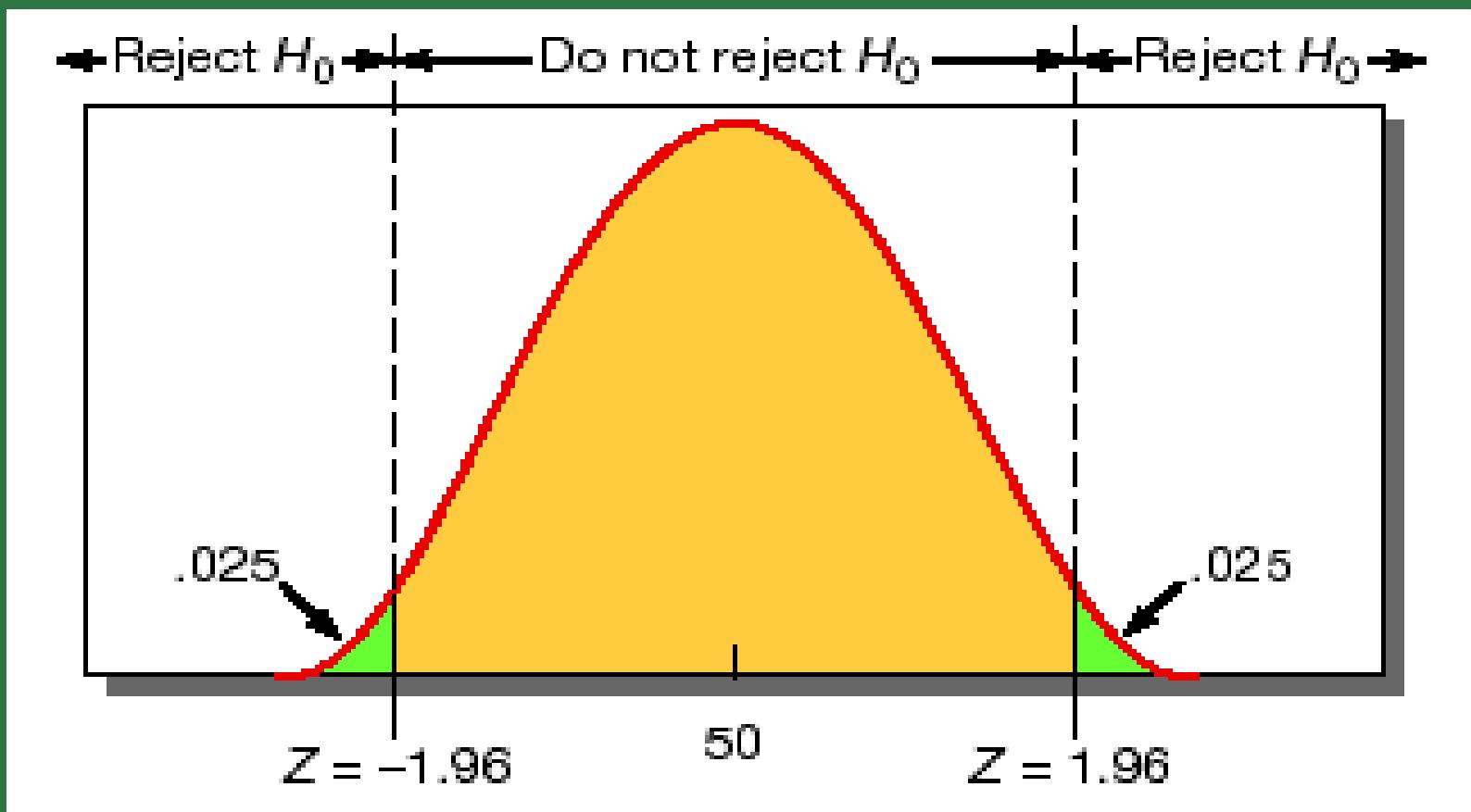
Statistical Significance



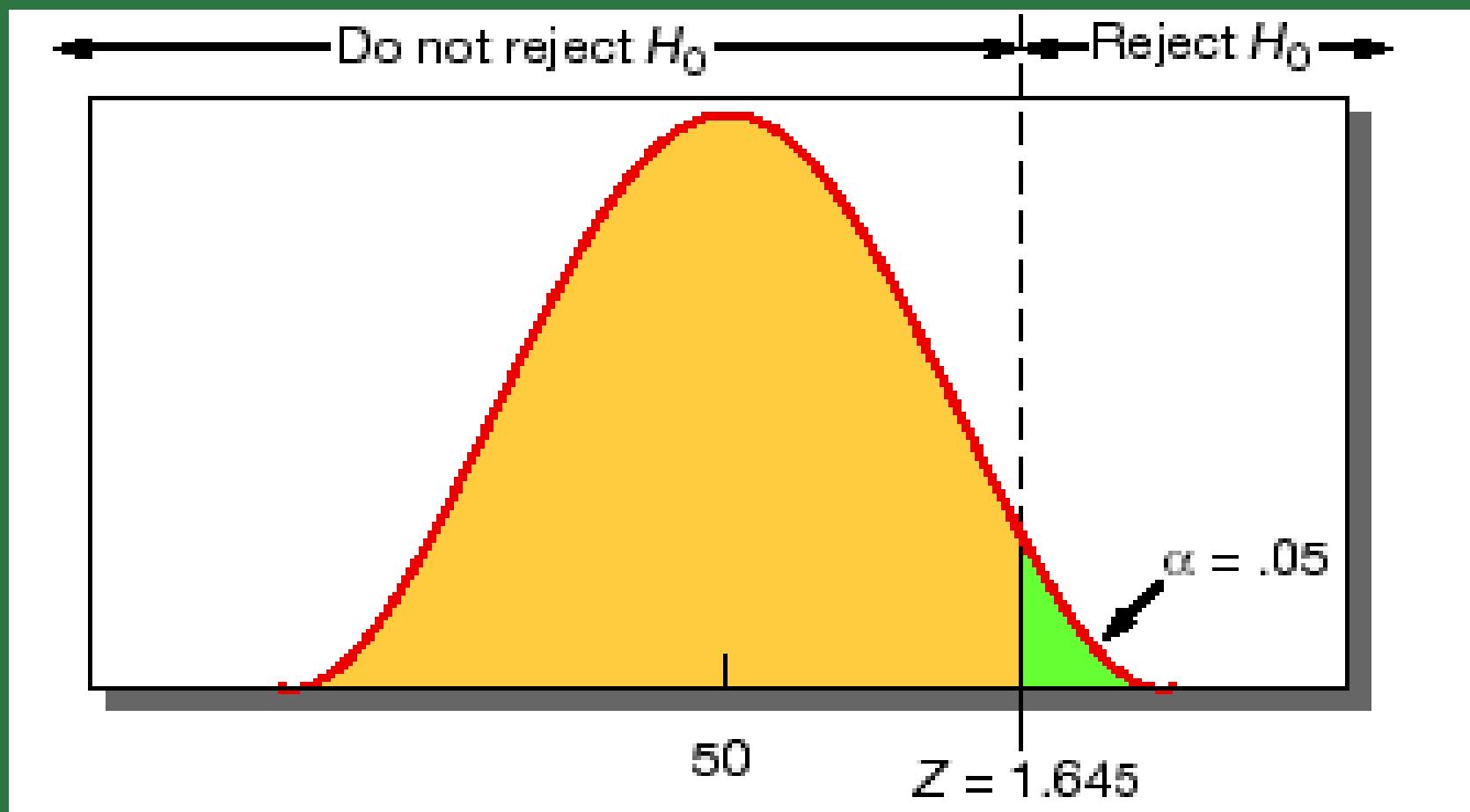
Types of Hypotheses

- Null
 - $H_0: \mu = 50 \text{ mpg}$
 - $H_0: \mu \leq 50 \text{ mpg}$
 - $H_0: \mu \geq 50 \text{ mpg}$
- Alternate
 - $H_A: \mu \neq 50 \text{ mpg}$
 - $H_A: \mu > 50 \text{ mpg}$
 - $H_A: \mu < 50 \text{ mpg}$

Two-Tailed Test of Significance



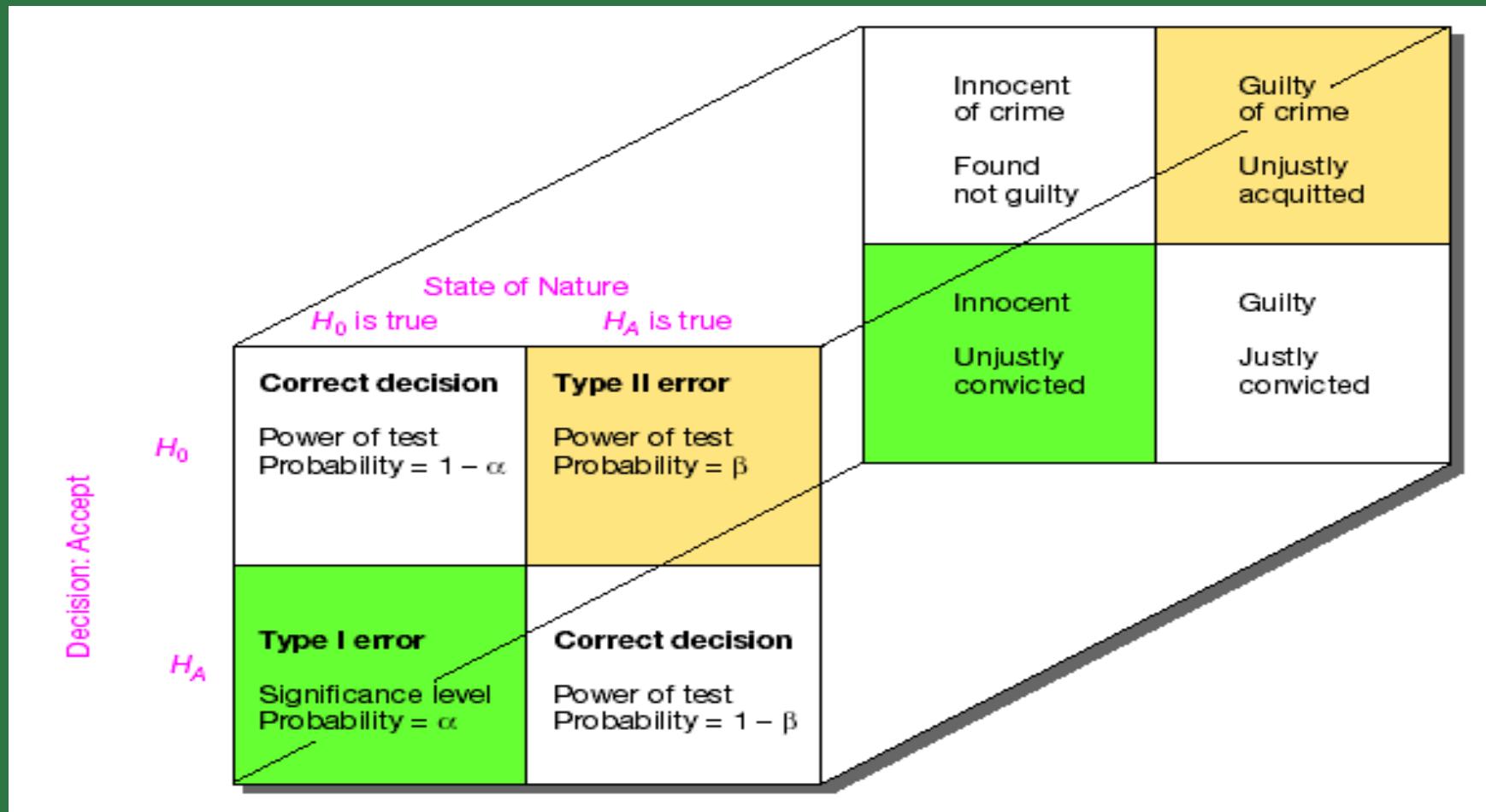
One-Tailed Test of Significance



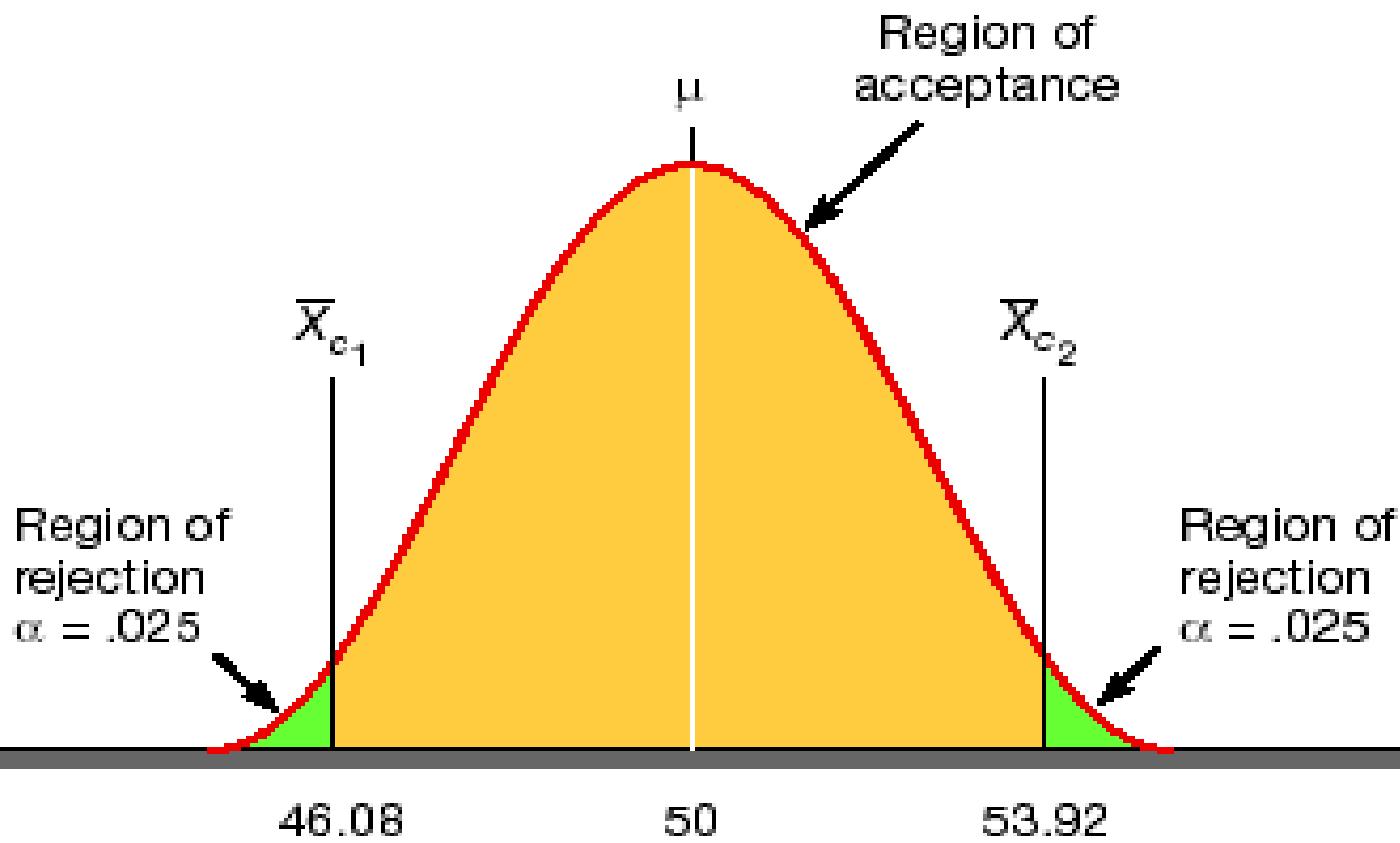
Decision Rule

*Take no corrective action if the analysis shows that one **cannot reject** the null hypothesis.*

Statistical Decisions



Probability of Making a Type I Error



Critical Values

$Z = 1.96$ (significance level = .05)

\bar{X}_c = the critical value of the sample mean

μ = the population value stated in $H_0 = 50$

$\sigma_{\bar{X}}$ = the standard error of a distribution of means of samples of 25

$$Z = \frac{\bar{X} - \mu}{\sigma_{\bar{X}}}$$

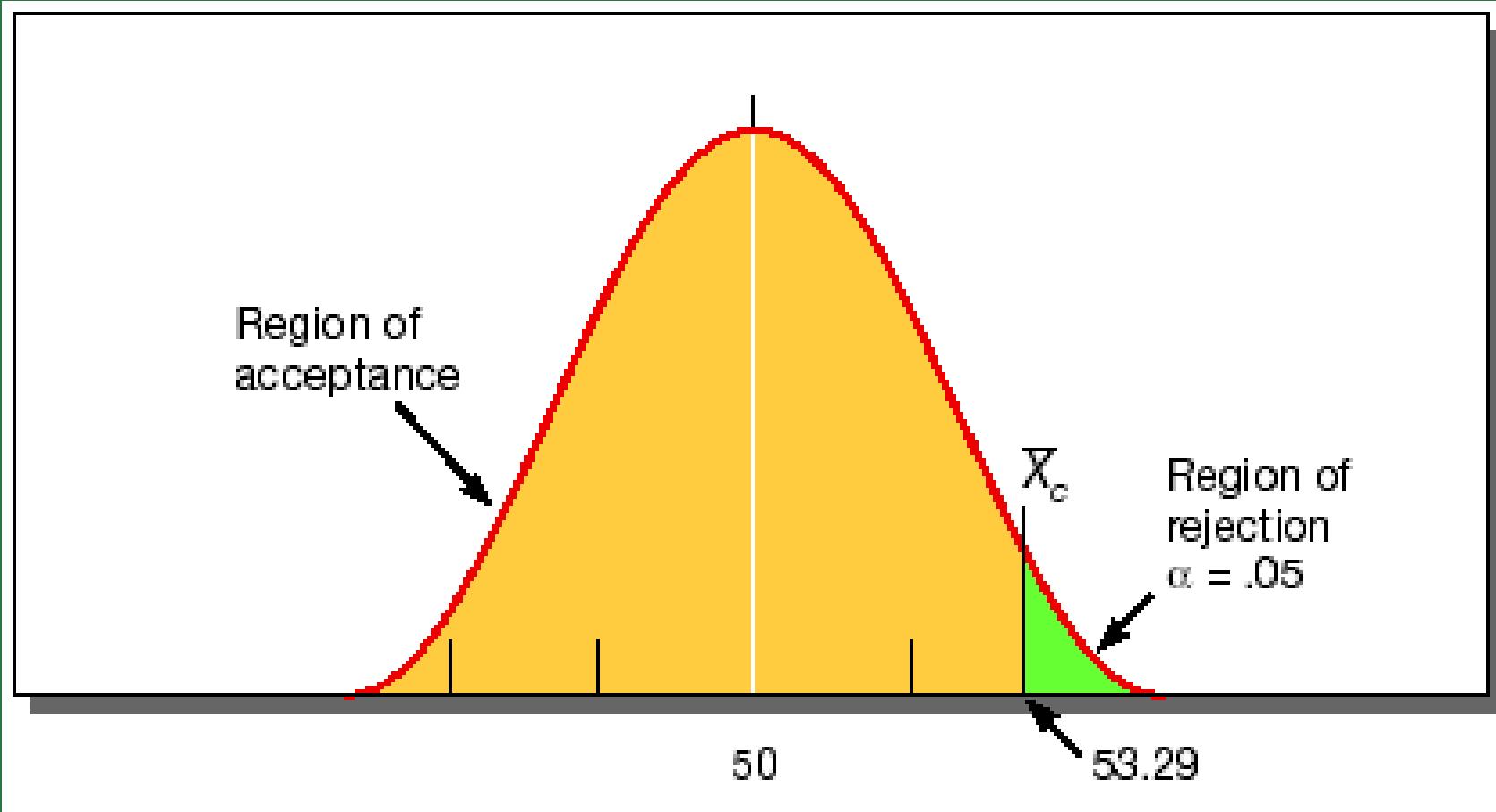
$$-1.96 = \frac{\bar{X}_c - 50}{2}$$

$$1.96 = \frac{\bar{X}_c - 50}{2}$$

$$\bar{X}_c = 46.08$$

$$\bar{X}_c = 53.92$$

Exhibit 17-4 Probability of Making A Type I Error



Factors Affecting Probability of Committing a β Error

True value of parameter

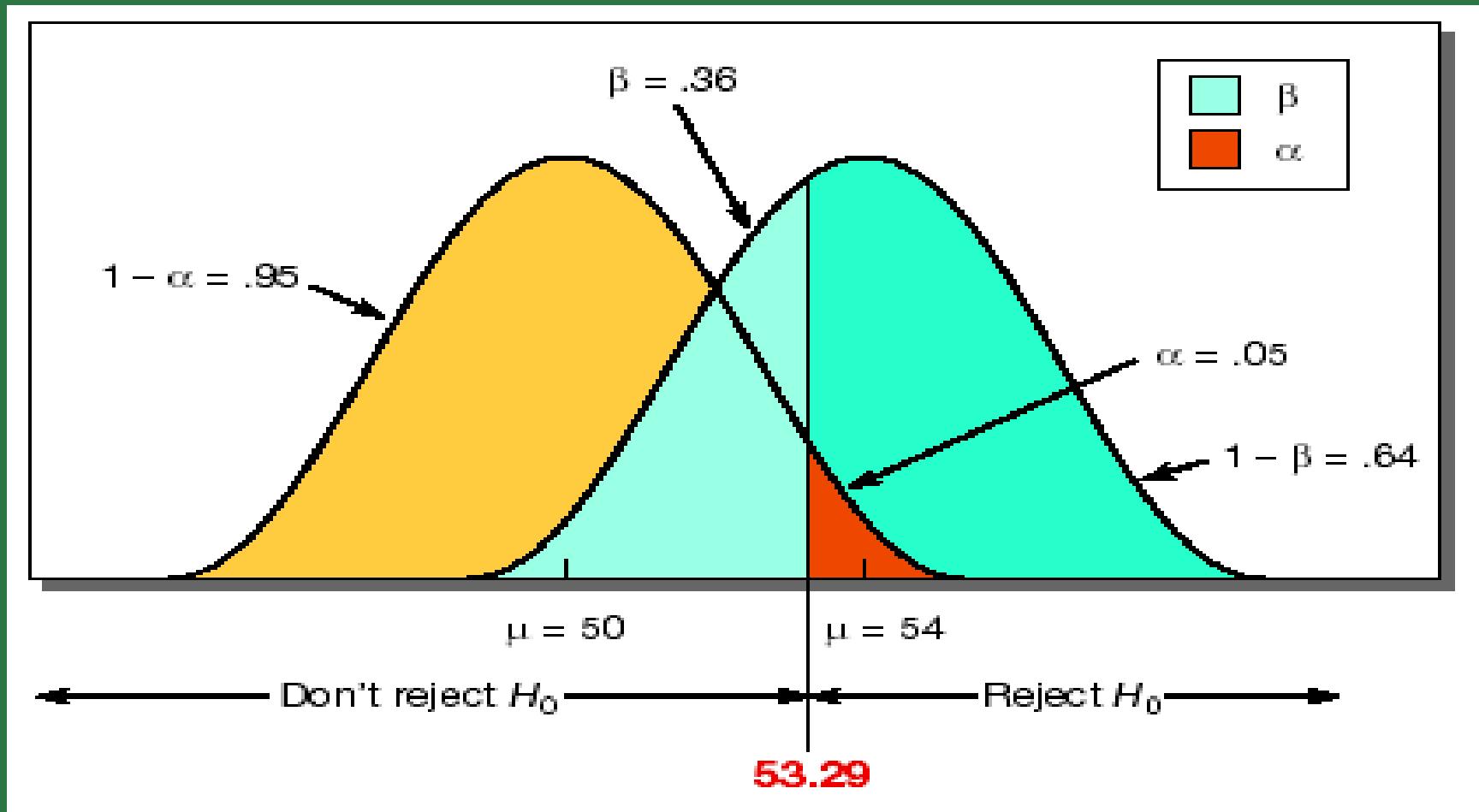
Alpha level selected

One or two-tailed test used

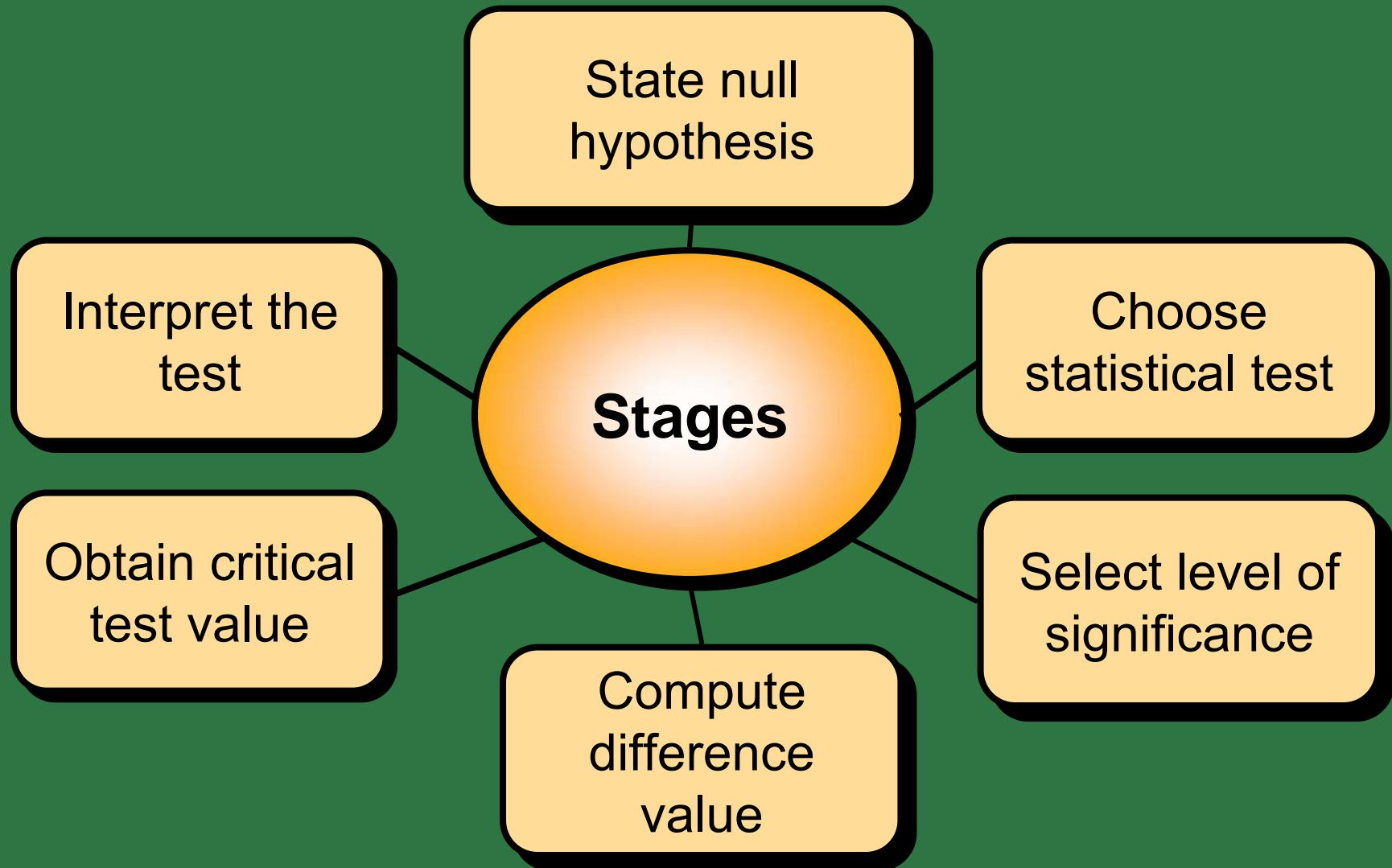
Sample standard deviation

Sample size

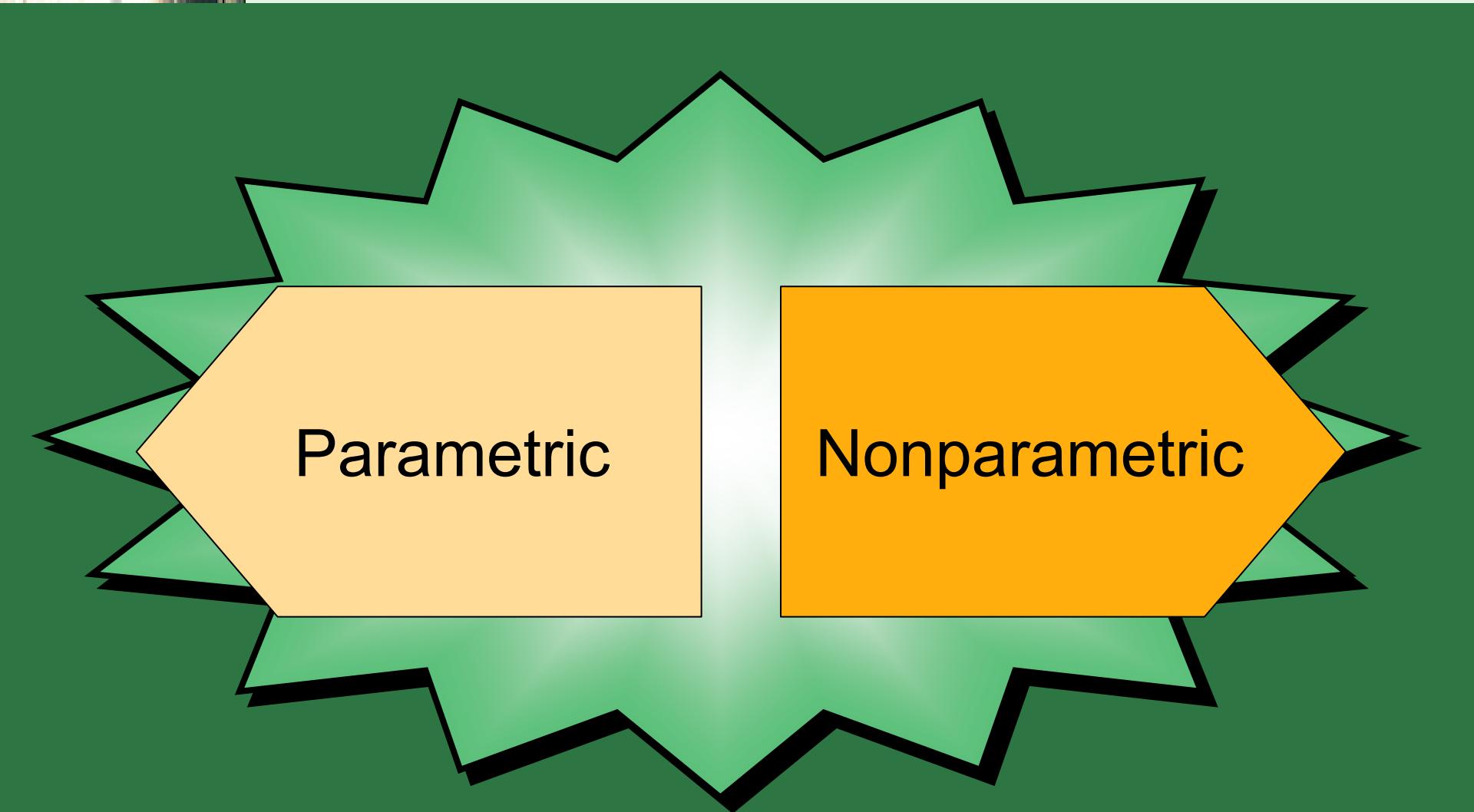
Probability of Making A Type II Error



Statistical Testing Procedures



Tests of Significance



Parametric

Nonparametric

Assumptions for Using Parametric Tests

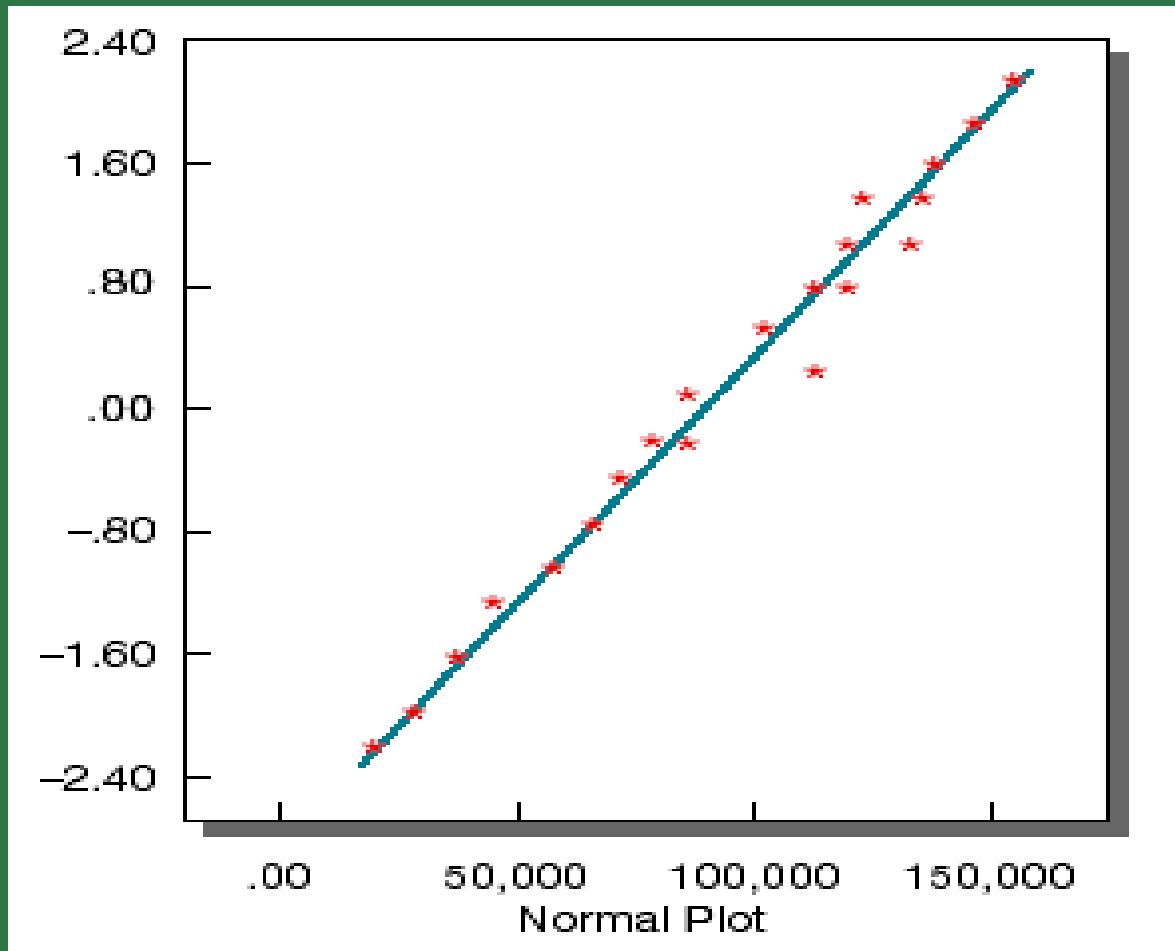
Independent observations

Normal distribution

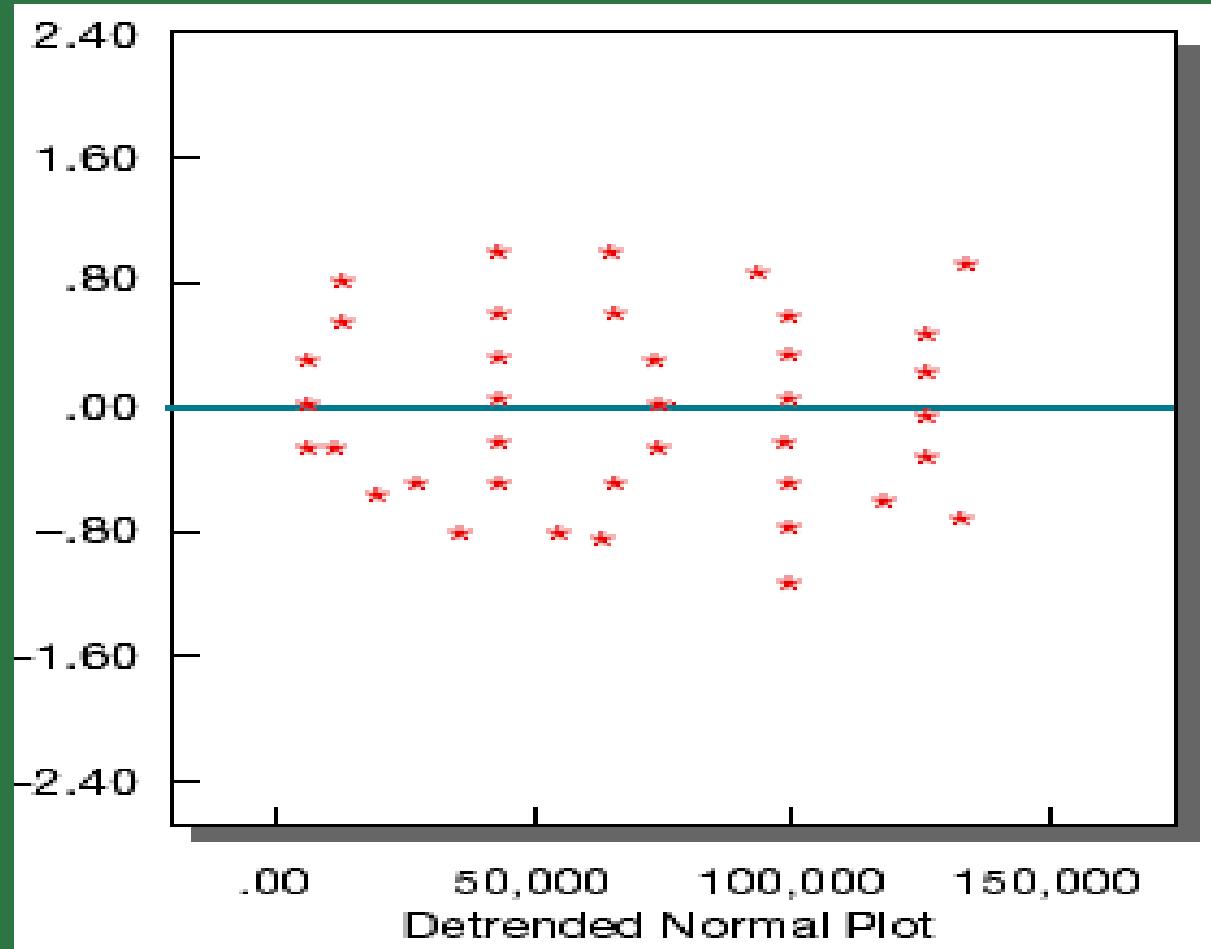
Equal variances

Interval or ratio scales

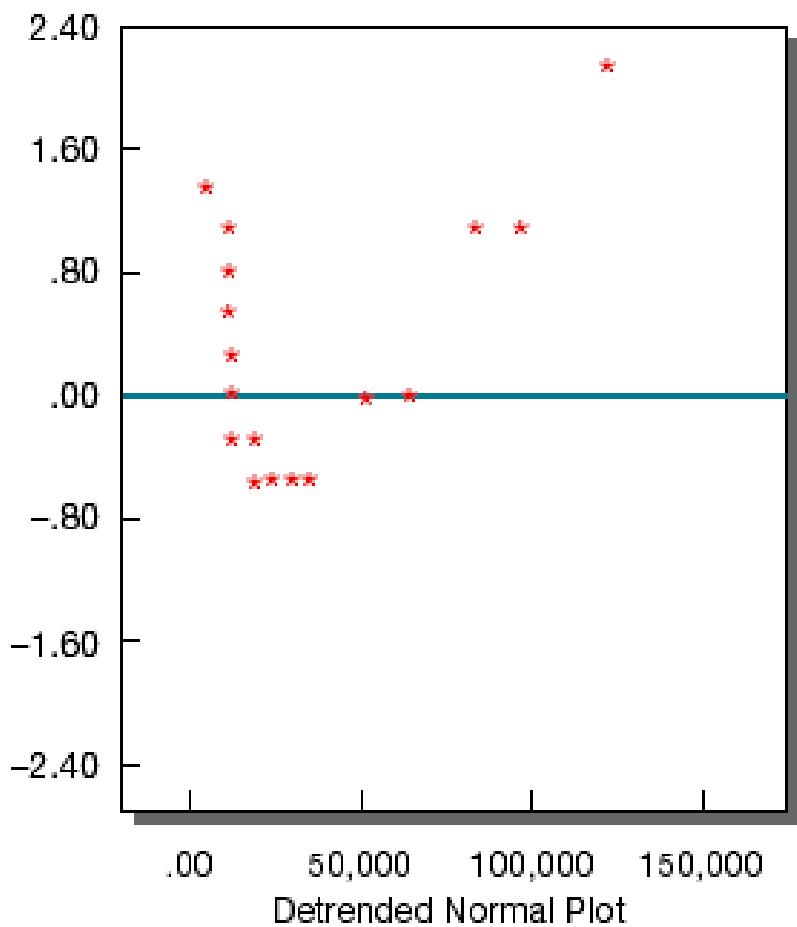
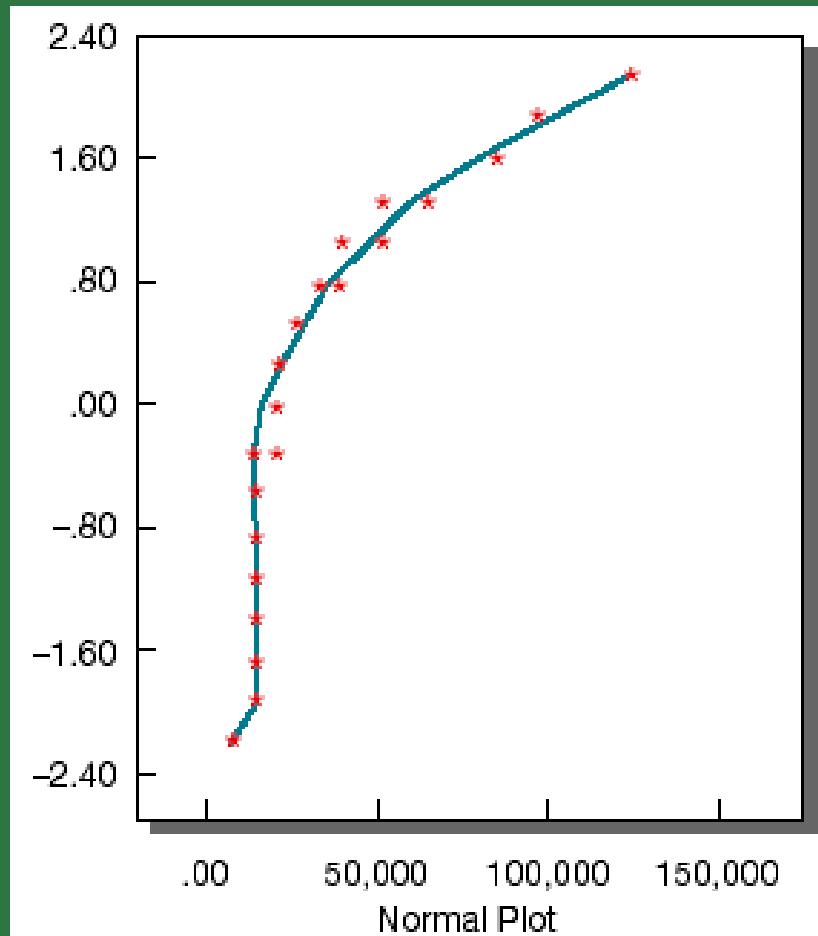
Probability Plot



Probability Plot



Probability Plot



Advantages of Nonparametric Tests

Easy to understand and use

Usable with nominal data

Appropriate for ordinal data

Appropriate for non-normal
population distributions



How to Select a Test

How many samples are involved?

If two or more samples are involved,
are the individual cases independent or related?

Is the measurement scale
nominal, ordinal, interval, or ratio?

Recommended Statistical Techniques

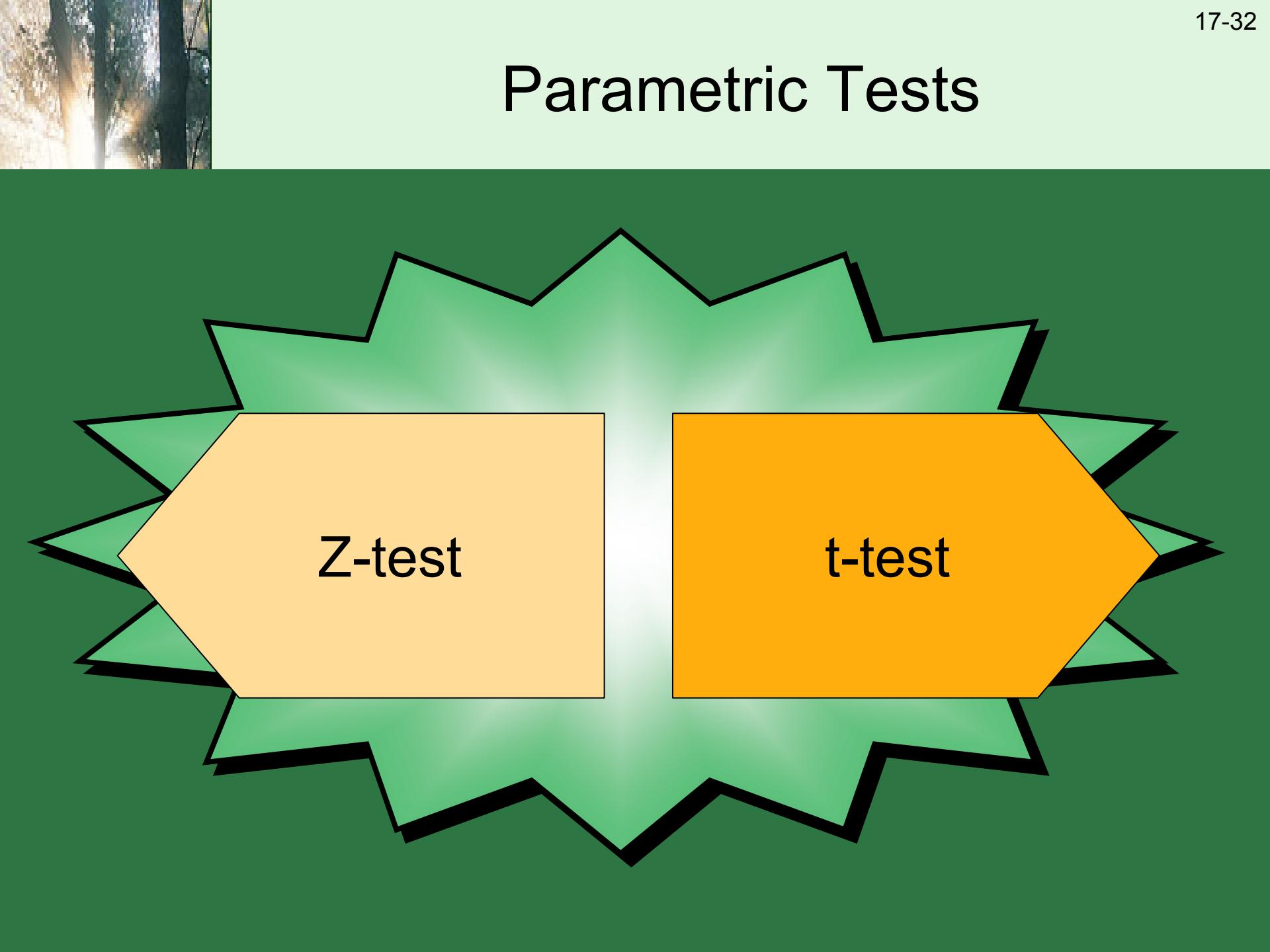
		Two-Sample Tests		<i>k</i> -Sample Tests	
Measurement Scale	One-Sample Case	Related Samples	Independent Samples	Related Samples	Independent Samples
Nominal	<ul style="list-style-type: none"> Binomial χ^2 one-sample test 	<ul style="list-style-type: none"> McNemar 	<ul style="list-style-type: none"> Fisher exact test χ^2 two-samples test 	<ul style="list-style-type: none"> Cochran Q 	<ul style="list-style-type: none"> χ^2 for <i>k</i> samples
Ordinal	<ul style="list-style-type: none"> Kolmogorov-Smirnov one-sample test Runs test 	<ul style="list-style-type: none"> Sign test Wilcoxon matched-pairs test 	<ul style="list-style-type: none"> Median test Mann-Whitney U Kolmogorov-Smirnov Wald-Wolfowitz 	<ul style="list-style-type: none"> Friedman two-way ANOVA 	<ul style="list-style-type: none"> Median extension Kruskal-Wallis one-way ANOVA
Interval and Ratio	<ul style="list-style-type: none"> <i>t</i>-test <i>Z</i> test 	<ul style="list-style-type: none"> <i>t</i>-test for paired samples 	<ul style="list-style-type: none"> <i>t</i>-test <i>Z</i> test 	<ul style="list-style-type: none"> Repeated-measures ANOVA 	<ul style="list-style-type: none"> One-way ANOVA <i>n</i>-way ANOVA



Questions Answered by One-Sample Tests

- Is there a difference between observed frequencies and the frequencies we would expect?
- Is there a difference between observed and expected proportions?
- Is there a significant difference between some measures of central tendency and the population parameter?

Parametric Tests



Z-test

t-test

One-Sample *t*-Test Example

Null	$H_0: \mu = 50 \text{ mpg}$
Statistical test	<i>t</i> -test
Significance level	.05, n=100
Calculated value	1.786
Critical test value	1.66 (from Appendix C, Exhibit C-2)

One Sample Chi-Square Test Example

Living Arrangement	Intend to Join	Number Interviewed	Percent (no. interviewed/200)	Expected Frequencies (percent x 60)
Dorm/fraternity	16	90	45	27
Apartment/rooming house, nearby	13	40	20	12
Apartment/rooming house, distant	16	40	20	12
Live at home	15	30	15	9
Total	60	200	100	60

One-Sample Chi-Square Example

Null	$H_0: O = E$
Statistical test	One-sample chi-square
Significance level	.05
Calculated value	9.89
Critical test value	7.82

(from Appendix C, Exhibit C-3)

Two-Sample Parametric Tests

$$Z = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)0}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$$t = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)0}{\sqrt{S_p^2 \frac{1}{n_1} + \frac{1}{n_2}}}$$

Two-Sample t-Test Example

	A Group	B Group
Average hourly sales	$X_1 = \$1,500$	$X_2 = \$1,300$
Standard deviation	$s_1 = 225$	$s_2 = 251$

Two-Sample t-Test Example

Null	$H_0: A \text{ sales} = B \text{ sales}$
Statistical test	t -test
Significance level	.05 (one-tailed)
Calculated value	1.97, d.f. = 20
Critical test value	1.725

Two-Sample Nonparametric Tests: Chi-Square

		On-the-Job-Accident		
	Cell Designation Count Expected Values	Yes	No	Row Total
Smoker	Heavy Smoker	1,1 12, 8.24	1,2 4 7.75	16
		2,1 9 7.73	2,2 6 7.27	
	Nonsmoker	3,1 13 18.03	3,2 22 16.97	35
Column Total		34	32	66

Two-Sample Chi-Square Example

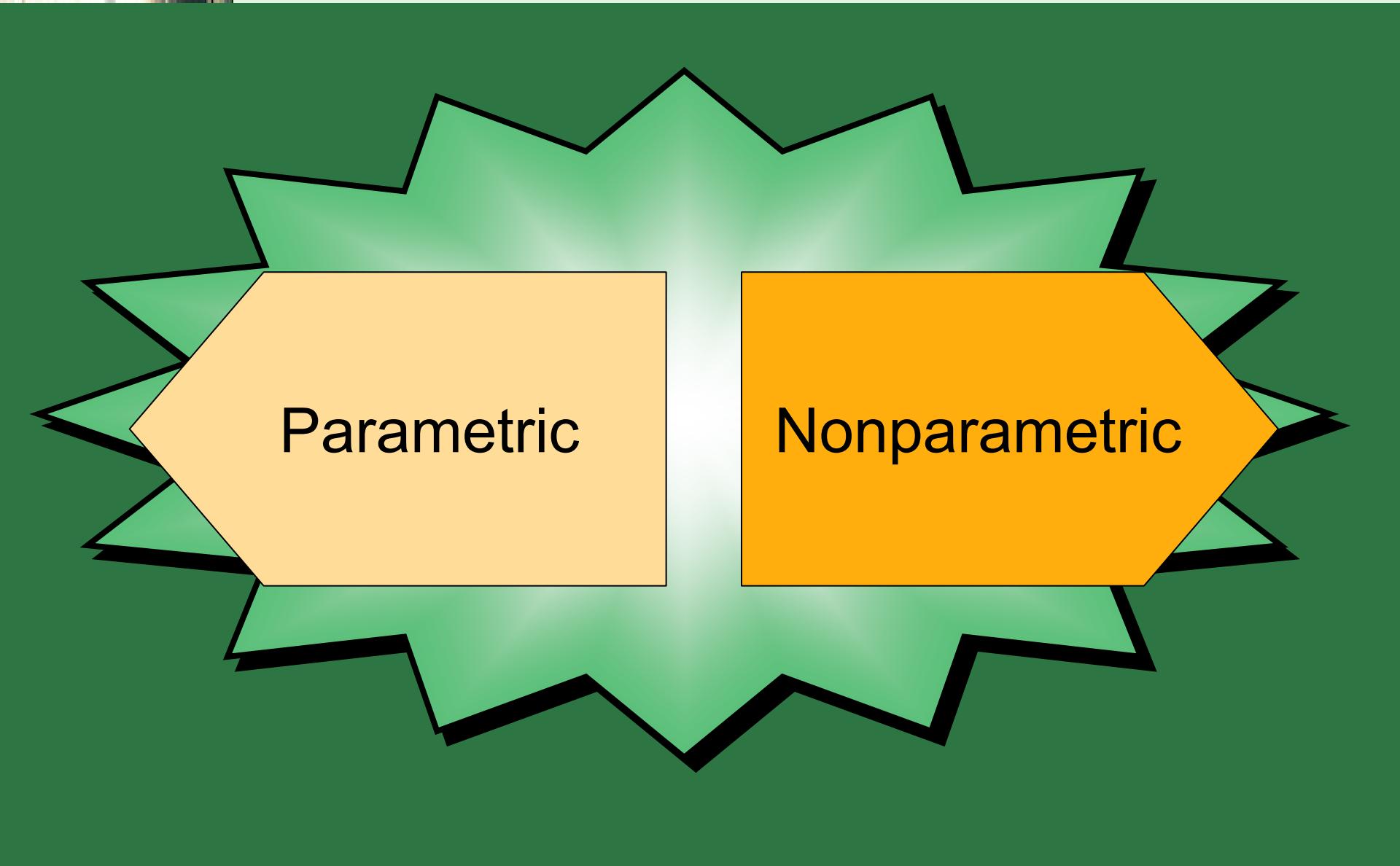
Null	There is no difference in distribution channel for age categories.
Statistical test	Chi-square
Significance level	.05
Calculated value	6.86, d.f. = 2
Critical test value	5.99

SPSS Cross-Tab Procedure

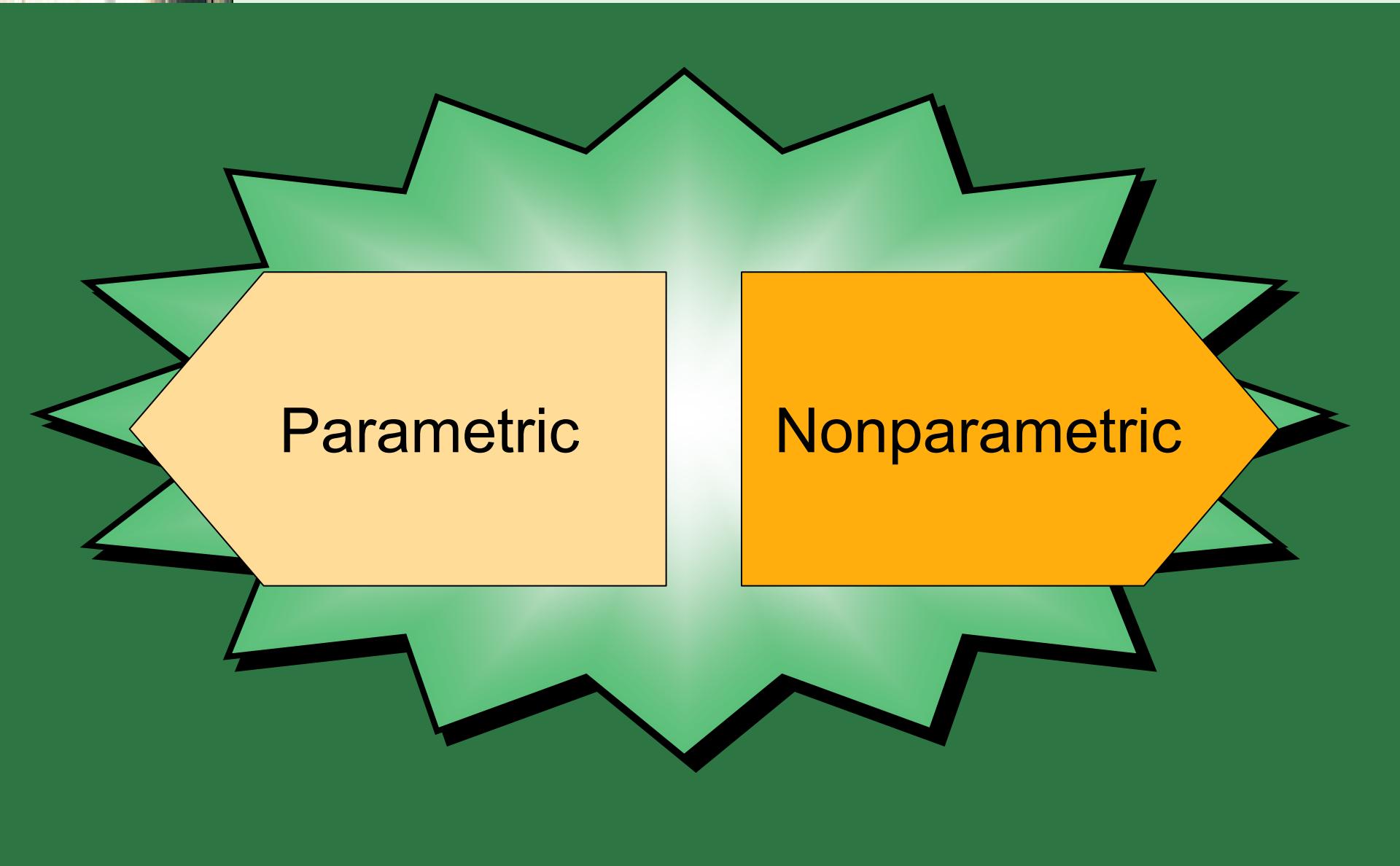
INCOME BY POSSESSION OF MBA			
INCOME	MBA		Row Total
	Yes 1	No 2	
High 1	30	30	60 60.0
Low 2	10	30	40 40.0
Column Total	40 40.0	60 60.0	100 100.0

Chi-Square	Value	D.F.	Significance
Pearson	6.25000	1	.01242
Continuity Correction	5.25174	1	.02192
Likelihood Ratio	6.43786	1	.01117
Mantel-Haenszel	6.18750	1	.01287
Minimum Expected Frequency:	16.000		

Two-Related-Samples Tests



Parametric



Nonparametric

Sales Data for Paired-Samples t-Test

Company	Sales Year 2	Sales Year 1	Difference D	D^2
GM	126932	123505	3427	11744329
GE	54574	49662	4912	24127744
Exxon	86656	78944	7712	59474944
IBM	62710	59512	3192	10227204
Ford	96146	92300	3846	14971716
AT&T	36112	35173	939	881721
Mobil	50220	48111	2109	4447881
DuPont	35099	32427	2632	6927424
Sears	53794	49975	3819	14584761
Amoco	23966	20779	3187	10156969
Total			$\Sigma D = 35781$	$\Sigma D^2 = 157364693$

Paired-Samples t-Test Example

Null	Year 1 sales = Year 2 sales
Statistical test	Paired sample t-test
Significance level	.01
Calculated value	6.28, d.f. = 9
Critical test value	3.25

(from Appendix C, Exhibit C-2)

SPSS Output for Paired-Samples *t*-Test

---*t*-tests for paired samples---

Variable	Number of Cases	Mean	Standard Deviation	Standard Error			
Year 2 Sales	10	62620.9	31777.649	10048.975			
Year 1 Sales	10	59038.8	31072.871	9836.104			
(Difference Mean)	Standard Deviation	Standard Error	Corr.	2-tail Prob.	<i>t</i> Value	Degrees of Freedom	2-tail Prob.
3582.1000	1803.159	570.209	.999	.000	6.28	9	.000

Related Samples Nonparametric Tests: McNemar Test

Before	After Do Not Favor	After Favor
Favor	A	B
Do Not Favor	C	D

Related Samples Nonparametric Tests: McNemar Test

Before	After Do Not Favor	After Favor
Favor	A=10	B=90
Do Not Favor	C=60	D=40

k-Independent-Samples Tests: ANOVA

- Tests the null hypothesis that the means of three or more populations are equal
- One-way: Uses a single-factor, fixed-effects model to compare the effects of a treatment or factor on a continuous dependent variable

ANOVA Example

Model Summary					
Source	d.f.	Sum of Squares	Mean Square	F Value	p Value
Model (airline)	2	11644.033	5822.017	28.304	0.0001
Residual (error)	57	11724.550	205.694		
Total	59	23368.583			

	Means Table			
	Count	Mean	Std. Dev.	Std. Error
Lufthansa	20	38.950	14.006	3.132
Malaysia Airlines	20	58.900	15.089	3.374
Cathay Pacific	20	72.900	13.902	3.108

All data are hypothetical

ANOVA Example Continued

Null	$\mu A1 = \mu A2 = \mu A3$
Statistical test	ANOVA and F ratio
Significance level	.05
Calculated value	28.304, d.f. = 2, 57
Critical test value	3.16

(from Appendix C, Exhibit C-9)

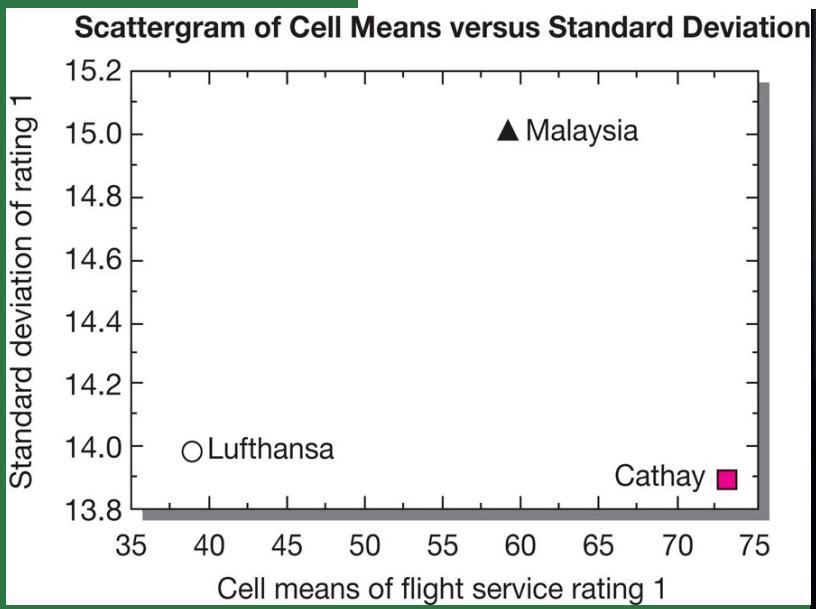
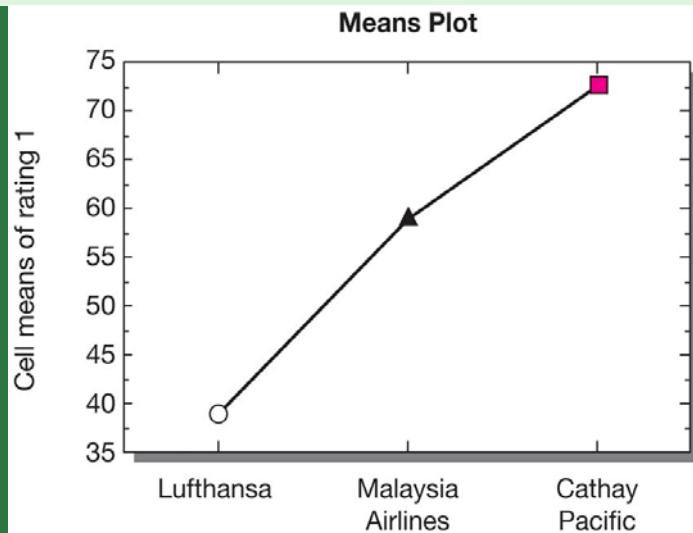
Post Hoc: Scheffe's S Multiple Comparison Procedure

	Verses	Diff	Crit. Diff.	p Value
Lufthansa	Malaysia Airlines	19,950	11.400	.0002
	Cathay Pacific	33.950	11.400	.0001
Malaysia Airlines	Cathay Pacific	14.000	11.400	.0122

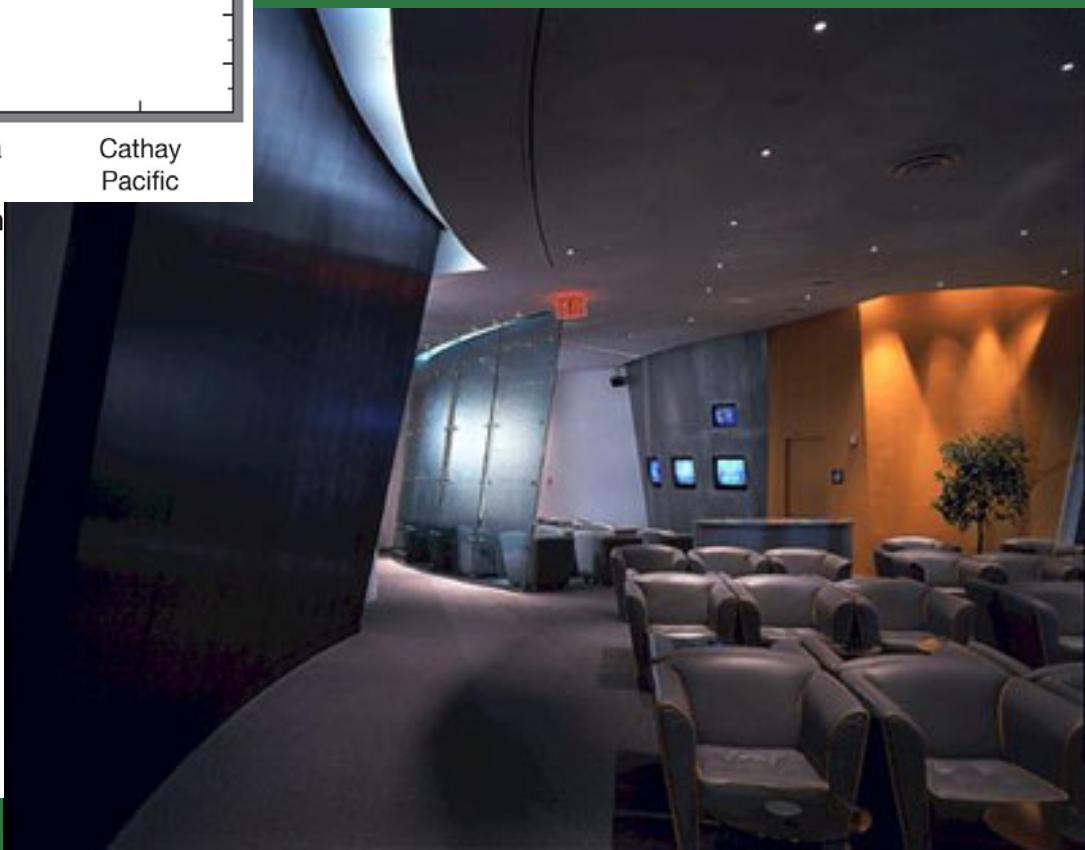
Multiple Comparison Procedures

Test	Complex Comparisons	Pairwise Comparisons	Equal <i>n</i> 's Only	Unequal <i>n</i> 's	Equal Variances Assumed	Unequal Variances Not Assumed
Fisher LSD	X			X	X	
Bonferroni	X		X	X		
Tukey HSD	X		X		X	
Tukey-Kramer	X			X	X	
Games-Howell	X			X		X
Tamhane T2	X			X		X
Scheffé S		X	X	X	X	
Brown-Forsythe		X	X	X		X
Newman-Keuls	X				X	
Duncan	X				X	
Dunnet's T3						X
Dunnet's C						X

ANOVA Plots



Lufthansa Business Class Lounge



Two-Way ANOVA Example

Model Summary					
Source	d.f.	Sum of Squares	Mean Square	F Value	p Value
Airline	2	11644.033	5822.017	39.178	0.0001
Seat selection	1	3182.817	3182.817	21.418	0.0001
Airline by seat selection	2	517.033	258.517	1.740	0.1853
Residual	54	8024.700	148.606		

	Means Table Effect: Airline by Seat Selection				
	Count	Mean	Std. Dev.	Std. Error	
Lufthansa economy	10	35.600	12.140	3.839	
Lufthansa business	10	42.300	15.550	4.917	
Malaysia Airlines economy	10	48.500	12.501	3.953	
Malaysia Airlines business	10	69.300	9.166	2.898	
Cathay Pacific economy	10	64.800	13.037	4.123	
Cathay Pacific business	10	81.000	9.603	3.037	

k-Related-Samples Tests

More than two levels in grouping factor

Observations are matched

Data are interval or ratio

Repeated-Measures ANOVA Example

Model Summary					
Source	d.f.	Sum of Squares	Mean Square	F Value	p Value
Airline	2	3552735.50	17763.775	67.199	0.0001
Subject (group)	57	15067.650	264.345		
Ratings	1	625.633	625.633	14.318	0.0004
Ratings by air.....	2	2061.717	1030.858	23.592	0.0001
Ratings by subj.....	57	2490.650	43.696		

Means Table by Airline					
	Count	Mean	Std. Dev.	Std. Error	
Rating 1, Lufthansa	20	38.950	14.006	3.132	
Rating 1, Malaysia Airlines	20	58.900	15.089	3.374	
Rating 1, Cathay Pacific	20	72.900	13.902	3.108	
Rating 2, Lufthansa	20	32.400	8.268	1.849	
Rating 2, Malaysia Airlines	20	72.250	10.572	2.364	
Rating 2, Cathay Pacific	20	79.800	11.265	2.519	

Means Table Effect: Ratings					
	Count	Mean	Std. Dev.	Std. Error	
Rating 1	60	56.917	19.902	2.569	
Rating 2	60	61.483	23.208	2.996	

All data are hypothetical.

Key Terms

- a priori contrasts
- Alternative hypothesis
- Analysis of variance (ANOVA)
- Bayesian statistics
- Chi-square test
- Classical statistics
- Critical value
- F ratio
- Inferential statistics
- K-independent-samples tests
- K-related-samples tests
- Level of significance
- Mean square
- Multiple comparison tests (range tests)
- Nonparametric tests
- Normal probability plot

Key Terms

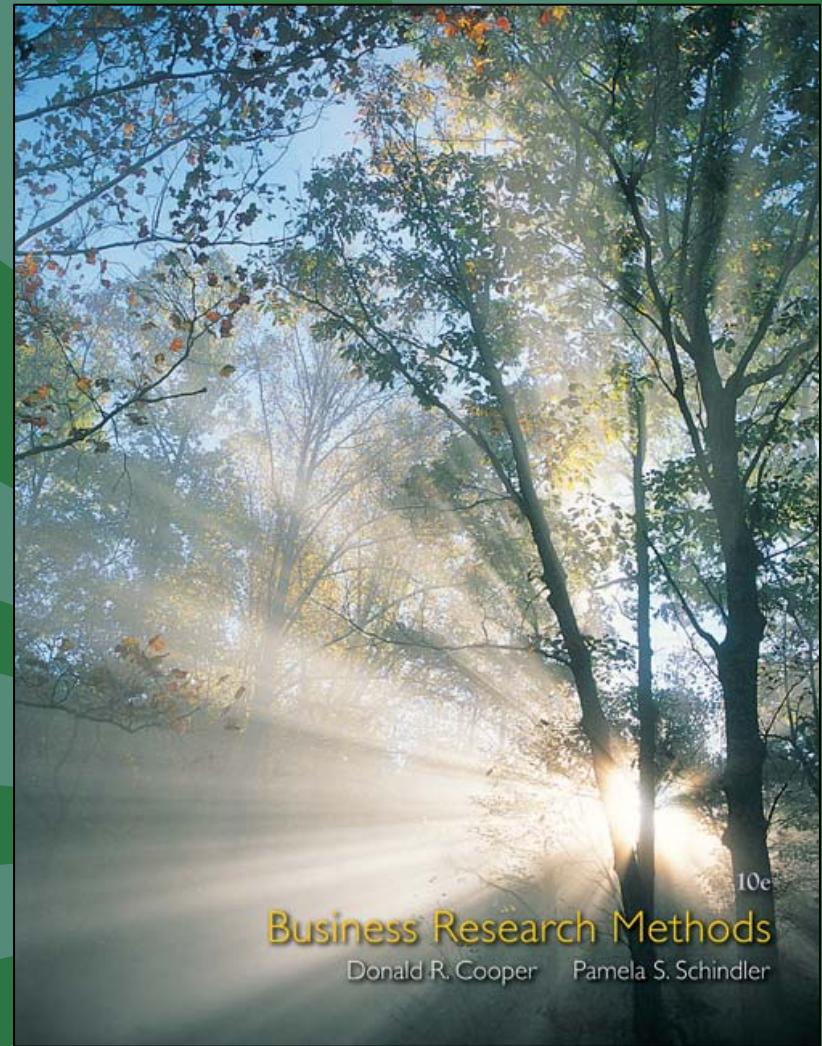
- Null hypothesis
- Observed significance level
- One-sample tests
- One-tailed test
- p value
- Parametric tests
- Power of the test
- Practical significance
- Region of acceptance
- Region of rejection
- Statistical significance
- t distribution
- Trials
- t-test
- Two-independent-samples tests

Key Terms

- Two-related-samples tests
- Two-tailed test
- Type I error
- Type II error
- Z distribution
- Z test

Chapter 18

Measures of Association





Learning Objectives

Understand . . .

- How correlation analysis may be applied to study relationships between two or more variables
- The uses, requirements, and interpretation of the product moment correlation coefficient.
- How predictions are made with regression analysis using the method of least squares to minimize errors in drawing a line of best fit.



Learning Objectives

Understand . . .

- How to test regression models for linearity and whether the equation is effective in fitting the data.
- Nonparametric measures of association and the alternatives they offer when key assumptions and requirements for parametric techniques cannot be met.

PulsePoint: Research Revelation

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The minimum average annual percentage profit increase created by a 5% customer loyalty increase.

Connections and Disconnections

“To truly understand consumers’ motives and actions, you must determine relationships between what they think and feel and what they actually do.”

**David Singleton, vp of insights
Zyman Marketing Group**

Measures of Association: Interval/Ratio

Pearson correlation coefficient	For continuous linearly related variables
Correlation ratio (eta)	For nonlinear data or relating a main effect to a continuous dependent variable
Biserial	One continuous and one dichotomous variable with an underlying normal distribution
Partial correlation	Three variables; relating two with the third's effect taken out
Multiple correlation	Three variables; relating one variable with two others
Bivariate linear regression	Predicting one variable from another's scores

Measures of Association: Ordinal

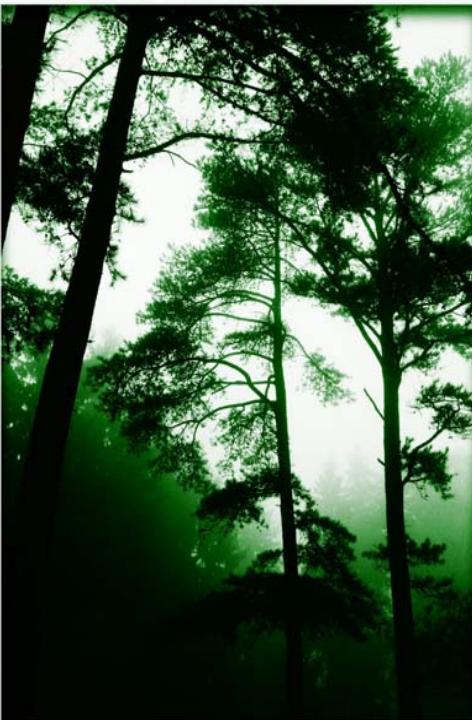
Gamma	Based on concordant-discordant pairs; proportional reduction in error (PRE) interpretation
Kendall's tau b	P-Q based; adjustment for tied ranks
Kendall's tau c	P-Q based; adjustment for table dimensions
Somers's d	P-Q based; asymmetrical extension of gamma
Spearman's rho	Product moment correlation for ranked data

Measures of Association: Nominal

Phi	Chi-square based for 2*2 tables
Cramer's V	CS based; adjustment when one table dimension >2
Contingency coefficient C	CS based; flexible data and distribution assumptions
Lambda	PRE based interpretation
Goodman & Kruskal's tau	PRE based with table marginals emphasis
Uncertainty coefficient	Useful for multidimensional tables
Kappa	Agreement measure

Researchers Search for Insights

In the fine art of research,
the shades of gray complete the masterpiece.



Burke, one of the world's leading research companies, claims researchers add the most value to a project when they look beyond the raw numbers to the shades of gray...what the data mean.

While data gives answers in black and white, it's the subtleties of the gray areas that give you the big picture. Burke understands the nuances of research. Founded in academic principles and guided by ongoing internal research, Burke helps you determine the best research method, gather the information, and develop the best strategy for actionable results. You will have confidence in your decisions because you have the experts at Burke to support you. Visit Burke.com or call 800.688.2674 to find out more.



The Fine Art of Marketing Research

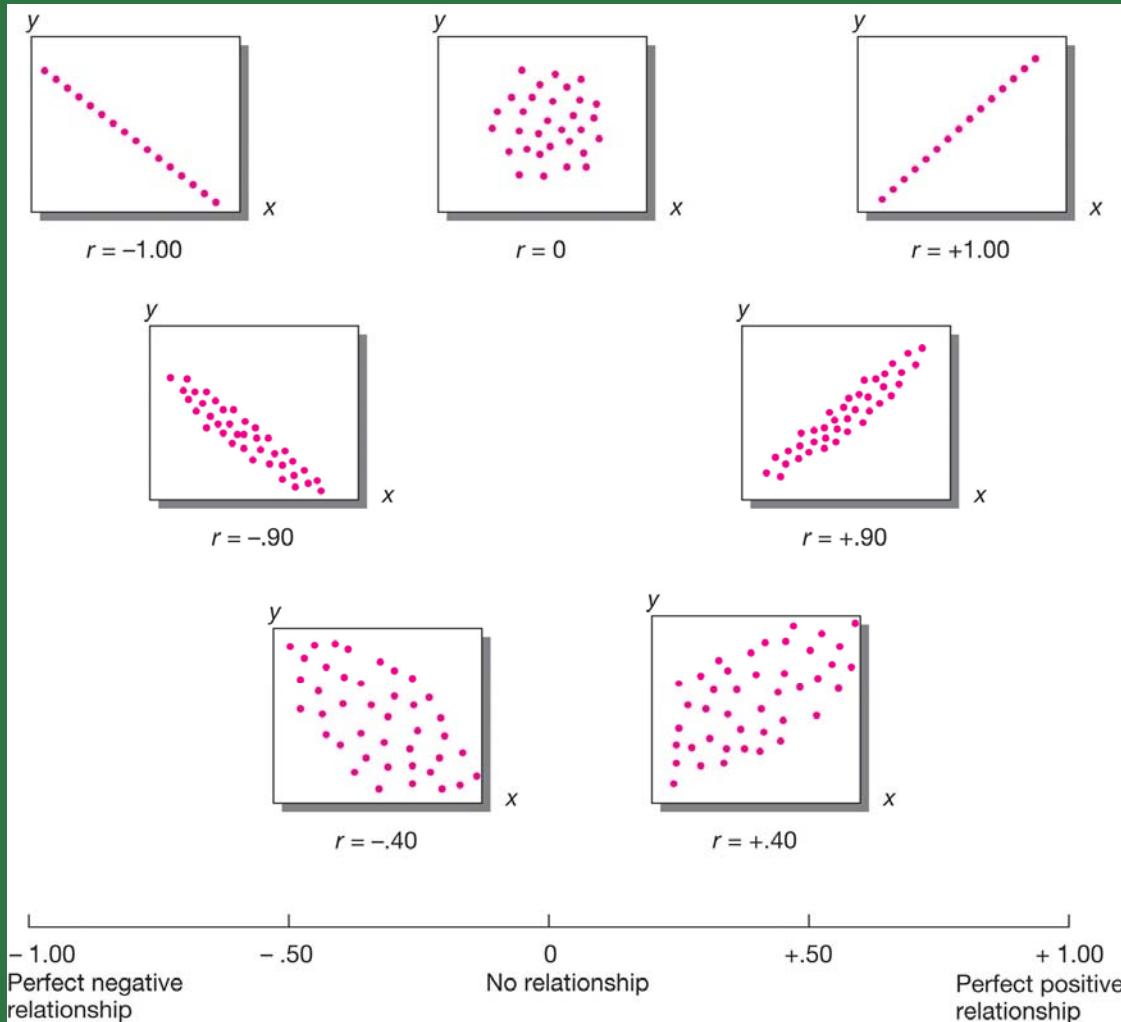
Pearson's Product Moment Correlation r

Is there a relationship between X and Y?

What is the magnitude of the relationship?

What is the direction of the relationship?

Scatterplots of Relationships



Scatterplots

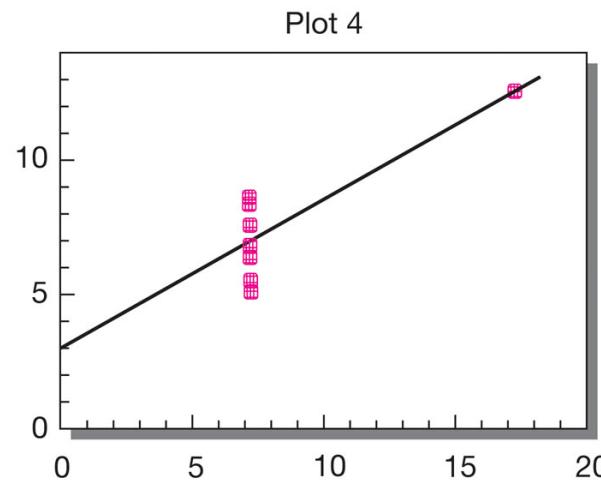
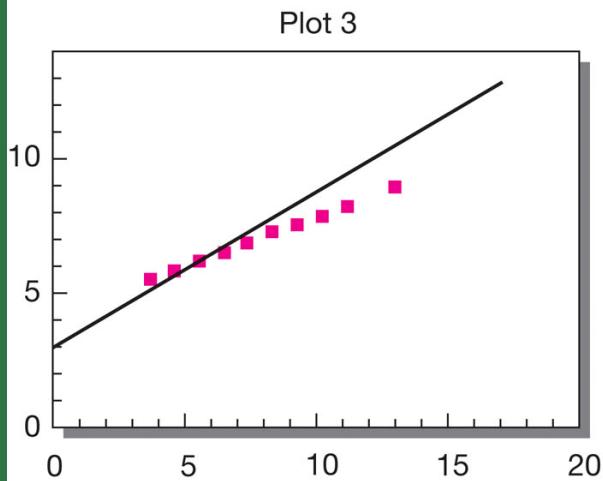
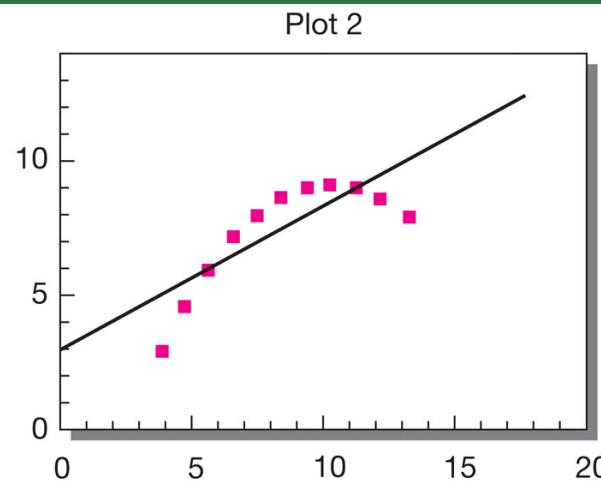
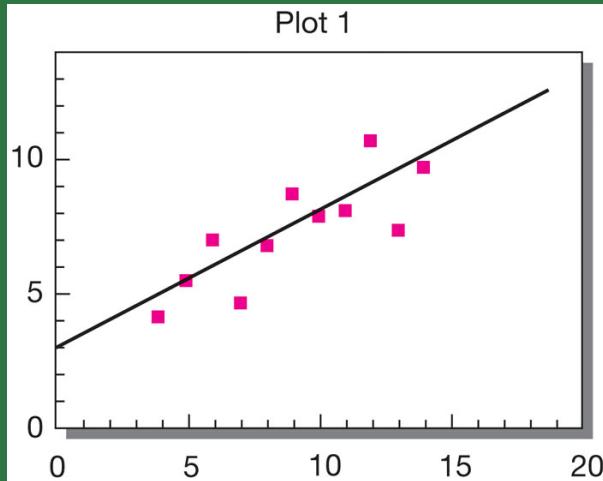
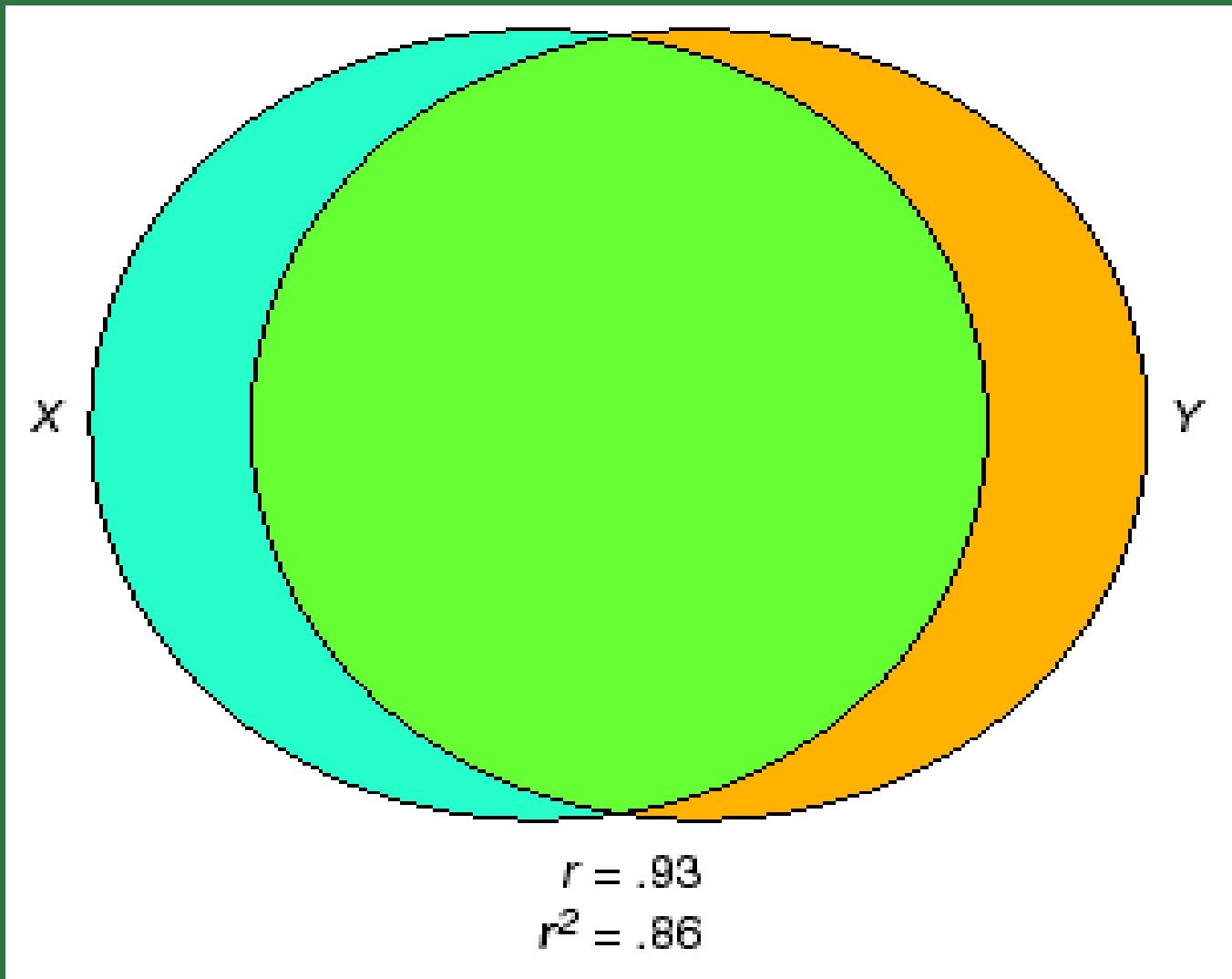


Diagram of Common Variance



Interpretation of Correlations

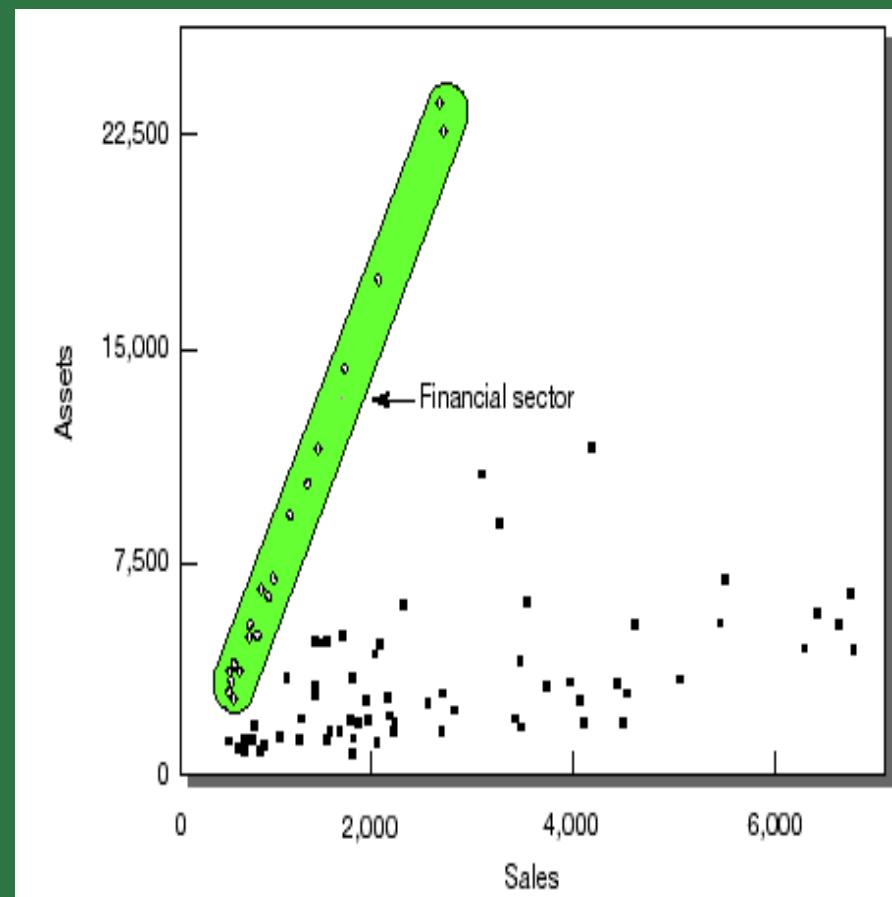
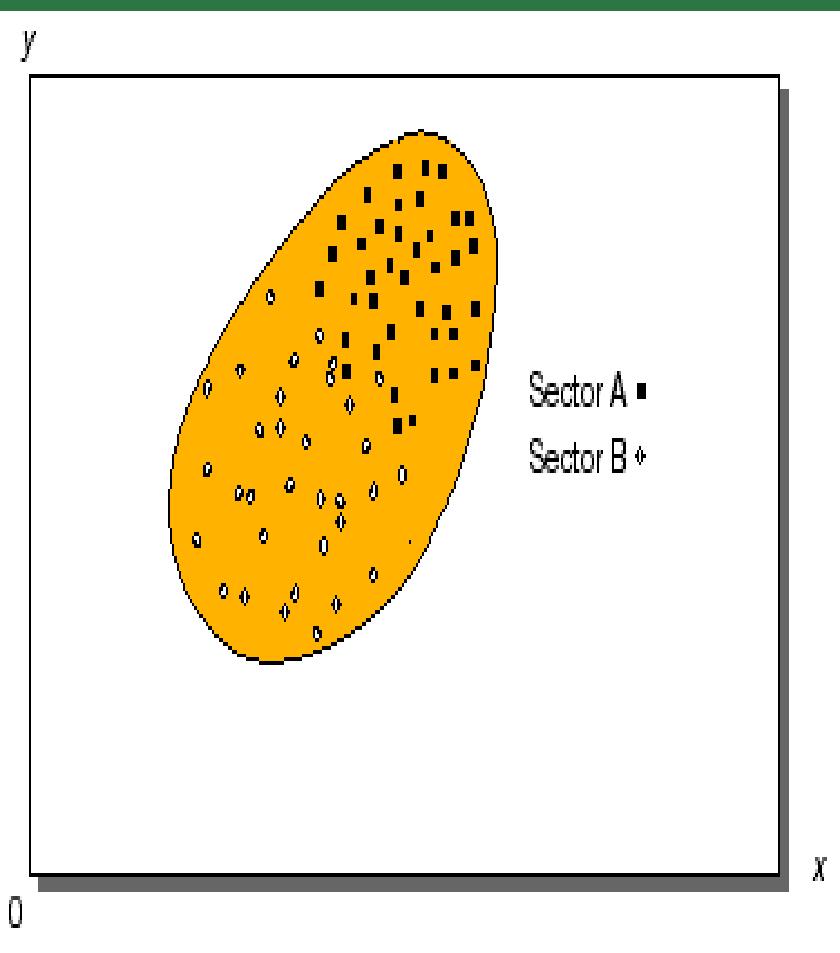
X causes Y

Y causes X

X and Y are activated by
one or more other variables

X and Y influence each
other reciprocally

Artifact Correlations



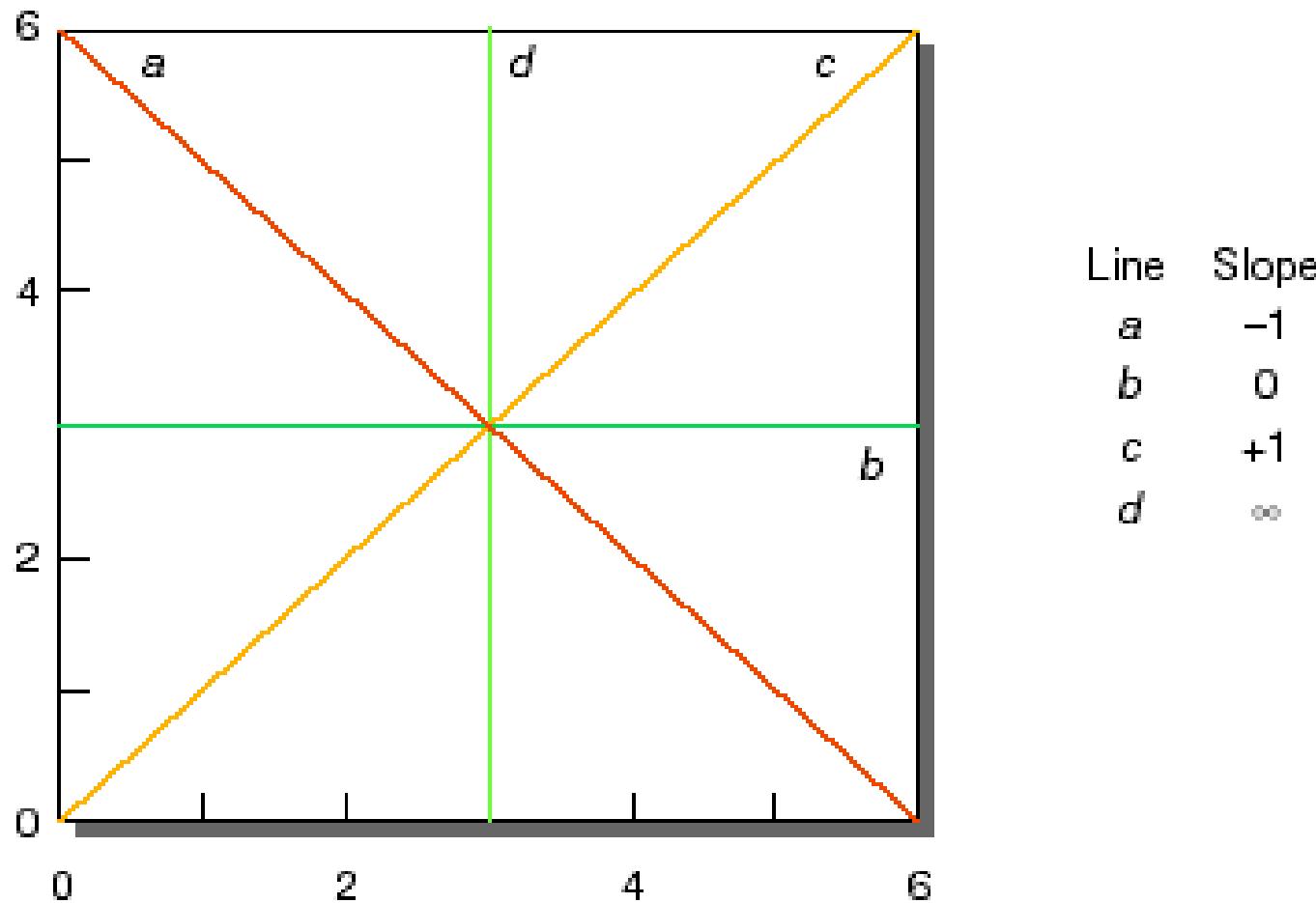
Interpretation of Coefficients

A coefficient is not remarkable simply because it is statistically significant! It must be practically meaningful.

Comparison of Bivariate Linear Correlation and Regression

	Correlation	Regression
Measurement level	Interval or ratio scale	Interval or ratio scale
Nature of variables	Both continuous, linearly related	Both continuous, linearly related
$X - Y$ relationship	X and Y are symmetric; $r_{xy} = r_{yx}$	Y is dependent, X is independent; regression of X on Y differs from Y on X
Correlation	The correlation of x and y produces an estimate of linear association based on sampling data	Correlation of $Y - X$ is the same as the correlation between the predicted values of Y and observed values of Y
Coefficient of determination	Explains common variance of X and Y	Proportion of variability of Y explained by its least-squares regression on X

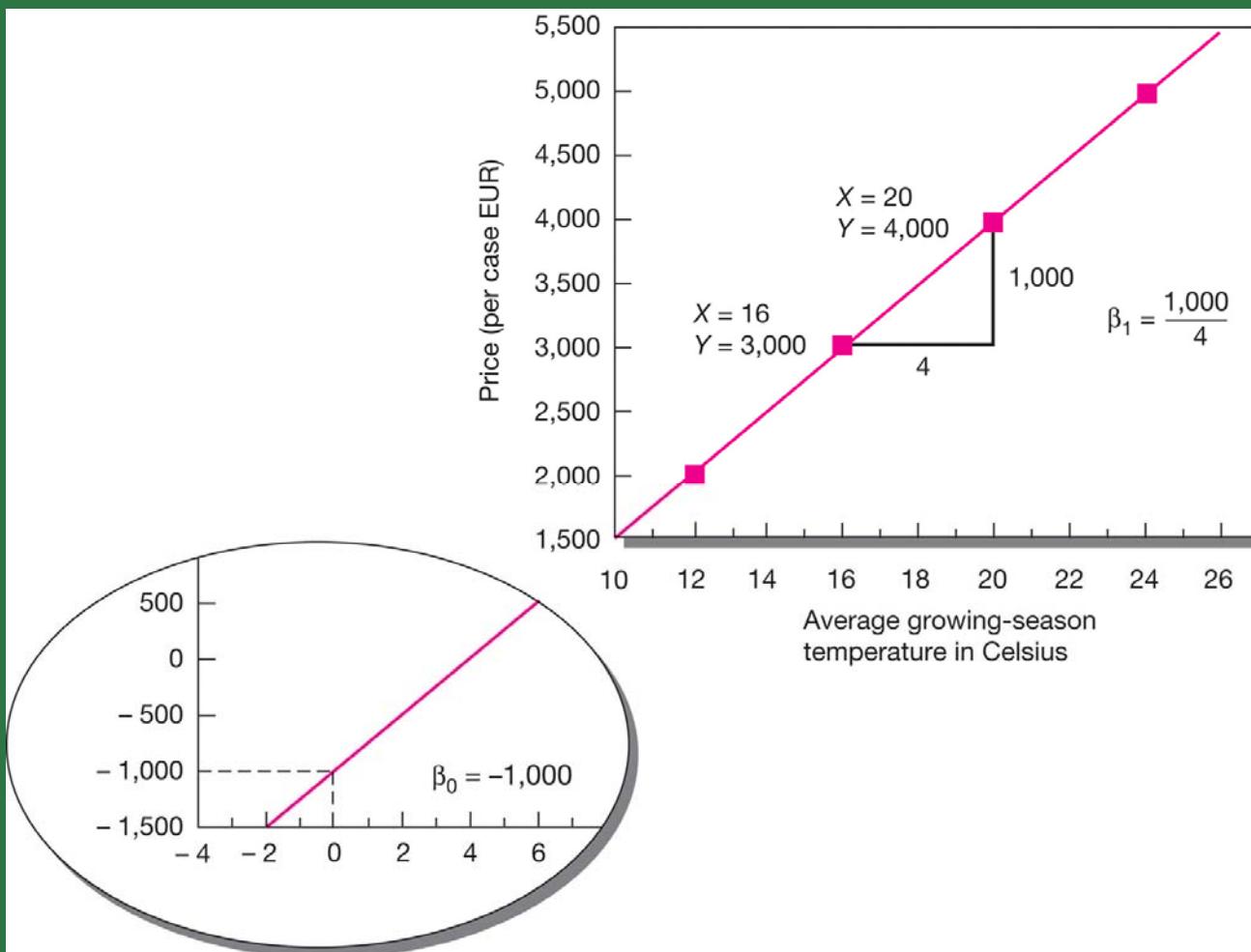
Examples of Different Slopes



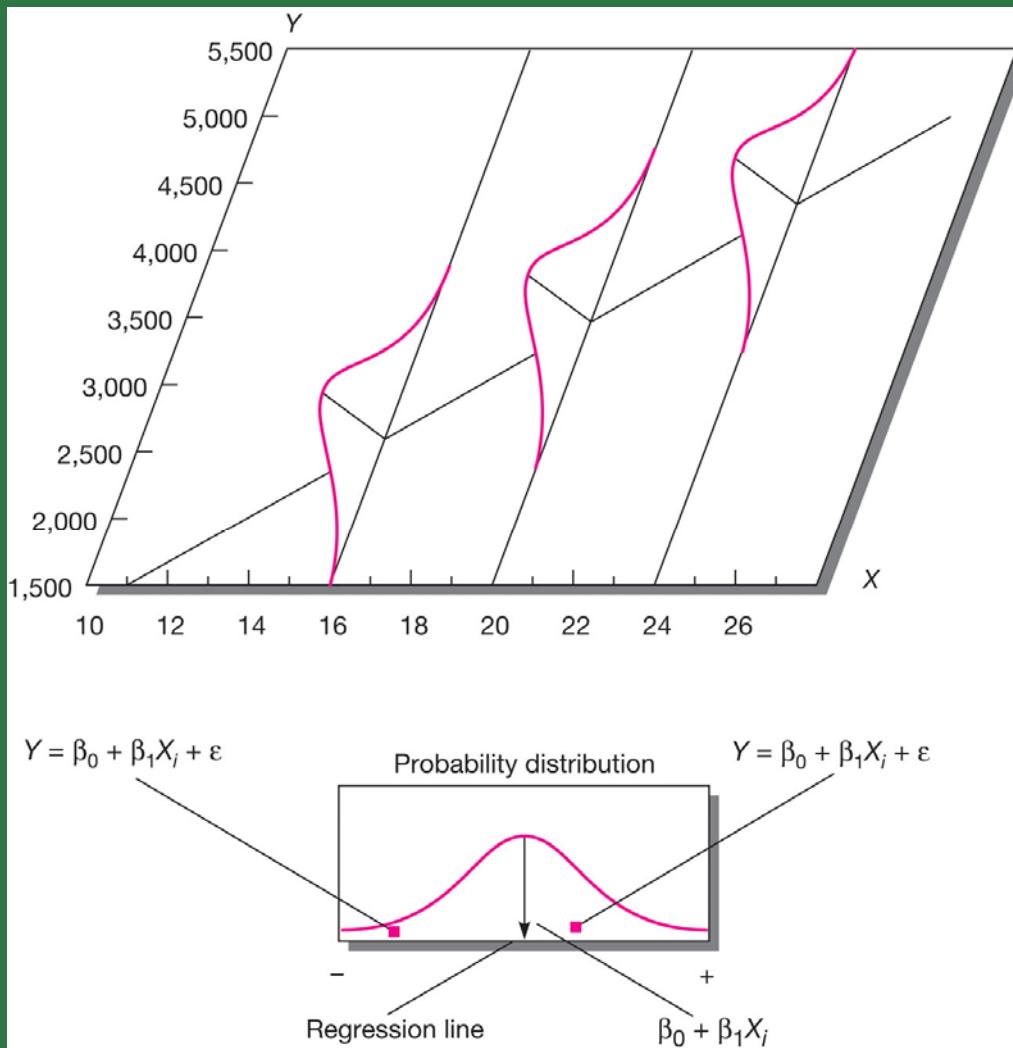
Concept Application

X	Y
Average Temperature (Celsius)	Price per Case (FF)
12	2,000
16	3,000
20	4,000
24	5,000
Mean =18	Mean = 3,500

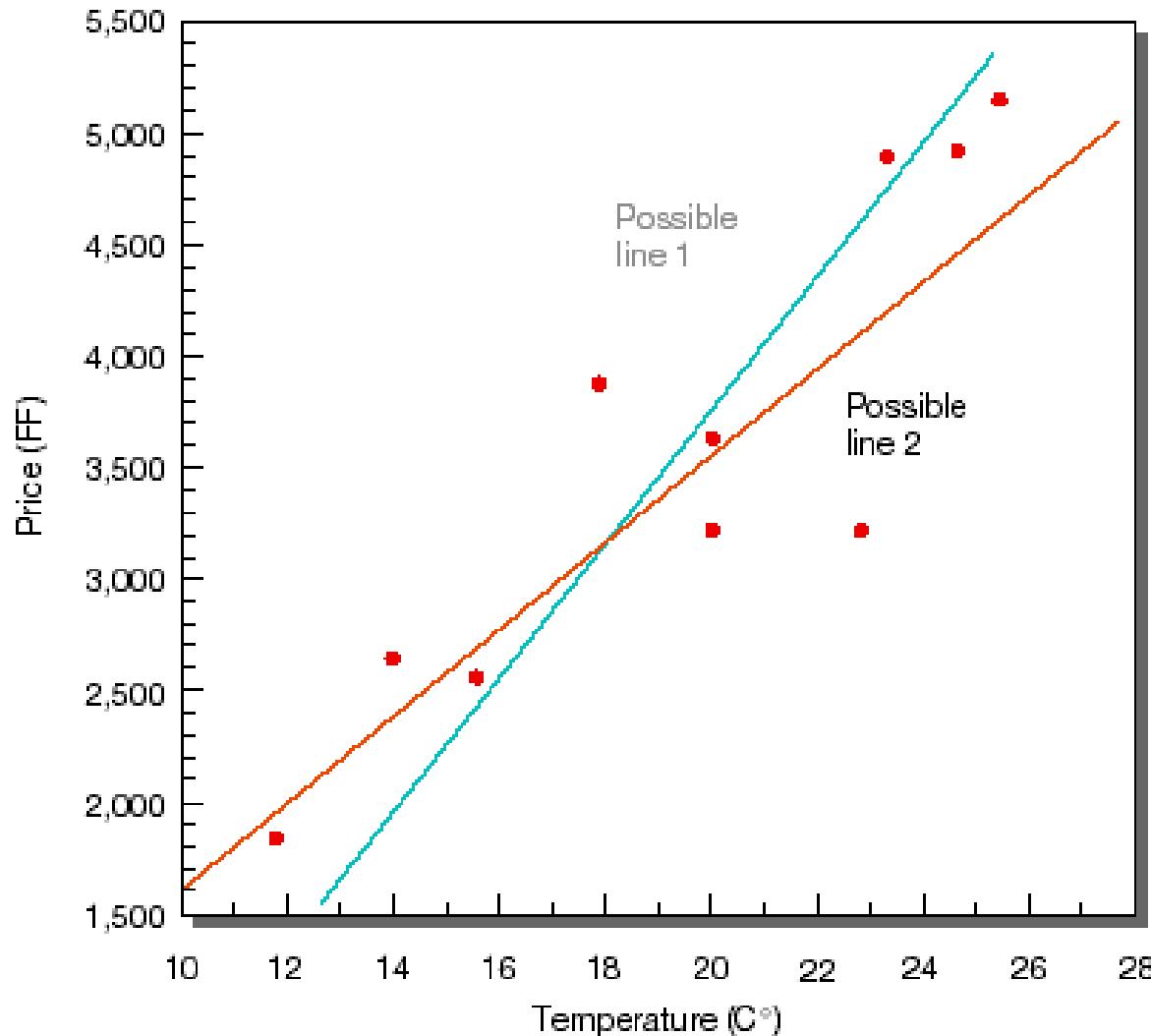
Plot of Wine Price by Average Temperature



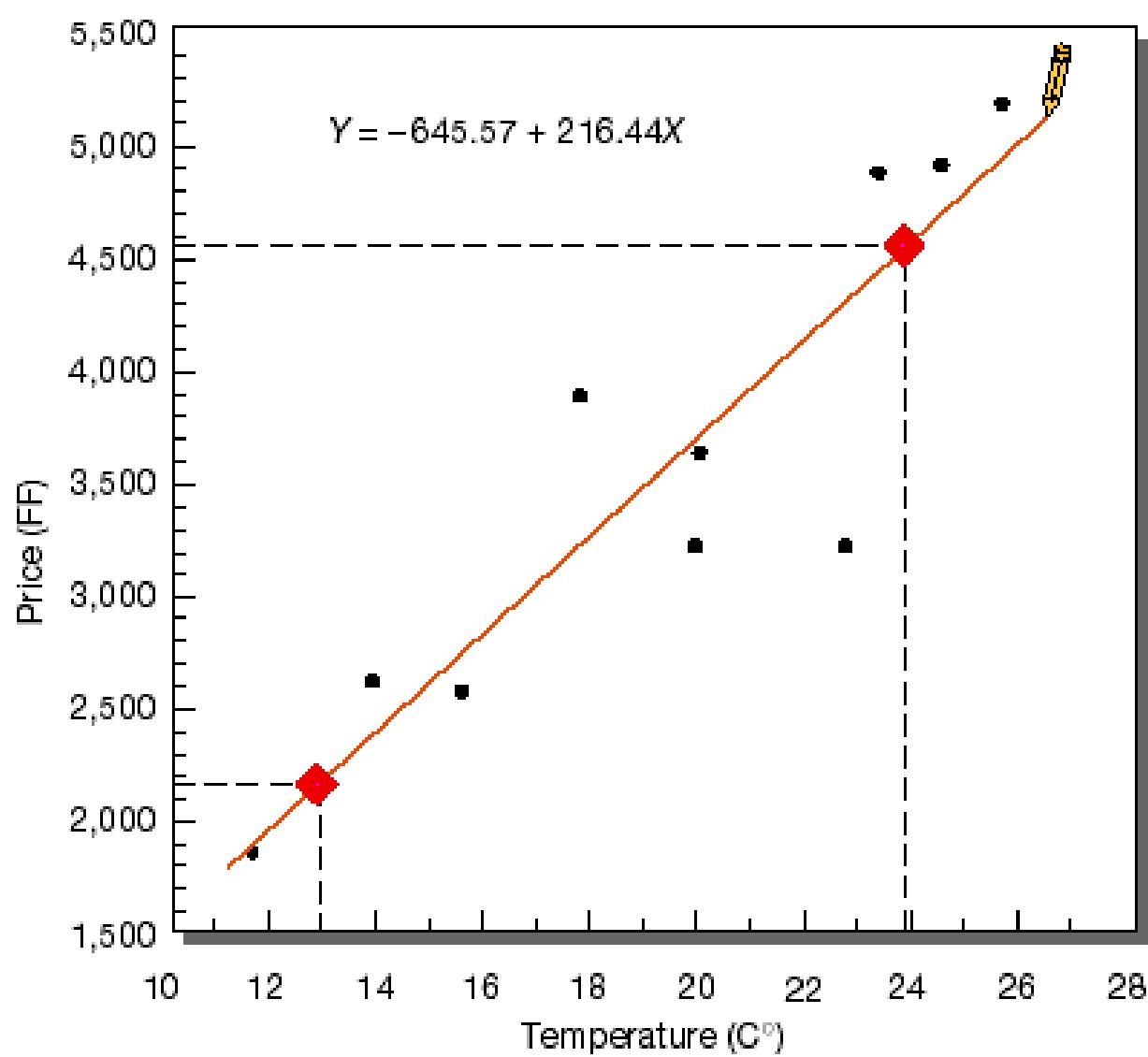
Distribution of Y for Observation of X



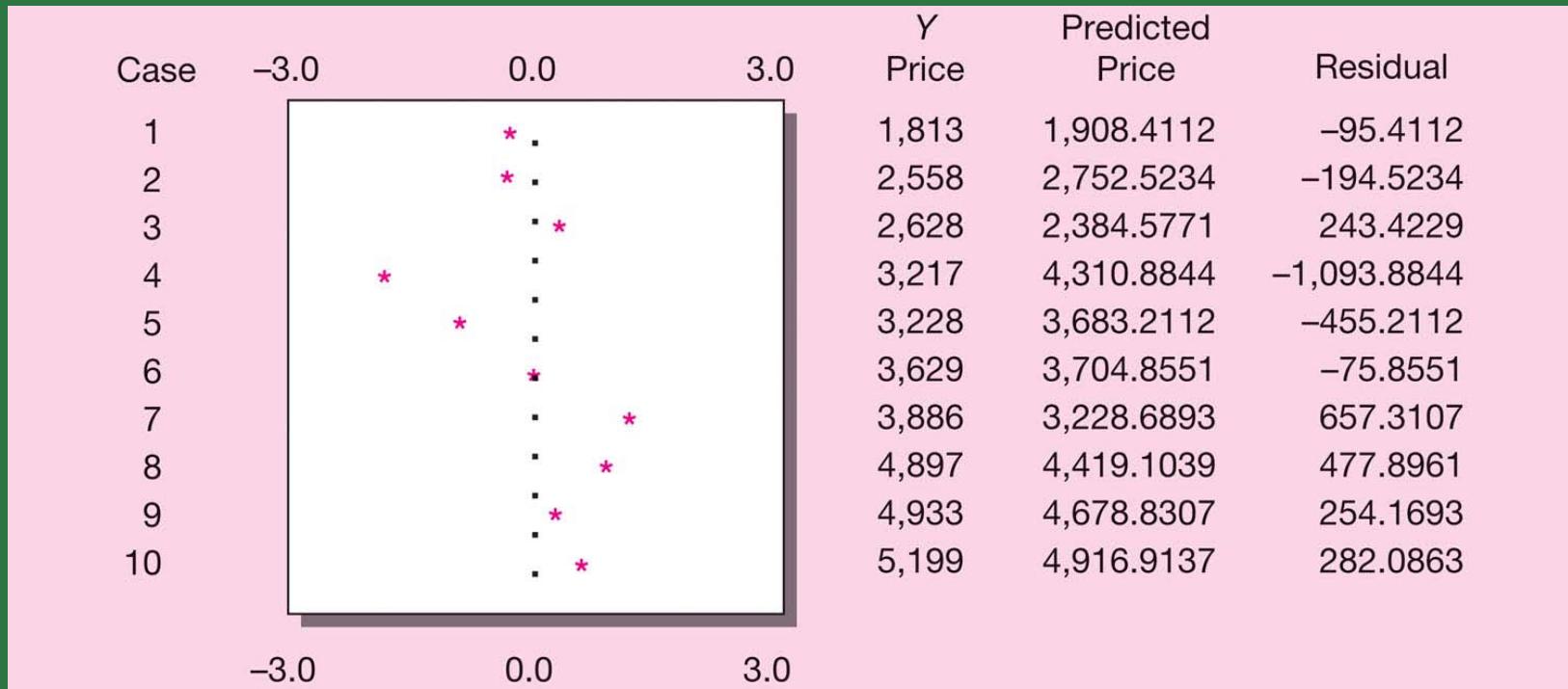
Wine Price Study Example



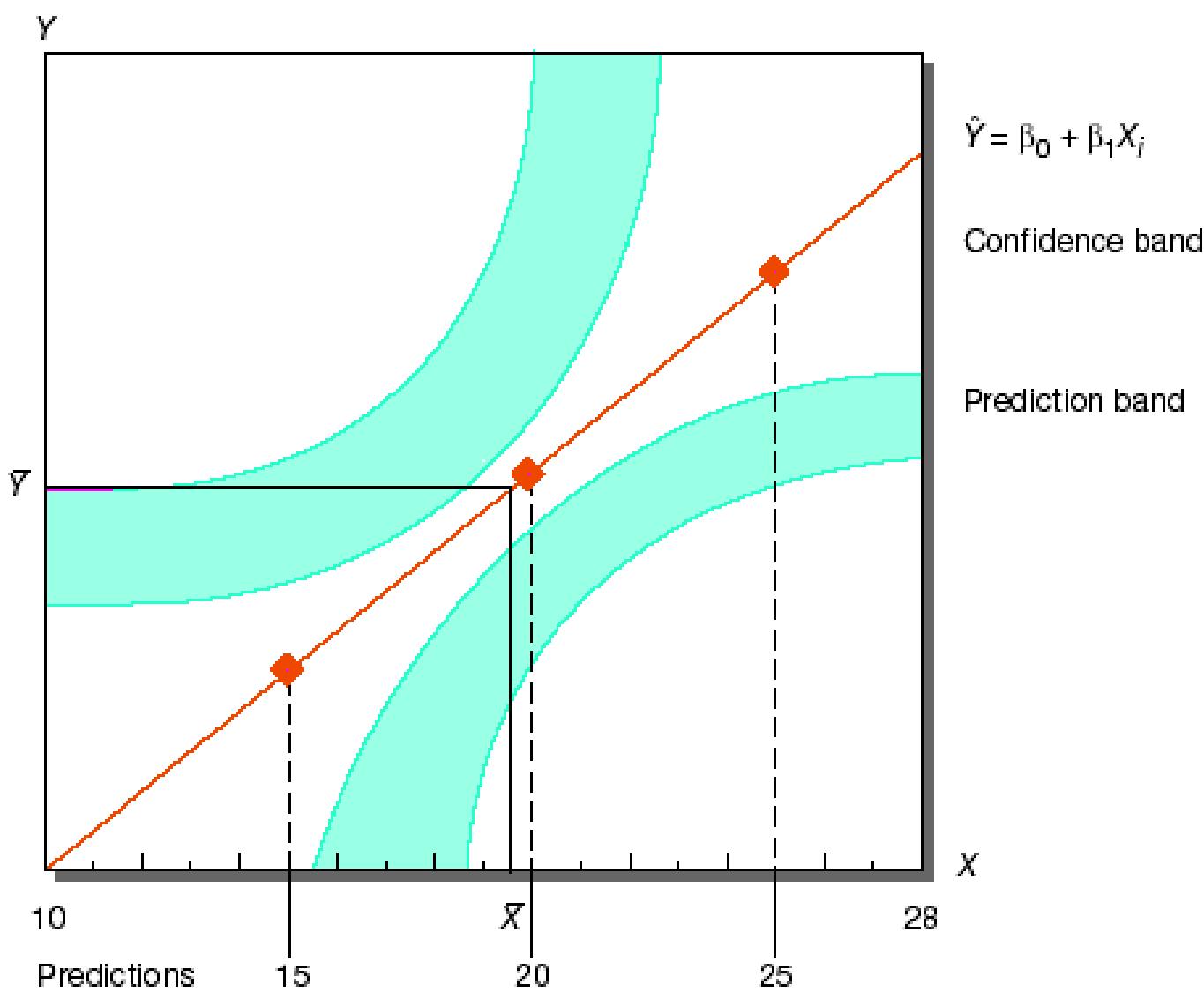
Least Squares Line: Wine Price Study



Plot of Standardized Residuals



Prediction and Confidence Bands



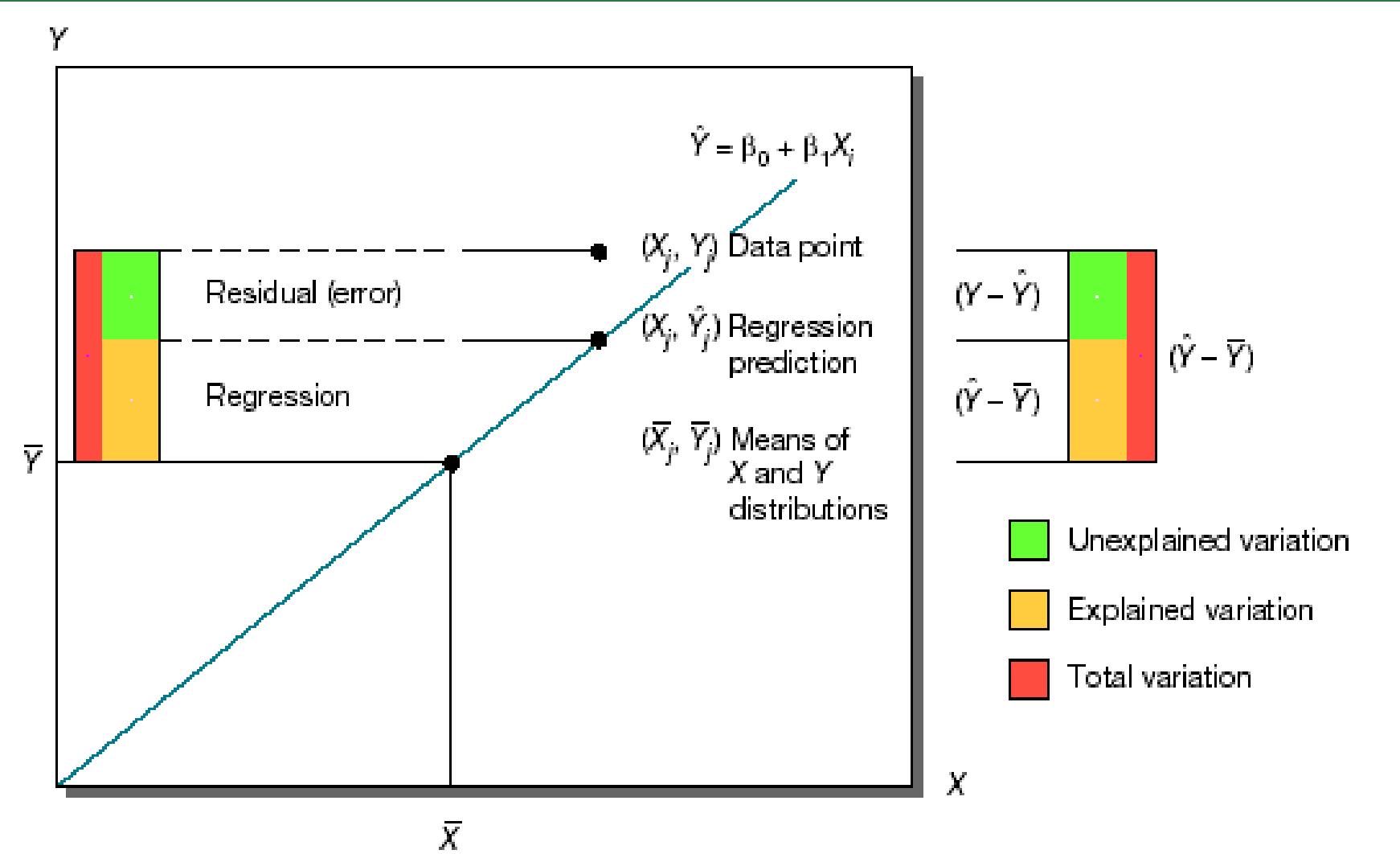
Testing Goodness of Fit

Y is completely unrelated to X
and no systematic pattern is evident

There are constant values of
Y for every value of X

The data are related but
represented by a nonlinear function

Components of Variation



F Ratio in Regression

ANOVA Summary Table: Test of Regression Model

Source	Degrees of Freedom	Sum of Squares	Mean Square	F Ratio
Regression	1	9,287,143.11	9,287,143.11	32.02
Residual (error)	8	2,320,368.49	290,046.06	
Total		11,607,511.60		

Significance of $F = .0005$

Coefficient of Determination: r^2

Total proportion of variance in Y
explained by X

Desired r^2 : 80% or more

Chi-Square Based Measures

		Marketing Campaign Success		Row Total
		Count	Yes	
Direct Mail	Yes	21	10	31
	No	13	22	35
		Column Total	34	32
				66
Chi-Square		Value	d.f.	Significance
Pearson		6.16257	1	.01305
Continuity correction		4.99836	1	.02537
Minimal expected frequency 15.030				
Statistic		Value	Approximate Significance	
Phi		.30557	.01305*	
Cramer's V		.30557	.01305*	
Contingency coefficient C		.29223	.01305*	
*Pearson chi-square probability.				

Proportional Reduction of Error Measures

What is your opinion about capping executives' salaries?

		Cell designation Count Row Pct.	Favor	Do Not Favor	Row Total	
Occupational Class	Managerial	1,1	1,2	110		
		90	20			
		82.0	18.0			
	White collar	2,1	2,2	140		
		60	80			
		43.0	57.0			
	Blue collar	3,1	3,2	150		
		30	120			
		20.0	80.0			
		Column Total	180	220	400	
			45.0%	55.0%	100.0%	
Chi-Square		Value	d.f.	Significance		
Pearson		98.38646	2	.00000		
Likelihood ratio		104.96542	2	.00000		
Minimum expected frequency 49.500						
Statistic		Value	ASEI	T Value	Approximate Significance	
Lambda:						
Symmetric		.30233	.03955	6.77902		
With occupation dependent		.24000	.03820	5.69495		
With opinion dependent		.38889	.04555	7.08010		
Goodman & Kruskal tau:						
With occupation dependent		.11669	.02076		.00000*	
With opinion dependent		.24597	.03979		.00000*	

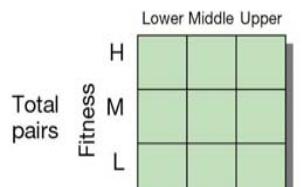
*Based on chi-square approximation.

Statistical Alternatives for Ordinal Measures

		Management Level			
Count		Lower	Middle	Upper	
Fitness	High	14	4	2	20
	Moderate	18	6	2	26
	Low	2	6	16	24
		34	16	20	70
Statistic		Value [*]			
Gamma		-.70			
Kendall's tau <i>b</i>		-.51			
Kendall's tau <i>c</i>		-.50			
Somers's <i>d</i>					
Symmetric		-.51			
With fitness dependent		-.53			
With management-level dependent		-.50			

*The *t* value for each coefficient is -5.86451.

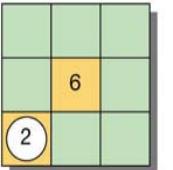
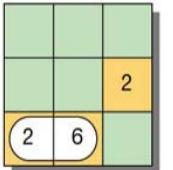
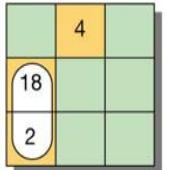
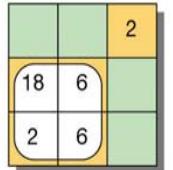
Calculation of Concordant (P), Discordant (Q), Tied (T_x, T_y), and Total Paired Observations: KeyDesign Example



$$n(n-1)/2 = 70(69)/2 = 2,415$$

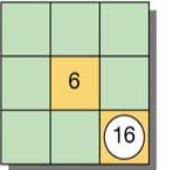
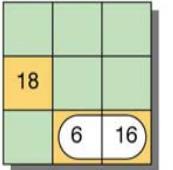
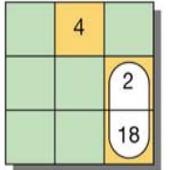
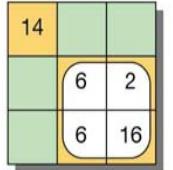
70

Concordant pairs



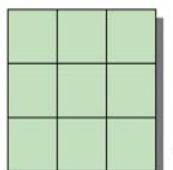
$$2(18 + 6 + 2 + 6) + 4(18 + 2) + 2(6 + 2) + 6(2) = 172$$

Discordant pairs



$$14(6 + 2 + 6 + 16) + 4(2 + 18) + 18(6 + 16) + 6(16) = 992$$

Tied pairs



$$T_y = \sum_{i=1}^r \frac{m_i(m_i - 1)}{2} = \frac{20(19)}{2} + \frac{26(25)}{2} + \frac{24(23)}{2} = 791$$

Total tied fitness

34 16 20 70

$$T_x = \sum_{j=1}^c \frac{m_j(m_j - 1)}{2} = \frac{34(33)}{2} + \frac{16(15)}{2} + \frac{20(19)}{2} = 871$$

Total tied management

KDL Data for Spearman's Rho

Applicant	Rank By		d	d^2
	Panel x	Psychologist y		
1	3.5	6.0	-2.5	6.25
2	10.0	5.0	5.0	25.00
3	6.5	8.0	-1.5	2.52
4	2.0	1.5	.05	0.25
5	1.0	3.0	-2	4.00
6	9.0	7.0	2.0	4.00
7	3.5	1.5	2.0	4.00
8	6.5	9.0	-2.5	6.25
9	8.0	10.0	-2	4.00
10	5.0	4.0	1.0	<u>1.00</u>
				57.00

Key Terms

- Artifact correlations
- Bivariate correlation analysis
- Bivariate normal distribution
- Chi-square-based measures
- Contingency coefficient C
- Cramer's V
- Phi
- Coefficient of determination (r^2)
- Concordant
- Correlation matrix
- Discordant
- Error term
- Goodness of fit
- lambda

Key Terms (cont.)

- Linearity
- Method of least squares
- Ordinal measures
- Gamma
- Somers's d
- Spearman's rho
- tau b
- tau c

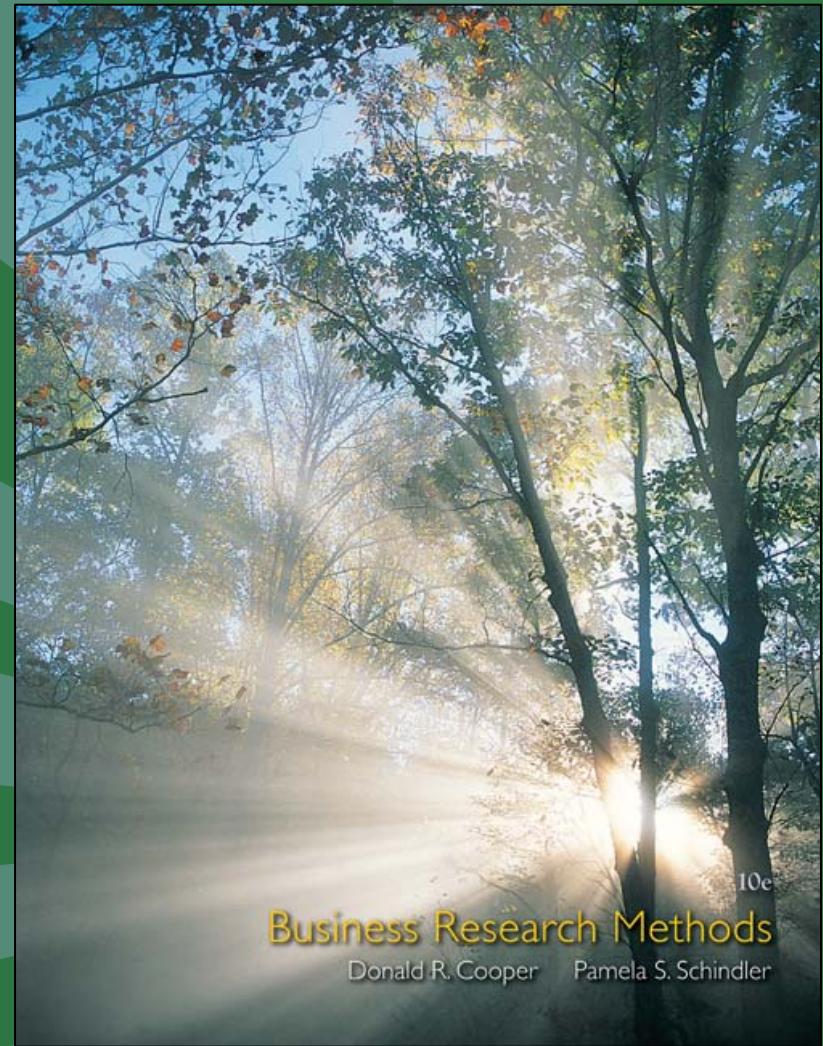
- Pearson correlation coefficient
- Prediction and confidence bands
- Proportional reduction in error (PRE)
- Regression analysis
- Regression coefficients

Key Terms (cont.)

<ul style="list-style-type: none">• Intercept• Slope• Residual	<ul style="list-style-type: none">• Scatterplot• Simple prediction• tau
--	---

Chapter 19

Multivariate Analysis: An Overview





Learning Objectives

Understand . . .

- How to classify and select multivariate techniques.
- That multiple regression predicts a metric dependent variable from a set of metric independent variables.
- That discriminant analysis classifies people or objects into categorical groups using several metric predictors.

Learning Objectives

Understand . . .

- How multivariate analysis of variance assesses the relationship between two or more metric dependent variables and independent classificatory variables.
- How structural equation modeling explains causality among constructs that cannot be directly measured.



Learning Objectives

Understand . . .

- How conjoint analysis assists researchers to discover the most importance attributes and the levels of desirable features.
- How principal components analysis extracts uncorrelated factors from an initial set of variables and exploratory factor analysis reduces the number of variables to discover the underlying constructs.



Learning Objectives

Understand . . .

- The use of cluster analysis techniques for grouping similar objects or people.
- How perceptions of products or services are revealed numerically and geometrically by multidimensional scaling.

PulsePoint: Research Revelation

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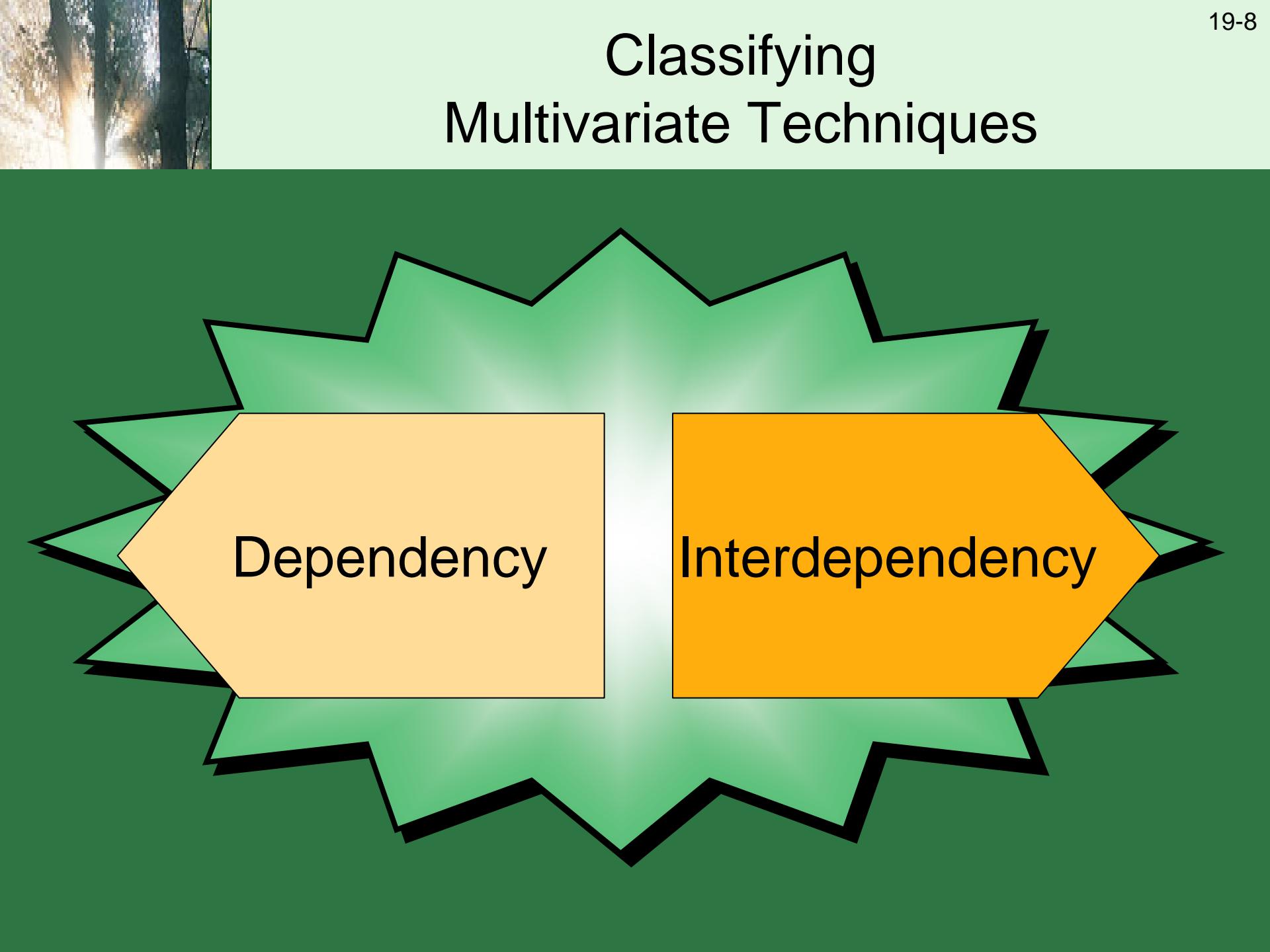
The percent of line employees that have *“trust and confidence”* in their company’s senior management.

Prying with Purpose

“Research is formalized curiosity. It is poking and prying with a purpose.”

Zora Neal Hurston
Anthropologist and author

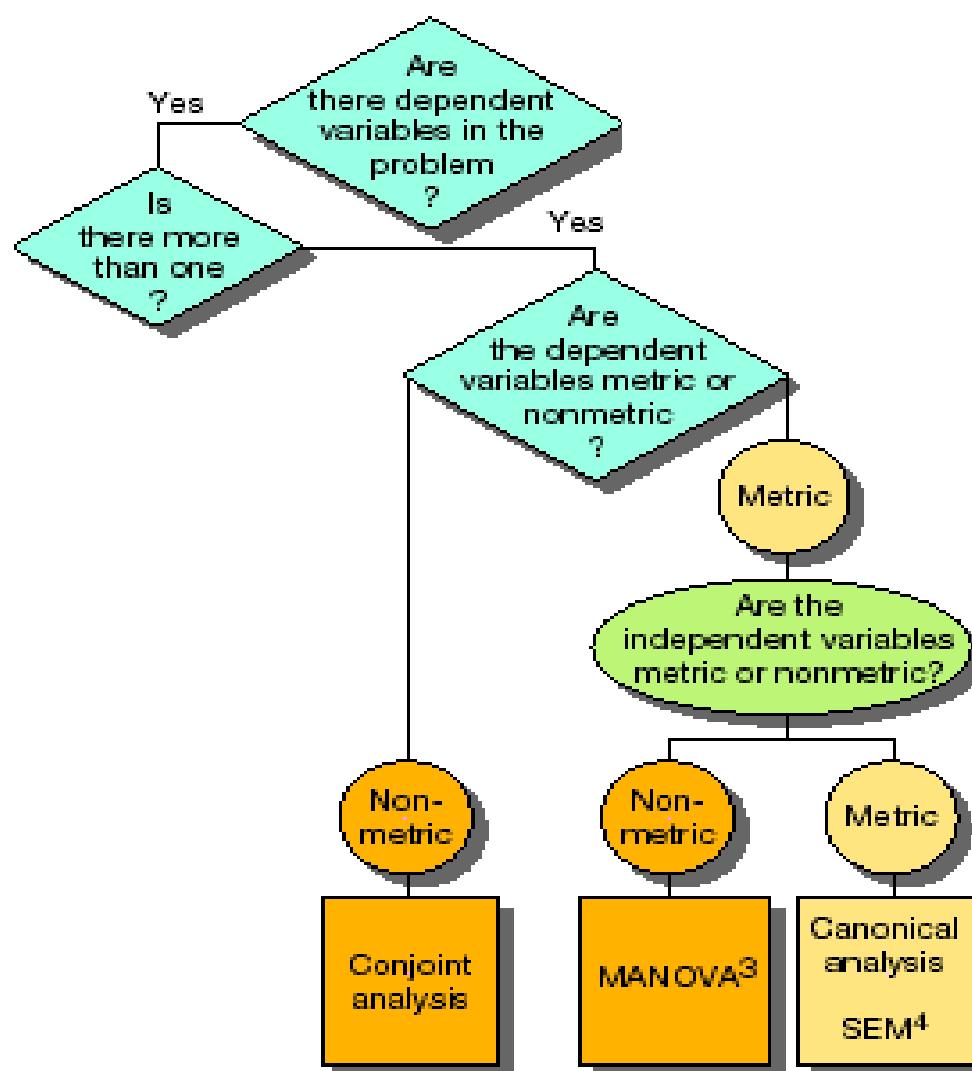
Classifying Multivariate Techniques



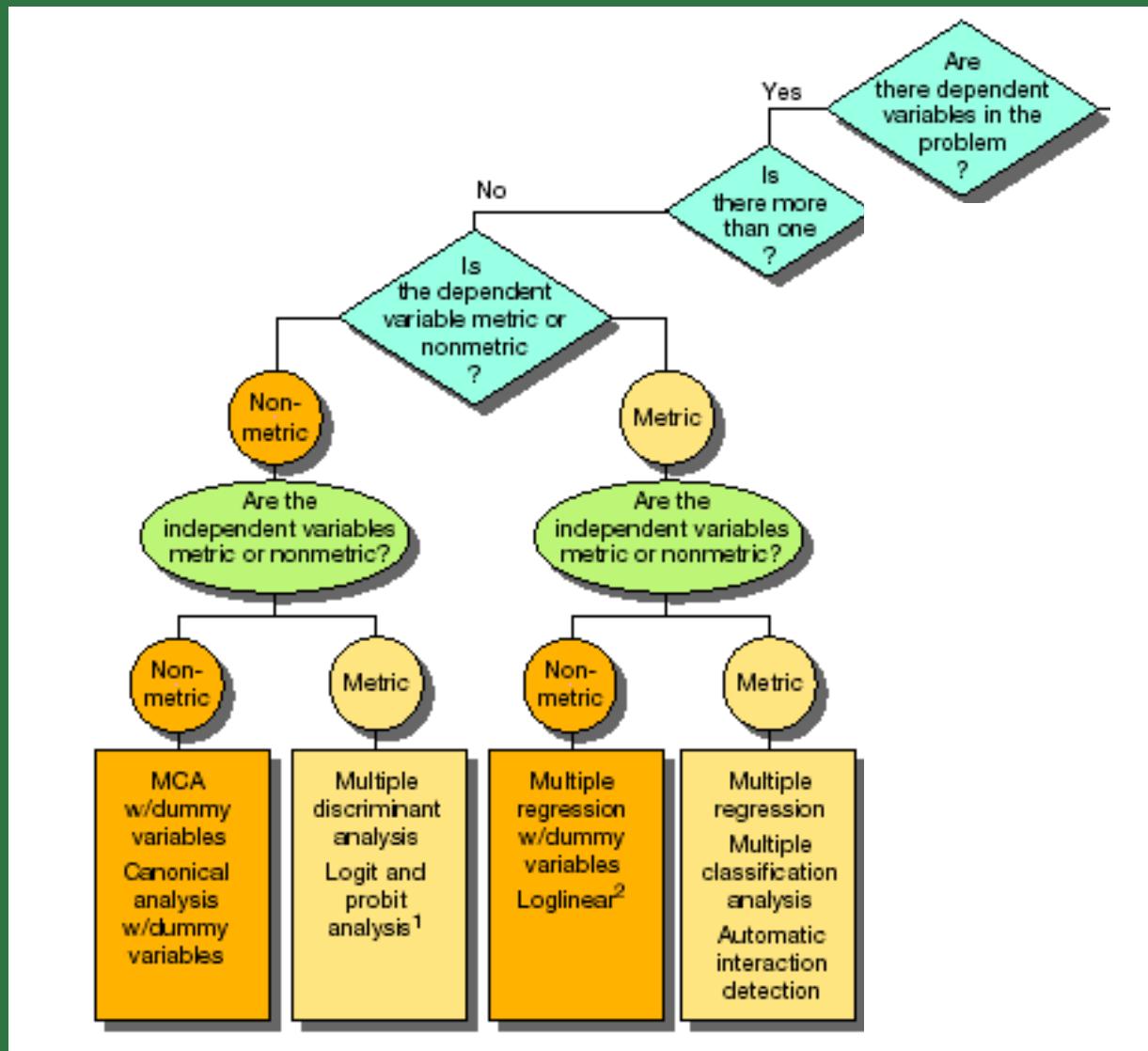
Dependency

Interdependency

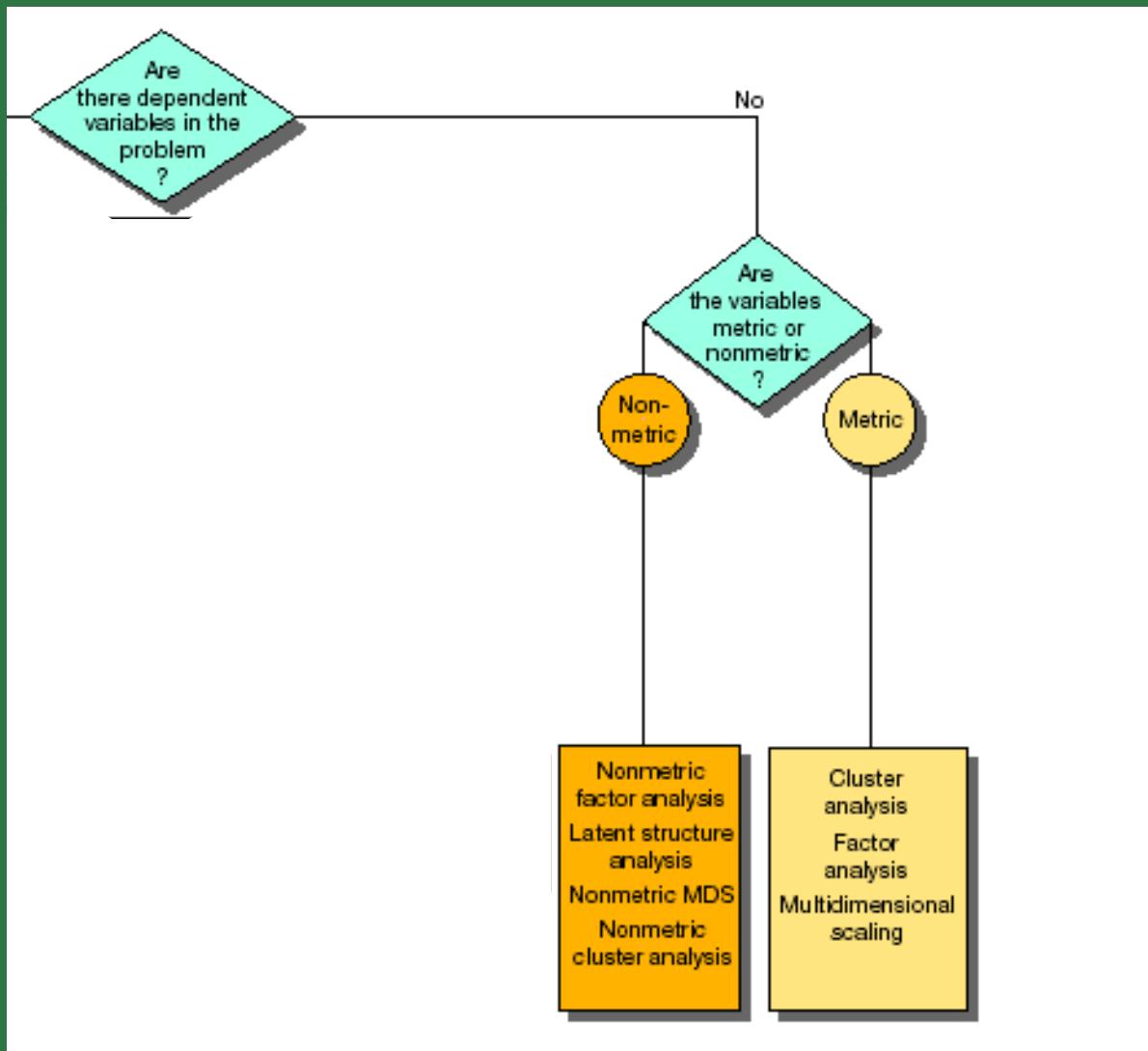
Multivariate Techniques



Multivariate Techniques



Multivariate Techniques



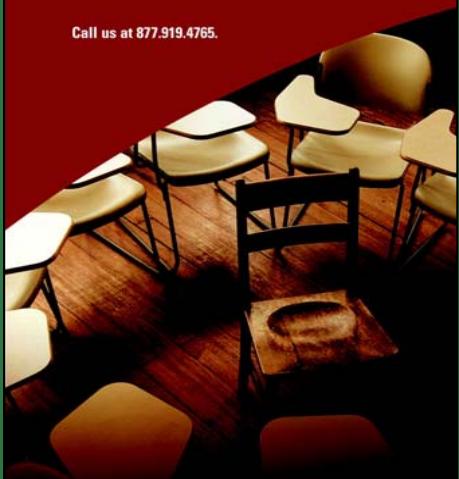
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YOUR ONLY OPTION
what do you do?

CHOOSE A PARTNER
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When using sophisticated techniques you want to rely on the knowledge of the researcher.

Harris Interactive promises you can trust their experienced research professionals to draw the right conclusions from the collected data.

Dependency Techniques

Multiple Regression

Discriminant Analysis

MANOVA

Structural Equation Modeling (SEM)

Conjoint Analysis

Uses of Multiple Regression

Develop self-weighting estimating equation to predict values for a DV

Control for confounding Variables

Test and explain causal theories

Generalized Regression Equation

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \epsilon$$

where

β_0 = a constant, the value of Y when all X values are zero

β_i = the slope of the regression surface (The β represents the regression coefficient associated with each X_i .)

ϵ = an error term, normally distributed about a mean of 0 (For purposes of computation, the ϵ is assumed to be 0.)

Multiple Regression Example

Model Summary

Model	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	Std. Error of the Estimate	Change Statistics				
					<i>R</i> ² Change	<i>F</i> Change	d.f.1	d.f.2	Sig. <i>F</i> Change
1	.879	.772	.771	.6589	.772	612.696	1	181	.000
2	.925	.855	.854	.5263	.083	103.677	2	180	.000
3	.935	.873	.871	.4937	.018	25.597	3	179	.000

1 Predictors: (constant), cost/speed.

2 Predictors: (constant), cost/speed, security.

3 Predictors: (constant), cost/speed, security, reliability.

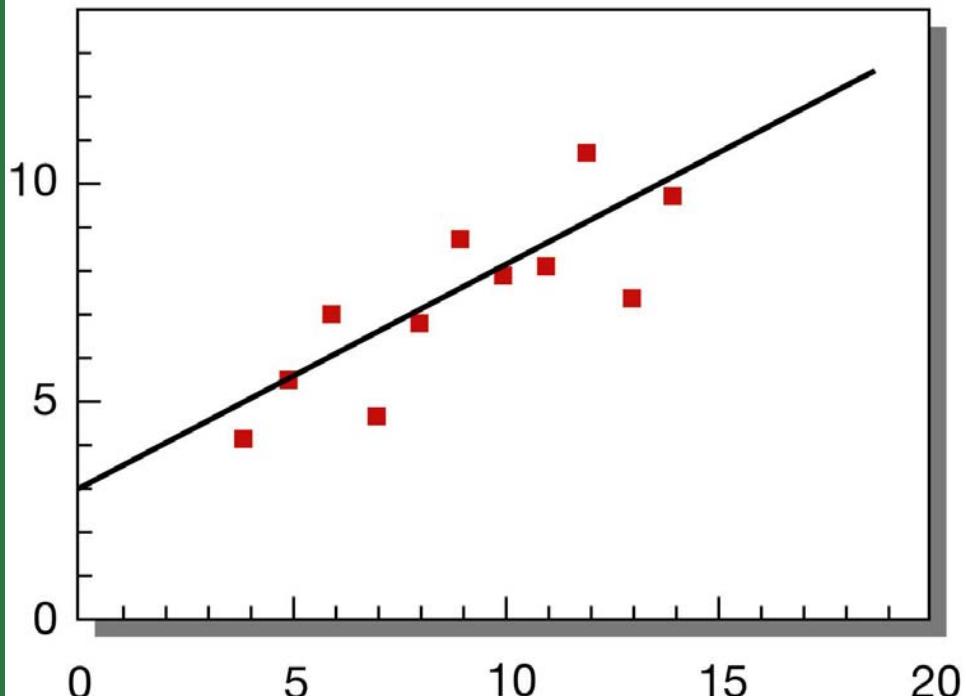
Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Collinearity Statistics
		B	Std. Error				
1	(Constant)	.579	.151		3.834	.000	1.000
	Cost/speed	.857	.035				
2	(Constant)	9.501E-02	.130		.733	.464	2.289
	Cost/speed	.537	.042				
	Security	.428	.042				
3	(Constant)	-9.326E-02	.127		-.734	.464	2.748
	Cost/speed	.448	.043				
	Security	.315	.045				
	Reliability	.254	.050				

Dependent variable: Customer usage.

Selection Methods

Plot 1



Forward

Backward

Stepwise

Evaluating and Dealing with Multicollinearity

Collinearity Statistics
VIF
1.000
2.289
2.289
2.748
3.025
3.067

Choose one of the variables and delete the other

Create a new variable that is a composite of the others

Discriminant Analysis

A.

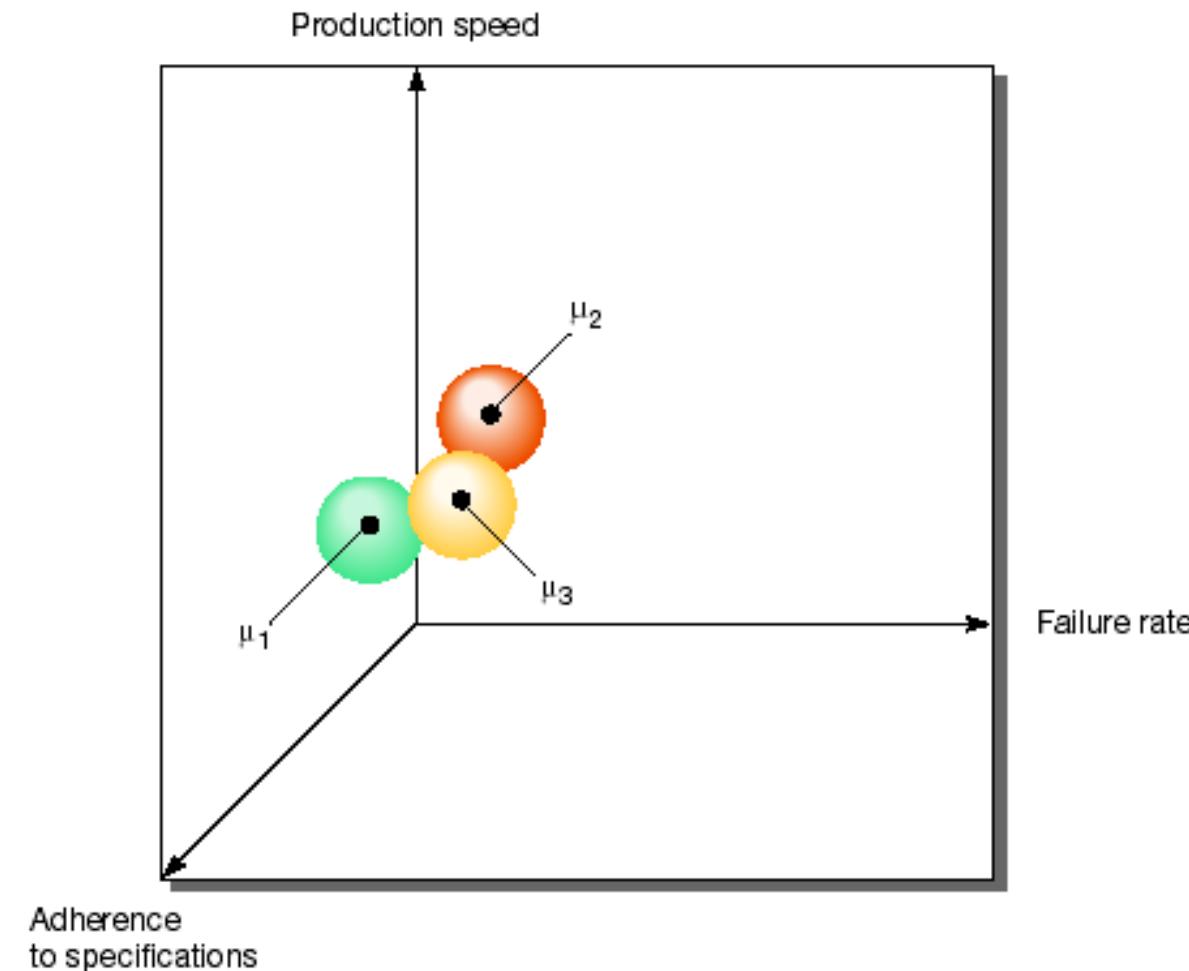
Actual Group		Number of Cases	Predicted Success	
			0	1
Unsuccessful	0	15	13 86.70%	2 13.30%
Successful	1	15	3 20.00%	12 80.00%

Note: Percent of “grouped” cases correctly classified: 83.33%

B.

	Unstandardized	Standardized
X_1	.36084	.65927
X_1	2.61192	.57958
X_1	.53028	.97505
Constant	12.89685	

MANOVA



MANOVA Output

VARIABLE	FACTOR	LEVEL	MEAN	STD. DEV.
FAILURE				
	METHOD	1	158.867	4.998
	METHOD	2	181.067	5.994
	For entire sample		169.967	12.524
SPECIFICATIONS				
	METHOD	1	89.800	2.077
	METHOD	2	94.800	2.178
	For entire sample		92.300	3.292
SPEED				
	METHOD	1	2.126	.061
	METHOD	2	2.599	.068
	For entire sample		2.362	.249

Bartlett's Test

Statistics for WITHIN CELLS correlations

Log (Determinant) = -3.92663

Bartlett's test of sphericity = 102.74687 with 3 D.F.

Significance = .000

F_{max} criterion = 7354.80363 with (3,28) D.F.

MANOVA Homogeneity-of-Variance Tests

VARIABLE	TEST	RESULTS
FAILURE		
	Cochran's C (14, 2) =	.58954, $P = .506$ (approx.)
	Bartlett-Box F (1, 2352) =	.44347, $P = .506$
SPECIFICATIONS		
	Cochran's C (14, 2) =	.52366, $P = .862$ (approx.)
	Bartlett-Box F (1, 2352) =	.03029, $P = .862$
SPEED		
	Cochran's C (14, 2) =	.55526, $P = .684$ (approx.)
	Bartlett-Box F (1, 2352) =	.16608, $P = .684$
Multivariate Test for Homogeneity of Dispersion Matrices		
	Box's M =	6.07877
	F with (6, 5680) DF =	.89446, $P = .498$ (approx.)
	Chi-Square with 6 DF =	5.37320, $P = .497$ (approx.)

Multivariate Tests of Significance

Multivariate Tests of Significance ($S = 1$, $M = 1/2$, $N = 12$)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Hotelling	51.33492	444.90268	3.00	26.00	.000
Pillai	.98089	444.90268	3.00	26.00	.000
Wilks	.01911	444.90268	3.00	26.00	.000

Univariate Tests of Significance

Univariate F Tests with (1,28) D.F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
FAILURE	3696.30000	852.66667	3696.30000	30.45238	121.37967	.000
SPECS	187.50000	126.80000	187.50000	4.52857	41.40379	.000
SPEED	1.67560	.11593	1.67560	.00414	404.68856	.000

Structural Equation Modeling (SEM)

Model Specification

Estimation

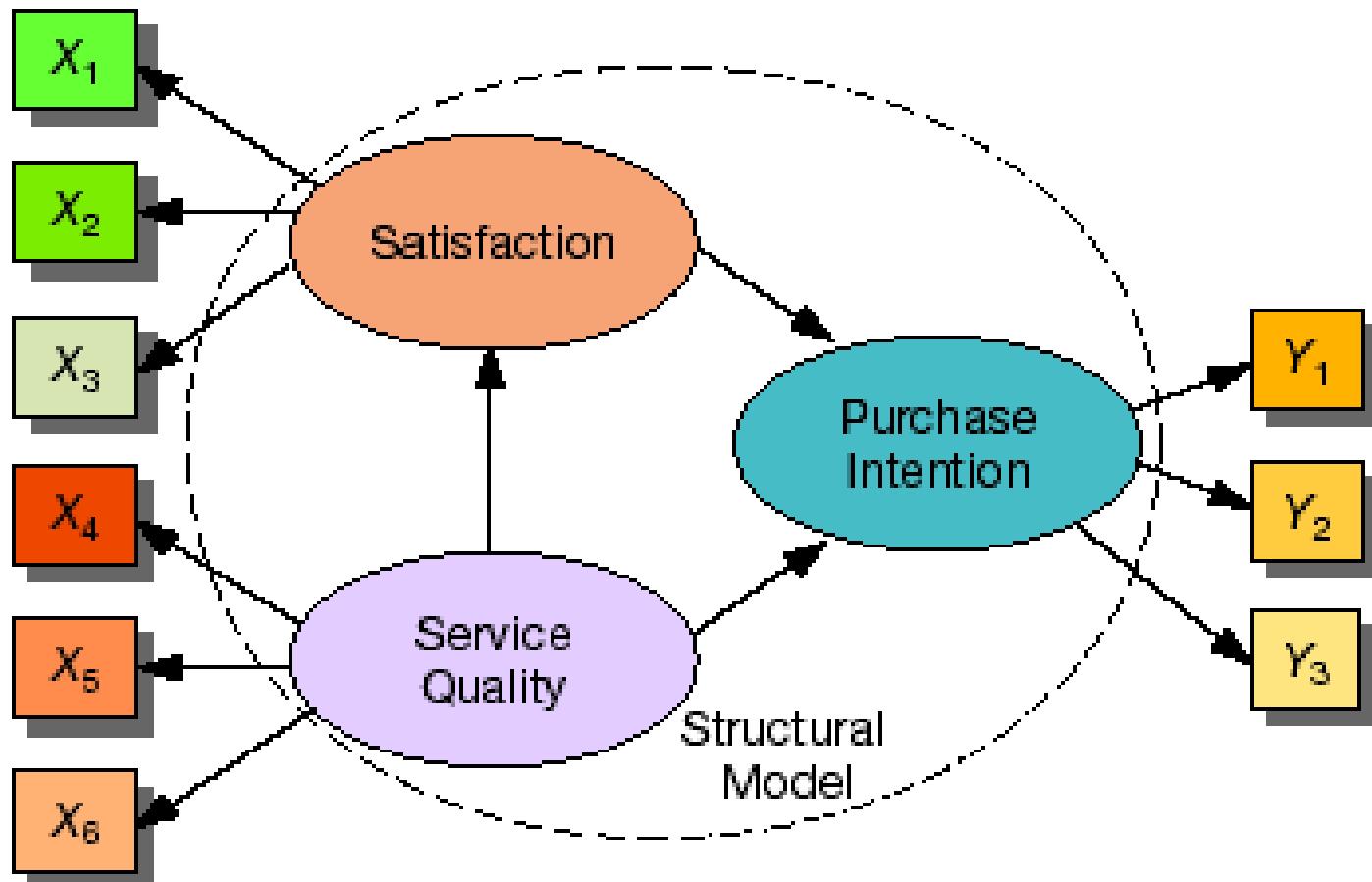
Evaluation of Fit

Respecification of the Model

Interpretation and Communication

Structural Equation Modeling (SEM)

Measurement Model
(independent variables)



Measurement Model
(outcome variables)

Concept Cards for Conjoint Sunglasses Study

Card 2

Watersport Eyewear Comparison

Style and design: C
Brand name: Bolle
Flotation? No
Price: \$72

Card 1

Watersport Eyewear Comparison

Style and Design: A
Brand Name: Oakley Eyeshade
Flotation? Yes
Price: \$60

Limited

Style and Design



Multiple color choice: frames, lenses, temples

Conjoint Analysis



Brand	Bolle	Hobbies	Oakley	Ski Optiks
Style*	A	A	A	A
	B	B		
	C	C		
Flotation	Yes	Yes	Yes	Yes
	No			
Price	\$100	\$100	\$100	\$100
	\$72	\$72	\$72	\$72
	\$60	\$60	\$60	\$60
	\$40	\$40	\$40	\$40

* A = multiple color choices for frames, lenses, and temples.

B = multiple color choices for frames, lenses, and straps (no hard temples).

C = limited colors for frames, lenses, and temples.



Conjoint Results for Participant 8 Sunglasses Study

Subject name: 8

Importance	Utility (s.e.)	Factor	Level *
23.86	-1.4167(.3143) 3.4583(.3685) -2.0417(.3685)	STYLE	Style and design A B C
11.93	-1.4375(.4083) .3125(.4083) 1.3125(.4083) -.1875(.4083)	BRAND	Brand Name Bolle Hobbies Oakley Ski Optiks
45.01	10.3750(.4715) 20.7500(.9429) B = 10.3750(.4715)	FLOAT	Flotation? No Yes
19.20	1.4750(.2108) 2.9500(.4217) 4.4250(.6325) 5.9000(.8434) B = 1.4750(.2108)	PRICE	Price * \$100 \$72 \$60 \$40
	-8.2083(.9163)	CONSTANT	

Pearson's r = .994

Pearson's r = .990 for 4 holdouts

Significance = .0000

Significance = .0051

Kendall's tau = .967

Kendall's tau = 1.000 for 4 holdouts

Significance = .0000

Significance = .0208

Conjoint Results for Sunglasses Study

Importance	Utility	Factor	Level
18.31	1.1583 -1.9667 .8083	STYLE	Style and design A B C
7.62	.1938 -.7813 .5187 .0688	BRAND	Brand Name Bolle Hobbies Oakley Ski Optiks
31.57	5.3875 10.7750 B = 5.3875	FLOAT	Flotation? No Yes
42.50	2.4175 4.8350 7.2525 9.6700 B = 2.4175	PRICE	Price \$100 \$72 \$60 \$40
	-3.4583	CONSTANT	

Pearson's r = .995

Pearson's r = .976 for 4 holdouts

Significance = .0000

Significance = .0120

Kendall's tau = .950

Kendall's tau = 1.000 for 4 holdouts

Significance = .0000

Significance = .0208

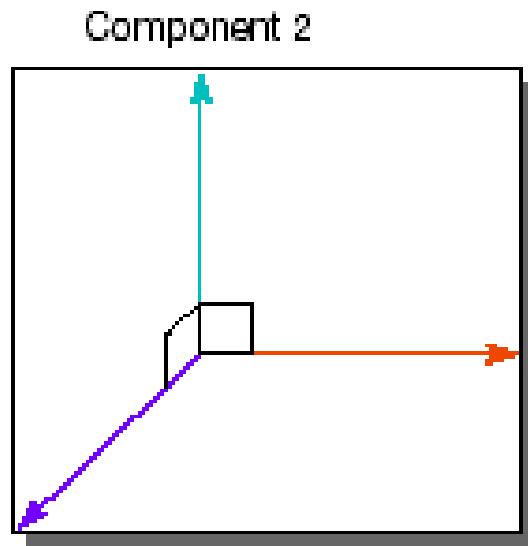
Interdependency Techniques

Factor Analysis

Cluster Analysis

Multidimensional Scaling

Factor Analysis



Component 1

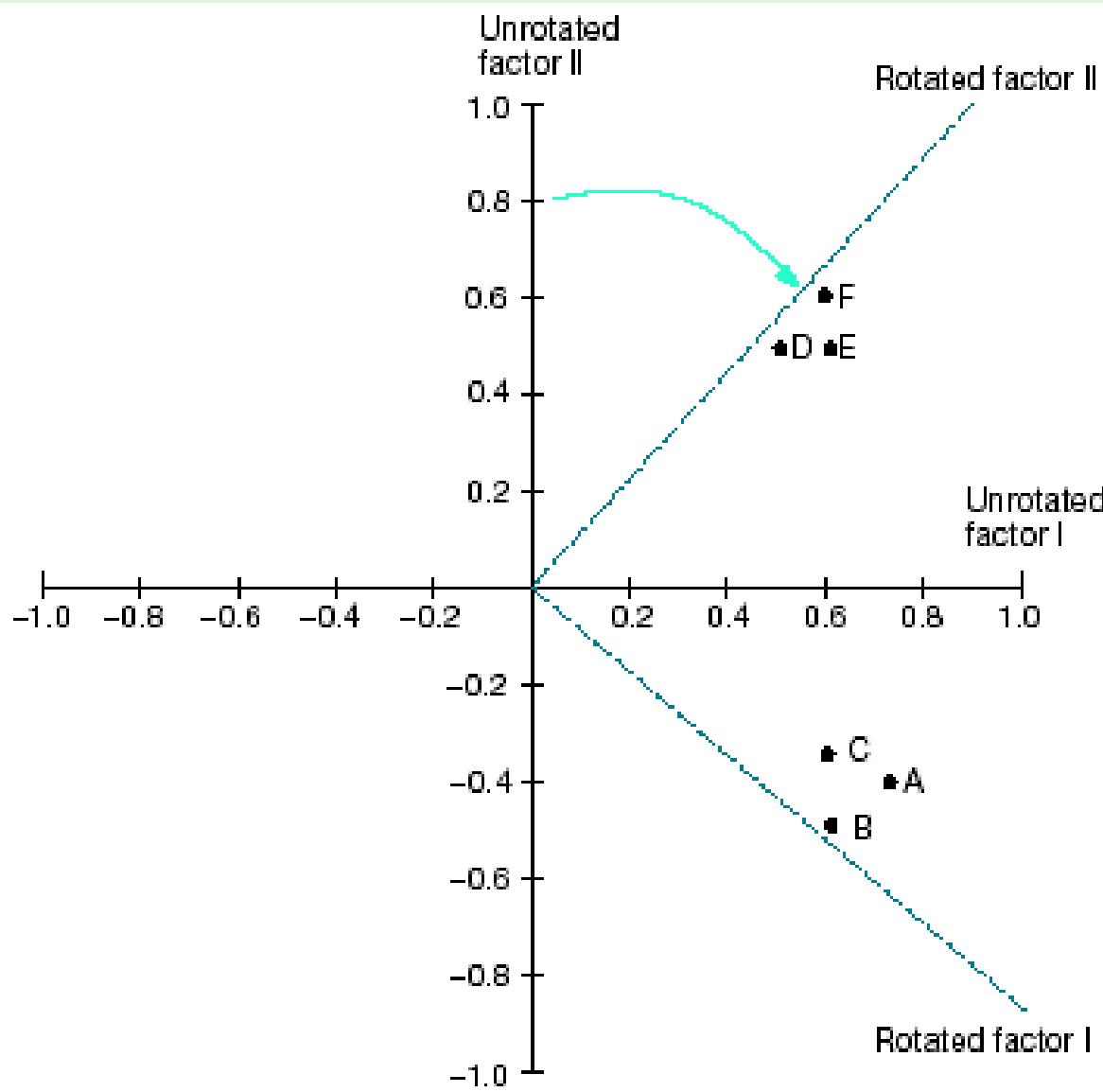
Component 3

Extracted Components	% of Variance Accounted For	Cumulative Variance
Component no. 1	63%	63%
Component no. 2	29	92
Component no. 3	8	100

Factor Matrices

Variable	A <u>Unrotated Factors</u>			B <u>Rotated Factors</u>	
	I	II	<i>h2</i>	I	II
A	0.70	-.40	0.65	0.79	0.15
B	0.60	-.50	0.61	0.75	0.03
C	0.60	-.35	0.48	0.68	0.10
D	0.50	0.50	0.50	0.06	0.70
E	0.60	0.50	0.61	0.13	0.77
F	0.60	0.60	0.72	0.07	0.85
Eigenvalue	2.18	1.39			
Percent of variance	36.3	23.2			
Cumulative percent	36.3	59.5			

Orthogonal Factor Rotations



Correlation Coefficients, Metro U MBA Study

Variable	Course	V1	V2	V3	V10
V1	Financial Accounting	1.00	0.56	.017	-.01
V2	Managerial Accounting	0.56	1.00	-.22	0.06
V3	Finance	0.17	-.22	1.00	0.42
V4	Marketing	-.14	0.05	-.48	-.10
V5	Human Behavior	-.19	-.26	-.05	-.23
V6	Organization Design	-.21	-.00	-.56	-.05
V7	Production	-.44	-.11	-.04	-.08
V8	Probability	0.30	0.06	0.07	-.10
V9	Statistical Inference	-.05	0.06	-.32	0.06
V10	Quantitative Analysis	-.01	0.06	0.42	1.00

Factor Matrix, Metro U MBA Study

Variable	Course	Factor 1	Factor 2	Factor 3	Communality
V1	Financial Accounting	0.41	0.71	0.23	0.73
V2	Managerial Accounting	0.01	0.53	-.16	0.31
V3	Finance	0.89	-.17	0.37	0.95
V4	Marketing	-.60	0.21	0.30	0.49
V5	Human Behavior	0.02	-.24	-.22	0.11
V6	Organization Design	-.43	-.09	-.36	0.32
V7	Production	-.11	-.58	-.03	0.35
V8	Probability	0.25	0.25	-.31	0.22
V9	Statistical Inference	-.43	0.43	0.50	0.62
V10	Quantitative Analysis	0.25	0.04	0.35	0.19
Eigenvalue		1.83	1.52	0.95	
Percent of variance		18.30	15.20	9.50	
Cumulative percent		18.30	33.50	43.00	

Varimax Rotated Factor Matrix

Variable	Course	Factor 1	Factor 2	Factor 3
V1	Financial Accounting	0.84	0.16	-.06
V2	Managerial Accounting	0.53	-.10	0.14
V3	Finance	-.01	0.90	-.37
V4	Marketing	-.11	-.24	0.65
V5	Human Behavior	-.13	-.14	-.27
V6	Organization Design	-.08	-.56	-.02
V7	Production	-.54	-.11	-.22
V8	Probability	0.41	-.02	-.24
V9	Statistical Inference	0.07	0.02	0.79
V10	Quantitative Analysis	-.02	0.42	0.09

Cluster Analysis

Select sample to cluster

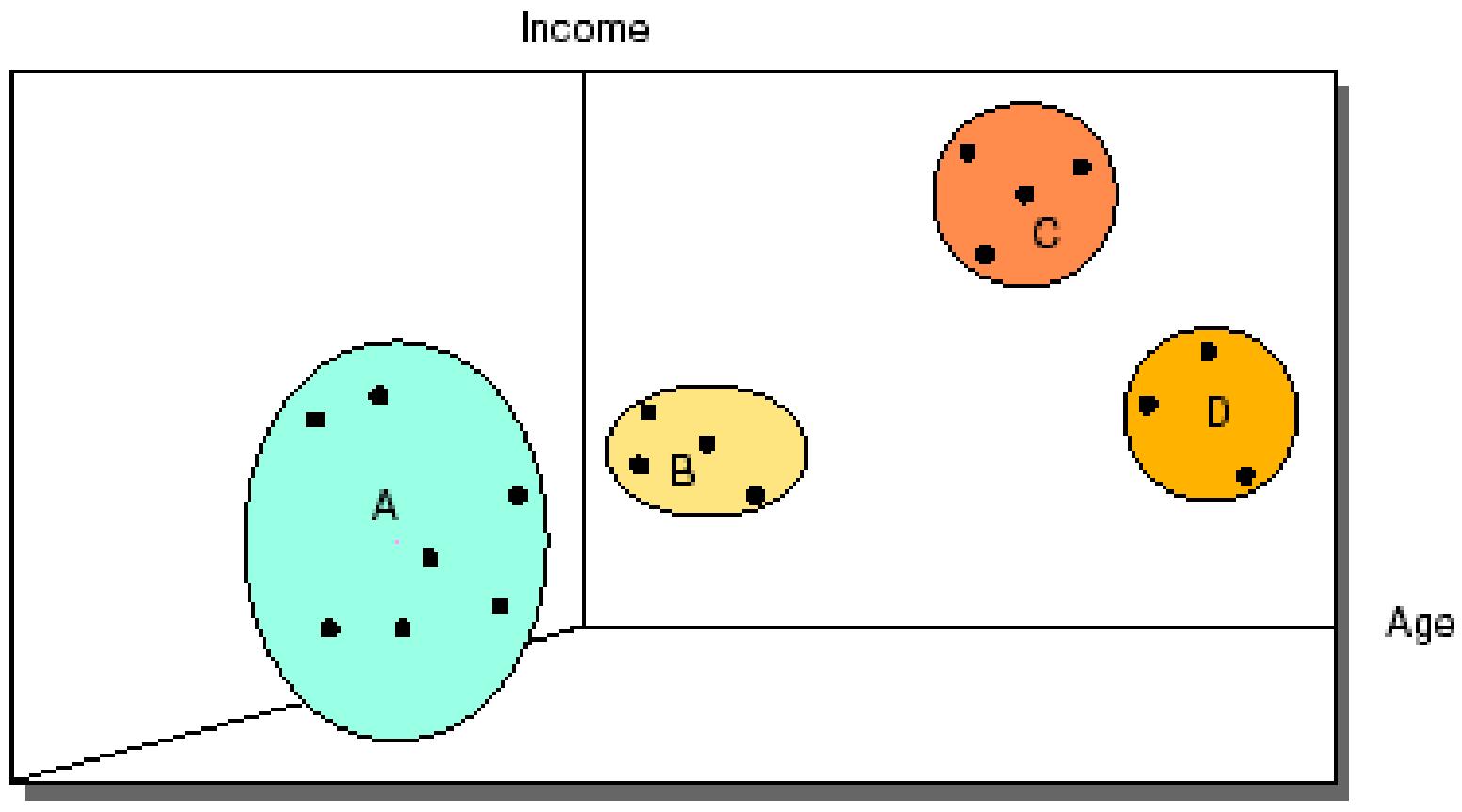
Define variables

Compute similarities

Select mutually exclusive clusters

Compare and validate cluster

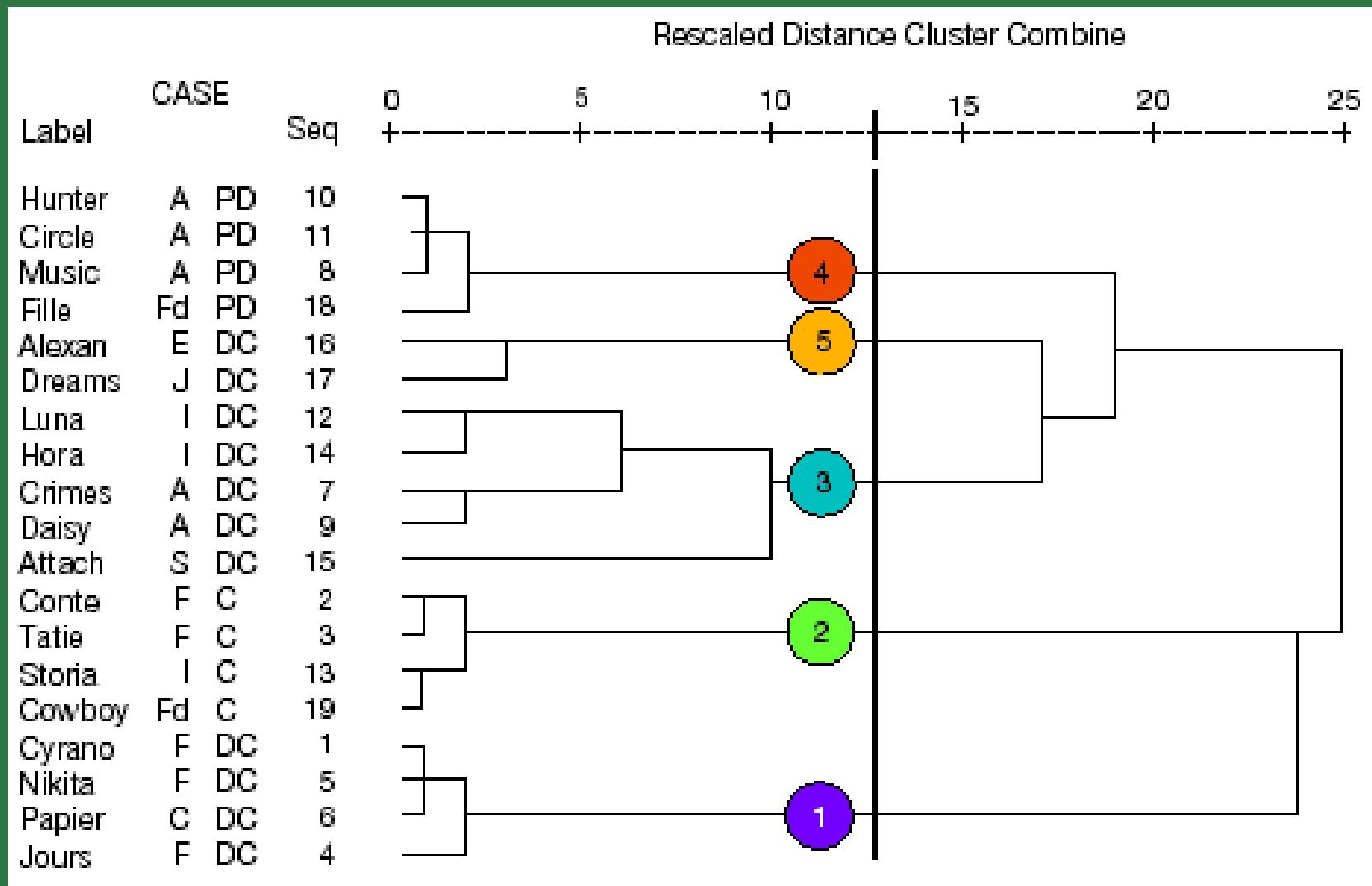
Cluster Analysis



Cluster Membership

Film	Country	Genre	Case	Number of Clusters			
				5	4	3	2
<i>Cyrano de Bergerac</i>	France	DramaCom	1	1	1	1	1
<i>Il y a des Jours</i>	France	DramaCom	4	1	1	1	1
<i>Nikita</i>	France	DramaCom	5	1	1	1	1
<i>Les Noces de Papier</i>	Canada	DramaCom	6	1	1	1	1
<i>Leningrad Cowboys . . .</i>	Finland	Comedy	19	2	2	2	2
<i>Storia de Ragazzi . . .</i>	Italy	Comedy	13	2	2	2	2
<i>Conte de Printemps</i>	France	Comedy	2	2	2	2	2
<i>Tatie Danielle</i>	France	Comedy	3	2	2	2	2
<i>Crimes and Misdem . . .</i>	USA	DramaCom	7	3	3	3	2
<i>Driving Miss Daisy</i>	USA	DramaCom	9	3	3	3	2
<i>La Voce della Luna</i>	Italy	DramaCom	12	3	3	3	2
<i>Che Hora E</i>	Italy	DramaCom	14	3	3	3	2
<i>Attache-Moi</i>	Spain	DramaCom	15	3	3	3	2
<i>White Hunter Black . . .</i>	USA	PsyDrama	10	4	4	3	2
<i>Music Box</i>	USA	PsyDrama	8	4	4	3	2
<i>Dead Poets Society</i>	USA	PsyDrama	11	4	4	3	2
<i>La Fille aux All . . .</i>	Finland	PsyDrama	18	4	4	3	2
<i>Alexandrie, Encore . . .</i>	Egypt	DramaCom	16	5	3	3	2
<i>Dreams</i>	Japan	DramaCom	17	5	3	3	2

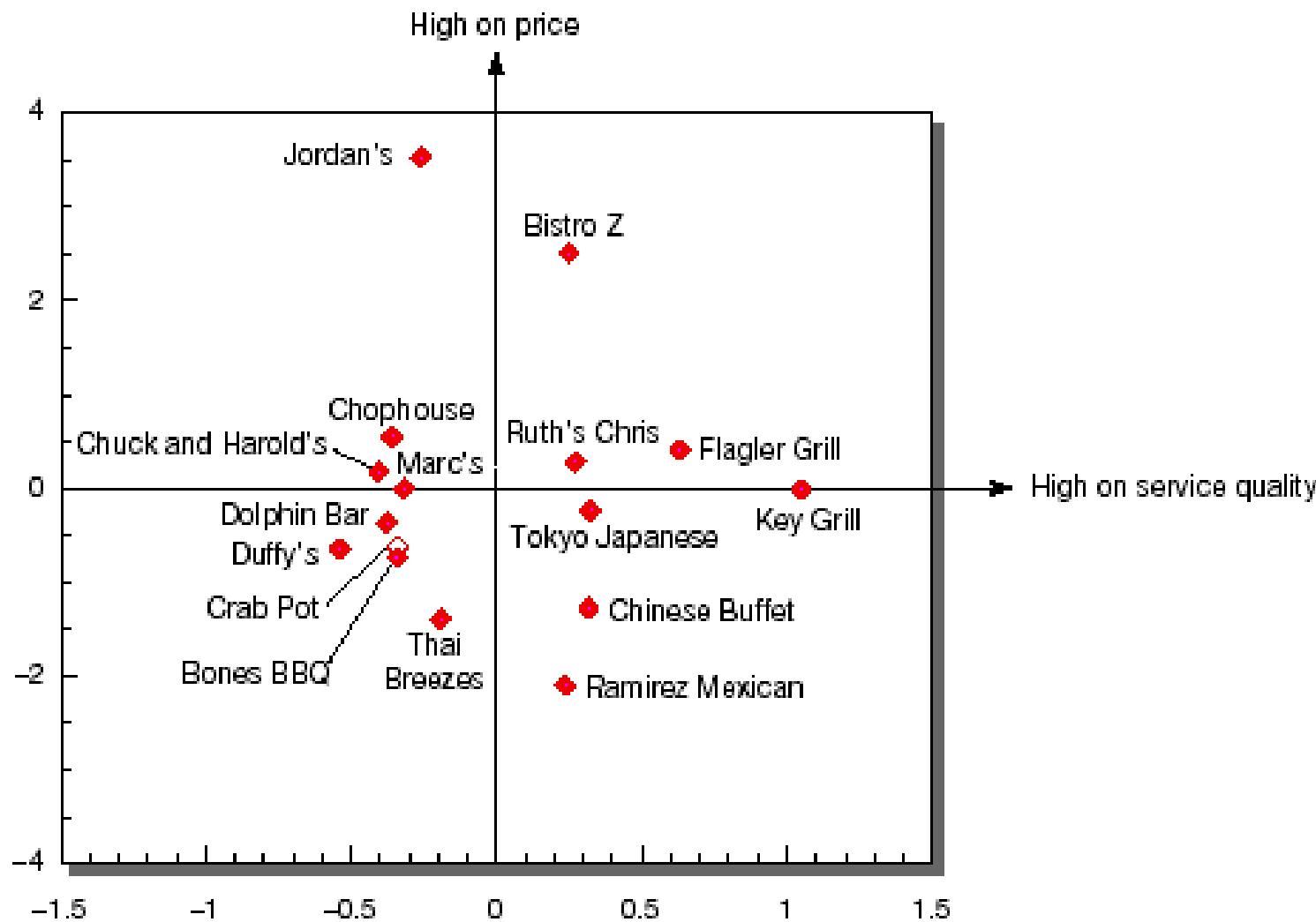
Dendogram



Similarities Matrix of 16 Restaurants

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0															
2	3.9	0														
3	4.7	6.7	0													
4	4.4	2.8	4.7	0												
5	14.0	12.4	18.5	15.2	0											
6	4.9	6.9	0.2	4.9	18.7	0										
7	0.8	3.7	4.1	3.7	14.5	4.3	0									
8	6.0	2.1	8.5	4.0	11.8	6.7	5.8	0								
9	4.3	6.9	1.1	5.3	18.3	1.2	3.8	6.9	0							
10	6.2	4.9	8.5	4.1	15.3	6.6	7.6	3.9	9.3	0						
11	6.6	6.7	4.7	5.9	21.1	4.5	7.8	9.7	5.7	7.7	0					
12	2.2	3.7	6.9	5.5	11.8	7.1	2.8	5.5	6.5	8.5	10.5	0				
13	6.4	9.8	3.7	7.2	22.0	3.5	7.8	11.2	4.5	10.0	2.9	10.6	0			
14	12.8	13.4	8.2	10.6	25.8	8.1	12.1	14.4	9.1	12.0	4.7	14.9	4.6	0		
15	19.1	18.2	23.8	21.0	6.2	24.0	19.7	17.8	23.4	21.5	26.9	16.9	27.4	31.5	0	
16	2.6	5.2	2.1	4.0	16.5	2.3	2.0	7.2	1.9	8.0	6.3	4.8	5.8	10.3	21.7	0

Positioning of Selected Restaurants



Key Terms

- Average linkage method
- Backward elimination
- Beta weights
- Centroid
- Cluster analysis
- Collinearity
- Communality
- Confirmatory factor analysis
- Conjoint analysis
- Dependency techniques
- Discriminant analysis
- Dummy variable
- Eigenvalue
- Factor analysis

Key Terms (cont.)

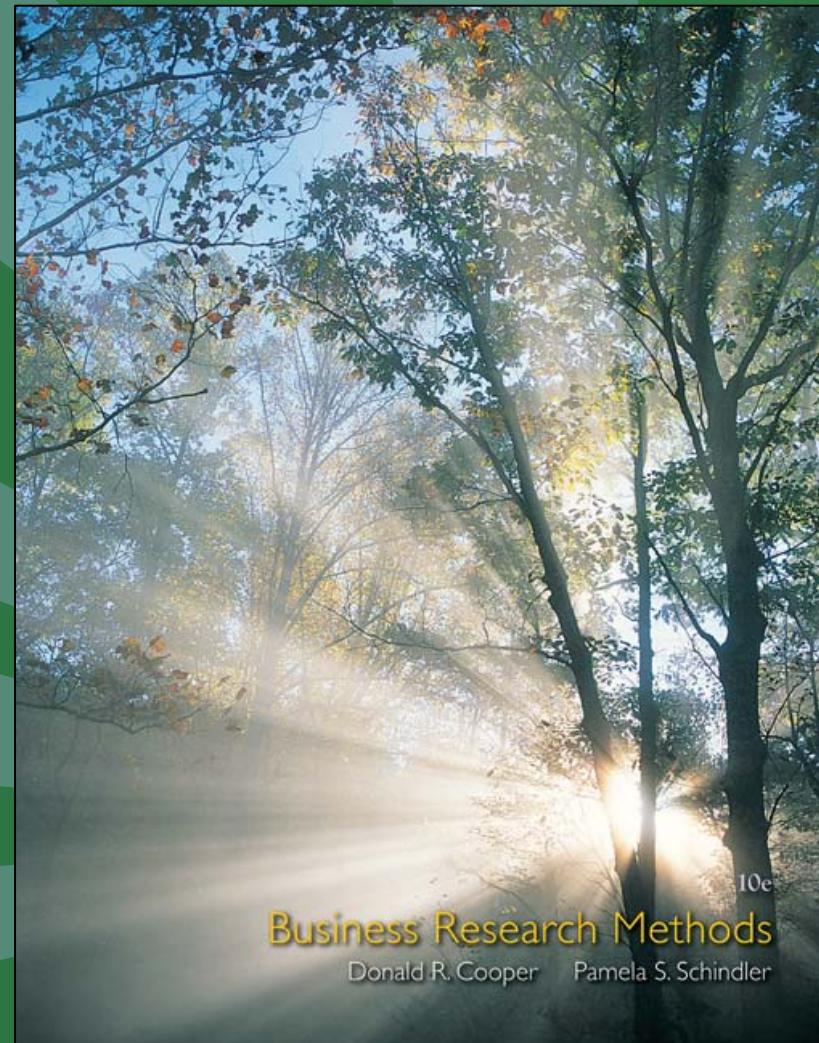
- Factors
- Forward selection
- Holdout sample
- Interdependency techniques
- Loadings
- Metric measures
- Multicollinearity
- Multidimensional scaling (MDS)
- Multiple regression
- Multivariate analysis
- Multivaria analysis of variance (MANOVA)
- Nonmetric measures
- Path analysis

Key Terms (cont.)

- Path diagram
- Principal components analysis
- Rotation
- Specification error
- Standardized coefficients
- Stepwise selection
- Stress index
- Structural equation modeling
- Utility score

Chapter 20

Presenting Insights and Findings: Written and Oral Reports





Learning Objectives

Understand . . .

- That a quality presentation of research findings can have an inordinate effect on a reader's or a listener's perceptions of a study's quality.
- The contents, types, lengths, and technical specifications of research reports.
- That the writer of a research report should be guided by questions of purpose, readership, circumstances/ limitations, and use.



Learning Objectives

Understand . . .

- That while some statistical data may be incorporated into the text, most statistics should be placed in tables, charts, or graphs.
- That oral presentations of research findings should be developed with concern for organization, visual aids, and delivery in unique communication settings.

PulsePoint: Research Revelation

3

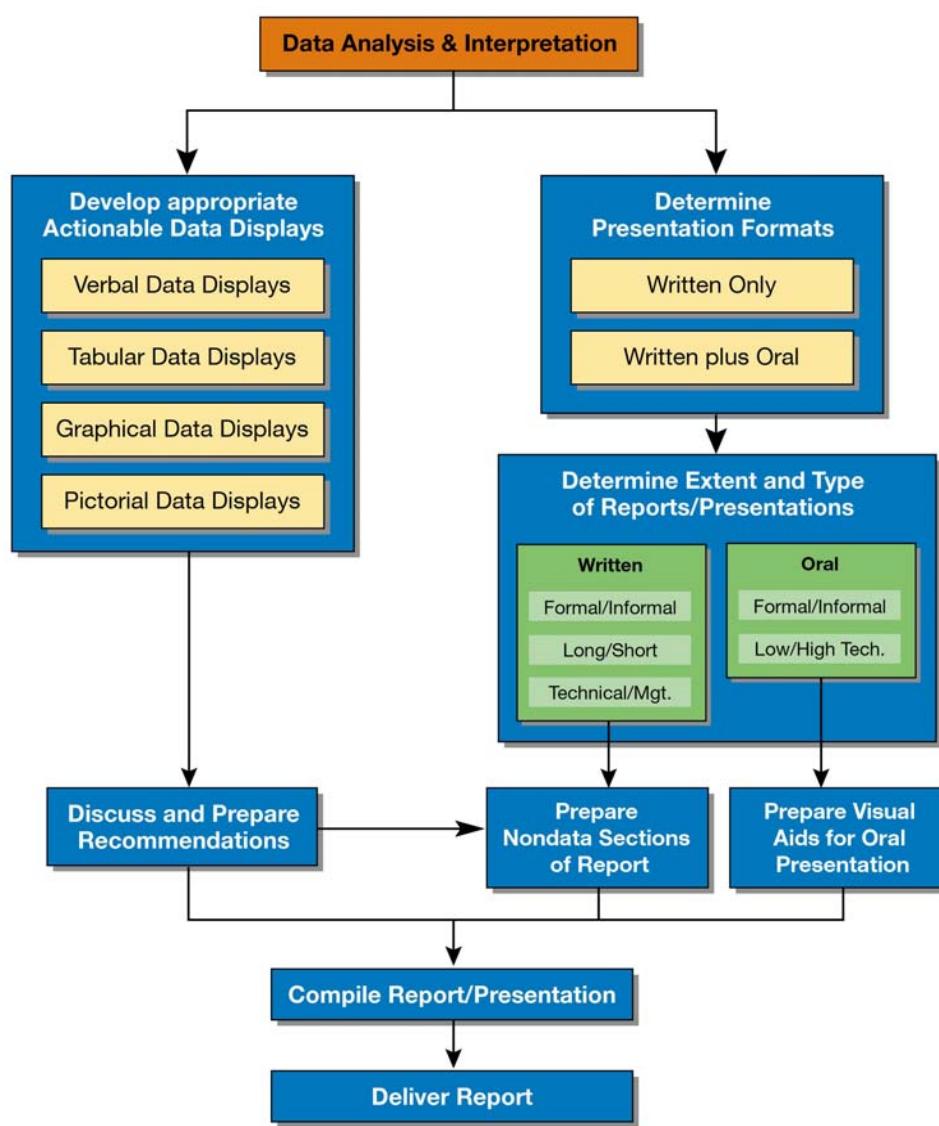
The percent of business executives who think they are doing a good job of anticipating socio-political issues that will affect their company's performance.

Relevance. Not Quantity.

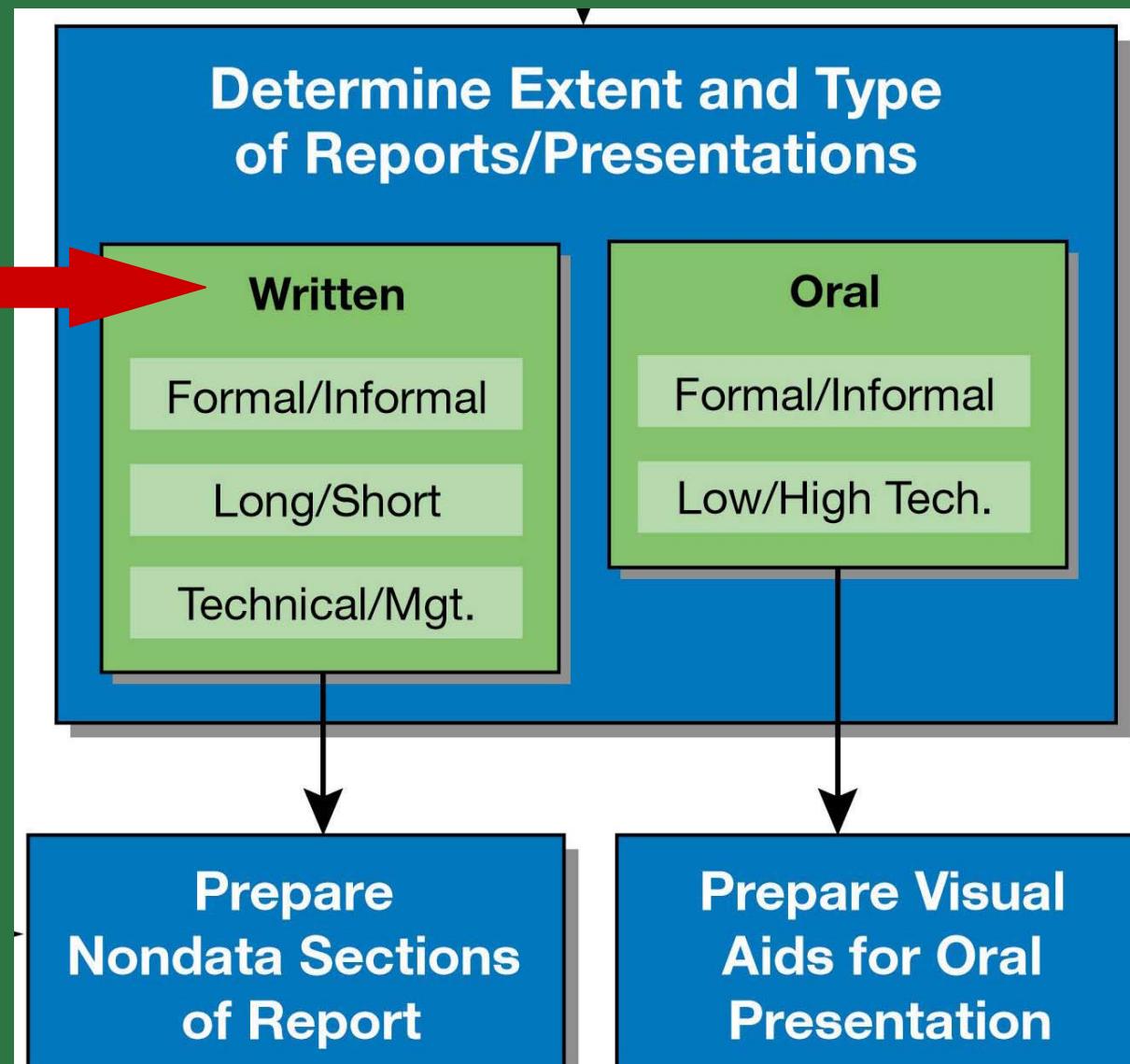
“Focus on relevance. It’s never about the volume of analyzed data or the complexity of an algorithm but about the actionability of derived insight.”

*Michael Fassnacht, founder
Loyalty Matrix*

Sponsor Presentation and the Research Process



The Written Research Report



Guidelines for Short Reports

Tell reader why you are writing

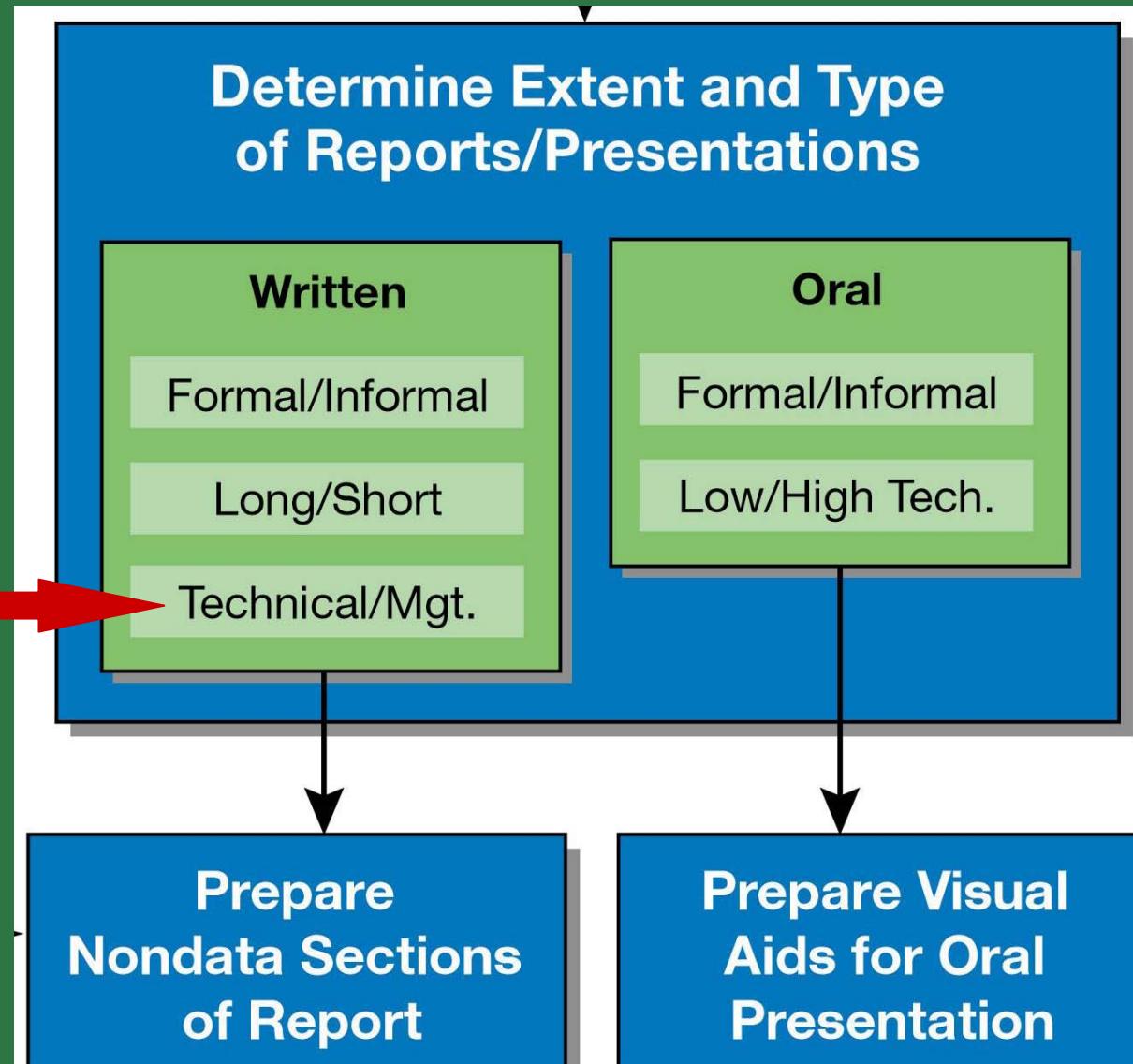
Remind reader of request

Write in an expository style

Write report and hold for review

Attach detailed materials in appendix

The Long Research Report



Report Modules

Prefatory Information

Introduction

Methodology

Findings

Conclusions & Recommendations

Appendices

Bibliography



Components: Short Report: Memo or Letter-Style

1. Introduction

- Problem statement
- Research objectives
- Background

2. Conclusions

- Summary and conclusions
- Recommendations

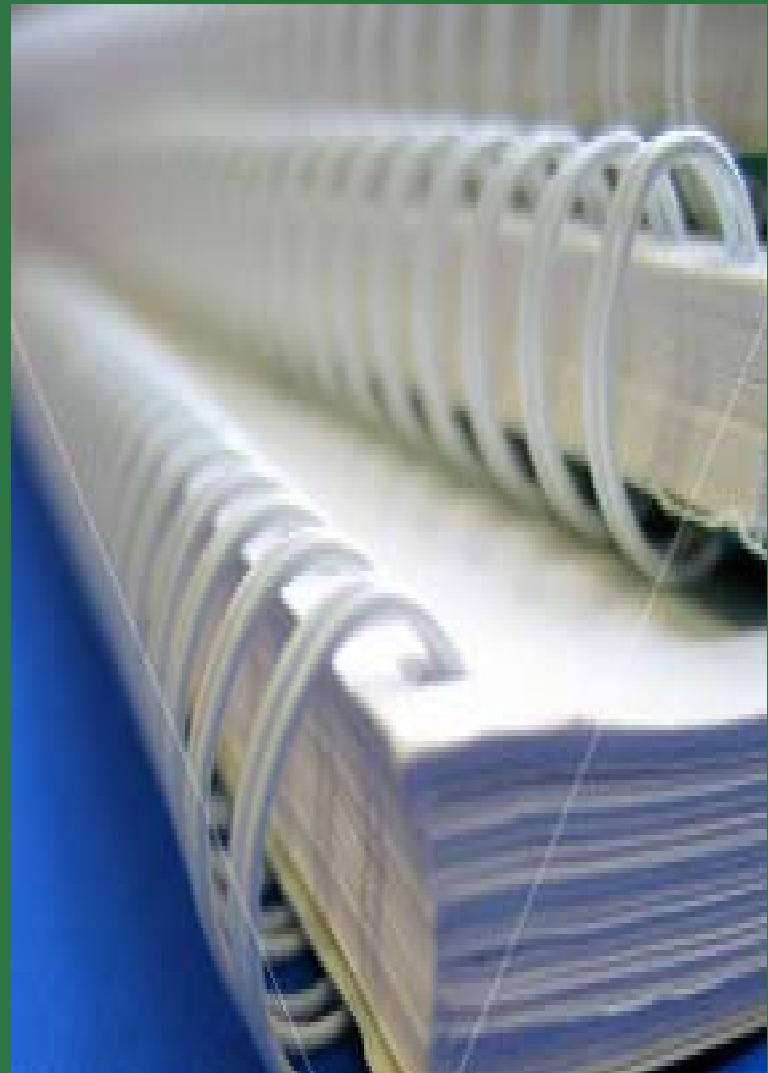
Components:

Short Report: Technical

1. Prefatory Information (all)
2. Introduction (all, plus brief methodology and limitations)
3. Findings
4. Conclusions
5. Appendices

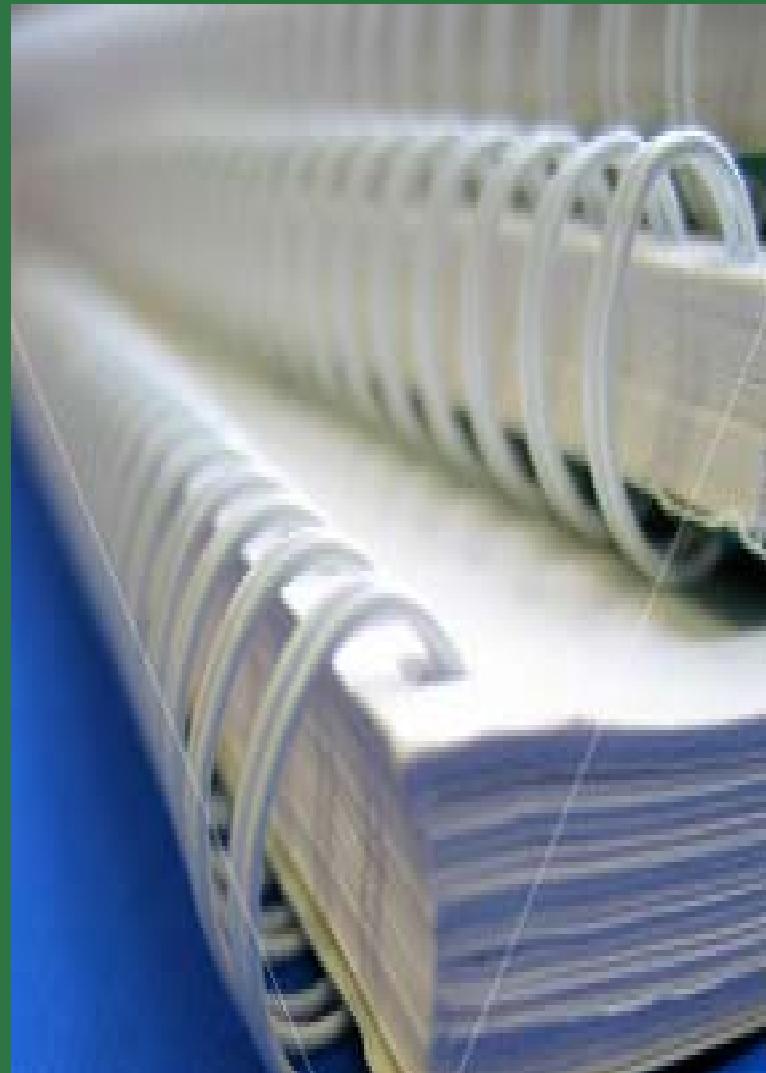
Components: Long, Report: Management

1. Prefatory Information (all)
2. Introduction (all, plus brief methods and limitations)
3. Conclusions and Recommendations
4. Findings
5. Appendices



Components: Long Report: Technical

1. Prefatory Information
2. Introduction
3. Methodology (full, detailed)
4. Findings
5. Conclusions
6. Appendices
7. Bibliography



Sample Findings Page: Tabular

Findings: 1. In this city, *commercial banks are not the preferred savings medium.* Banks are in a weak third place behind money market accounts.

2. Customers of the Central City Bank have a *somewhat more favorable attitude toward bank savings* and less of a preference for government bonds.

Question: Suppose that you have just received an extra \$1,000 and have decided to save it. Which of the savings methods listed would be your preferred way to save it?

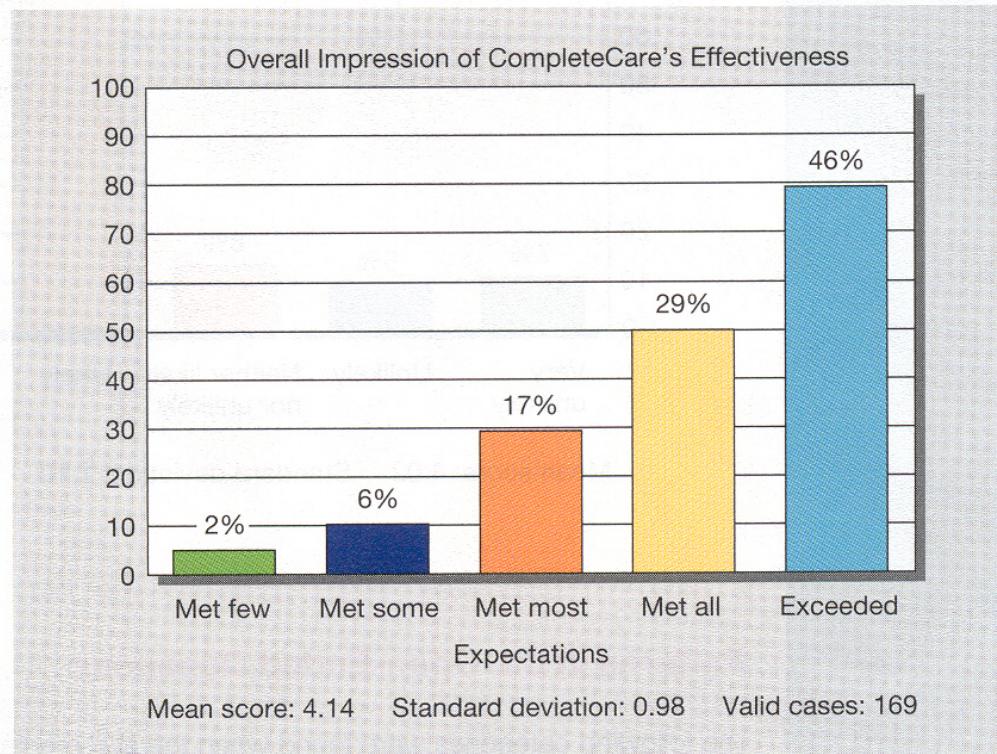
- Government bonds
- Savings and loan
- Bank savings
- Credit union
- Stock
- Other

Savings Method	Total Replies	Central City Bank Customers	Other Bank Customers
Government bonds	24%	20%	29%
Savings and loan	43	45	42
Bank	13	18	8
Credit union	9	7	11
Stock	7	8	5
Other	4	2	5
Total	100%	100%	100%
	<i>n</i> = 216	<i>n</i> = 105	<i>n</i> = 111

Sample Findings Page: Graphical

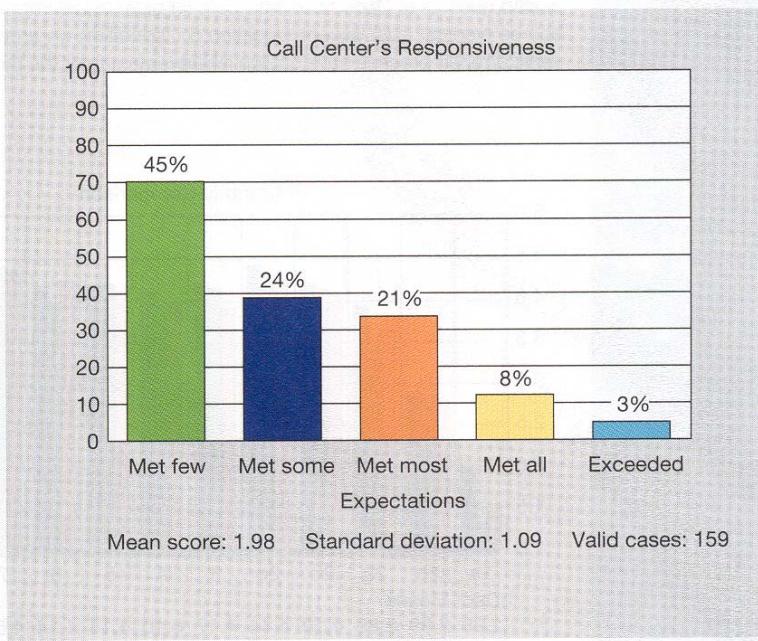
Question 6. Overall Impression of CompleteCare's Effectiveness.

CompleteCare has increased the number of truly satisfied respondents with 46 percent (versus 43 percent in November) in the *exceeded expectations* category. The top-box score has increased to 75 percent of respondents (against 70 percent in November).

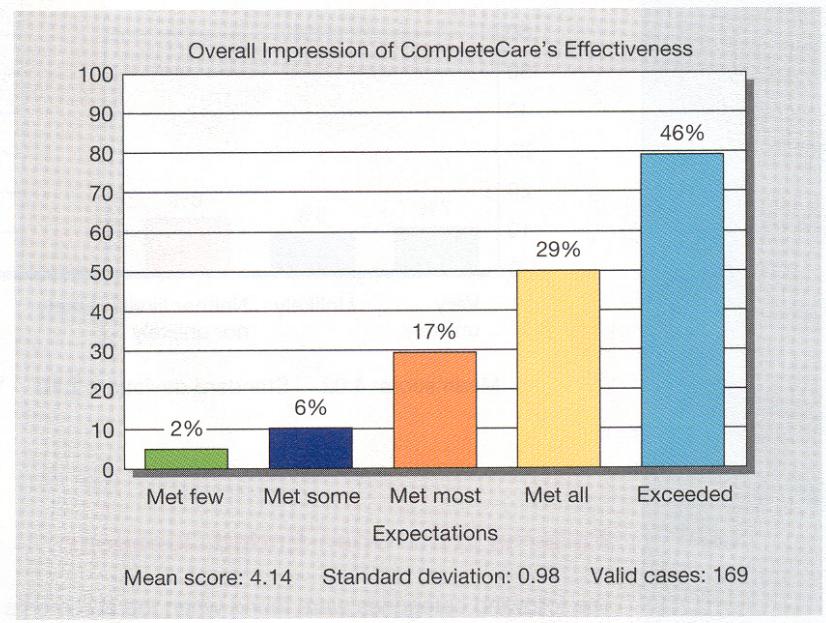


Findings Page Templates

Question 1a. Call Center's Responsiveness. This question has the lowest mean score of the survey. Using a top-box method of reporting (combining the top two categories), 11 percent of the respondents felt that the Call Center met or exceeded their expectations for service responsiveness. This has improved only marginally since November and has significant implications for program targets. Based on our visit and recent results, we recommend that you begin immediately the contingency programs we discussed: additional training for Call Center operators and implementation of the proposed staffing plan.



Question 6. Overall Impression of CompleteCare's Effectiveness. CompleteCare has increased the number of truly satisfied respondents with 46 percent (versus 43 percent in November) in the exceeded expectations category. The top-box score has increased to 75 percent of respondents (against 70 percent in November).



Prewriting Concerns

What is the report's purpose?

Who will read the report?

What are the circumstances?

How will the report be used?

The Outline

- I. Major Topic Heading
 - A. Major subtopic heading
 - 1. Subtopic
 - a. Minor subtopic
 - 1) Further detail

Types of Outlines

Topic

- I. Demand
 - A. How measured
 - 1. Voluntary error
 - 2. Shipping error
 - a. Monthly variance

Sentence

- I. Demand for refrigerators
 - A. Measured in terms of factory shipments as reported by the U.S. Department of Commerce
 - 1. Error is introduced into year to year comparisons

Grammar and Style Proofreader Results

Statistics for: Chapter 3 Vignette	Problems marked/detected: 8/8
Readability Statistics	
Flesch Reading Ease: 66	Flesch-Kincaid Grade Level: 8
Gunning's Fog Index: 11	
Paragraph Statistics	
Number of paragraphs: 25	Average length: 2.2 sentences
Sentence Statistics	
Number of sentences: 55	Passive voice: 4
Average length: 13.8 words	Short (< 12 words) : 39
End with ?: 2	Long (> 28 words) : 7
End with !: 0	
Word Statistics	
Number of words: 759	Average length: 4.58 letters

Adjusting Pace

Use ample white space

Use headings

Use visual aids

Use italics and underlining

Choose words carefully

Repeat and summarize

Use service words strategically

Considerations for Writing

Readability

Comprehensibility

Tone

Avoiding Overcrowded Text

When the expectation-based satisfaction scores are adjusted for perceived importance, "Call Center responsiveness," "Call Center technical competence," and "courier arrangements" are identified as action items. "Repair speed" and "problem resolution" maintained high importance scores and are also rated above average.

Methodology

The data collection instrument is a postage-paid postcard that is packed with the repaired product at the time the unit is shipped back to the customer.

The survey consists of 12 satisfaction questions measured on five-point scales. The questions record the degree to which the components of the CompleteCare process (arrangements for receiving the customer's computer through return of the repaired product) meet customers' expectations. A final categorical question asks whether customers will use CompleteCare again. Space for suggestions is provided.

Sample

The sample consisted of 175 customers who provided impressions of CompleteCare's effectiveness. For the four-week period, the response rate was 35 percent with no incentive given. Nothing is yet known about the differences between respondents and nonrespondents.

Service Improvement Grid

The grid on page three compares the degree to which expectations were met along with the *derived importance* of those expectations. The average scores for both axes determine the dividing lines for the four quadrants. The quadrants are labeled to identify actionable items and to highlight those that bear watching for improvement or deterioration.

The **Concentrate Efforts** quadrant is the area where customers are marginally satisfied with service but consider service issues important. Question 1a, "Call Center's responsiveness," Question 1b, "Call Center's technical competence," and Question 2a, "courier arrangements," are found here. "Technical competence" was similarly rated last month. Its perceived importance was rated higher in previous months. "Courier arrangements" has increased in perceived importance over previous reports.

Use shorter paragraphs

Indent or space parts of text

Use headings

Use bullets

Presentation of Statistics

Text

Semi-tabular

Tables

Graphics

Example of Text Presentation

Wal-Mart regained its top rank in the Forbes 500 due to its strong sales performance (11% increase, \$351.1 billion). Although Wal-Mart surpassed number-2 ranked Exxon Mobil in sales, Wal-Mart's profitability (\$11.2 billion) was far below that of the oil giant (\$39.5 billion).

Example: Semi-Tabular Presentation

Although Wal-Mart regained the top spot in the Fortune 500, its performance shows signs of weakness in profitability.

- Wal-Mart is the largest business in the Fortune 500 with sales increasing more than 11% over last year's performance.
- Oil giant and energy exploration leader Exxon Mobil is the most profitable company in the Fortune 500 due to record crude oil prices increasing its profits to \$39.5 billion, compared to \$11.2 billion for Wal-Mart.

Example of Tabular Presentation

Company	Rank	Revenue (\$, millions)	Sales Growth	Profits	Profit Growth
Wal-Mart	1	\$351,139.0	11.2%	\$11,284.0	0.5%
Exxon Mobil	2	\$347,254.0	02.2%	\$39,500.0	9.3%
General Electric	6	\$168,307.0	07.1%	\$20,829.0	27.4%

Sample Tabular Findings

Title
Column Headers
Banner

Total Adults
Any Online/Internet Usage*
Home/Work/Other
Home
Work
Used the Internet in the last 30 days

Percent Distribution
Education
Age
Employment
Occupation
Body

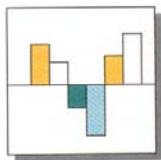
Men
Women
Graduated College Plus
Attended College
Did not Attend College
Age 18-34
Age 35-54
Age 55+
Employed Full-time
Employed Part-time
Professional
Mgmt./Bus/Finan./Ops.
Sales/Office Occs.
Nat. Res./Constr./Maint.
Other Employed
Household Income
Marital Status
Household Size
Footnote
Source Note

216,971
143,262
175,569
140,062
79,121
141,284
48.2
51.8
48.3
51.7
49.1
50.9
49.4
50.6
48
52.0
35.1
33.1
29.9
30.5
34.4
31.8
46.3
31.3
33.3
22.4
33.8
31.3
36.4
44.0
33.6
42.2
31.8
31.8
33.3
24.2
23.5
14.4
19.4
52.9
11.5
62.7
12.9
58.4
12.4
60.6
12.7
87.1
12.4
63.0
18.6
19.0
13.1
20.9
16.1
11.4
18.4
12.8
31.1
29.3
19.3
9.5
16.1
6.0
18.7
6.4
6.4
5.4
5.9
13.2
21.0
13.3
19.9
47.5
10.9
33.3
33.0
29.2
32.2
11.5
23.5
22.9
21.3
15.1
40.6
23.0
21.8
11.0
33.2
22.8
33.0
24.7
47.5
26.5
60.1
18.7
26.5
64.1
13.4
56.4
15.5
13.3
64.8
15.7
26.5
60.2
12.4
41.1
41.0
41.1
15.8
16
44.5
15.9
14.4
48.1
44.2
45.0
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41.1
45.6
41.1
45.6
44.2
45.0
41.1
45.7

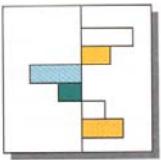
* Any online/internet usage is net of those who looked at or used the Internet or any online service at home, work, or another place in the last 30 days.

Source: MRI CyberStats, Spring 2006 (March 2005–May 2006) (http://www.siiainc.net/software/pubs/usage_06.pdf).
Copyright 2006, Mediemark Research Inc.

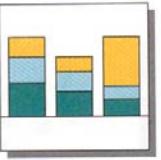
Graphics Presentation



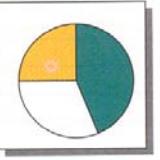
Column Compares sizes and amounts of categories usually for the same time. Places categories on X axis and values on Y axis.



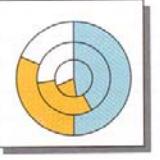
Bar Same as the column but positions categories on Y axis and values on X axis. Deviations, when used, distinguish positive from negative values.



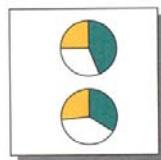
Stacked Bar In either bar or column, shows how components contribute to the total of the category.



Pie Shows relationship of parts to the whole. Wedges are row values of data.



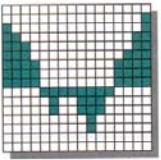
Stacked Pie Same as pie but displays two or more data series.



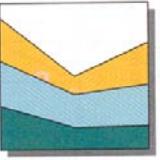
Multiple Pie Uses same data as stacked pie but plots separate pies for each column of data without stacking.



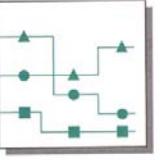
Line Compares values over time to show changes in trends.



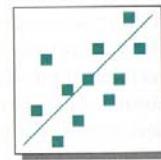
Filled Line Similar to line chart, but uses fill to highlight series.



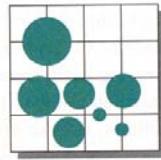
Area (surface) Like line chart, compares changing values but emphasizes relative value of each series.



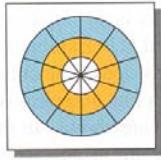
Step Compares discrete points on the value axis with vertical lines showing difference between points. Not for showing a trend.



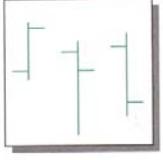
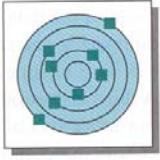
Scatter Shows if relationship between variables follows a pattern. May be used with one variable at different times.



Bubble Used to introduce third variable (dots of different sizes). Axes could be sales, profits; bubbles are assets.



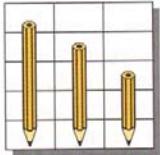
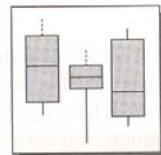
Spider (and Radar) Radiating lines are categories; values are distances from center (shows multiple variables—e.g., performance, ratings, progress).



Polar Shows relationship between a variable and angle measured in degrees (cyclical trends, pollution source vs. wind direction, etc.).

Open Hi Lo Close Shows fluctuating values in a given period (hour, day). Often used for investments.

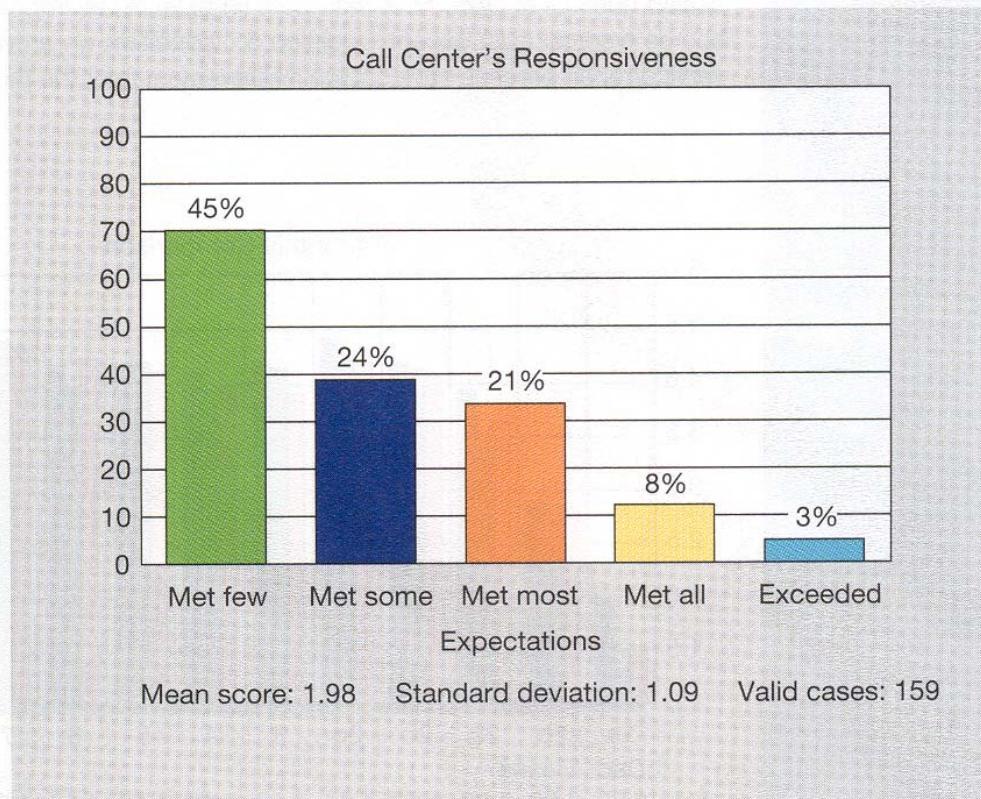
Boxplot Displays distribution(s) and compares characteristics of shape (Chapter 19).



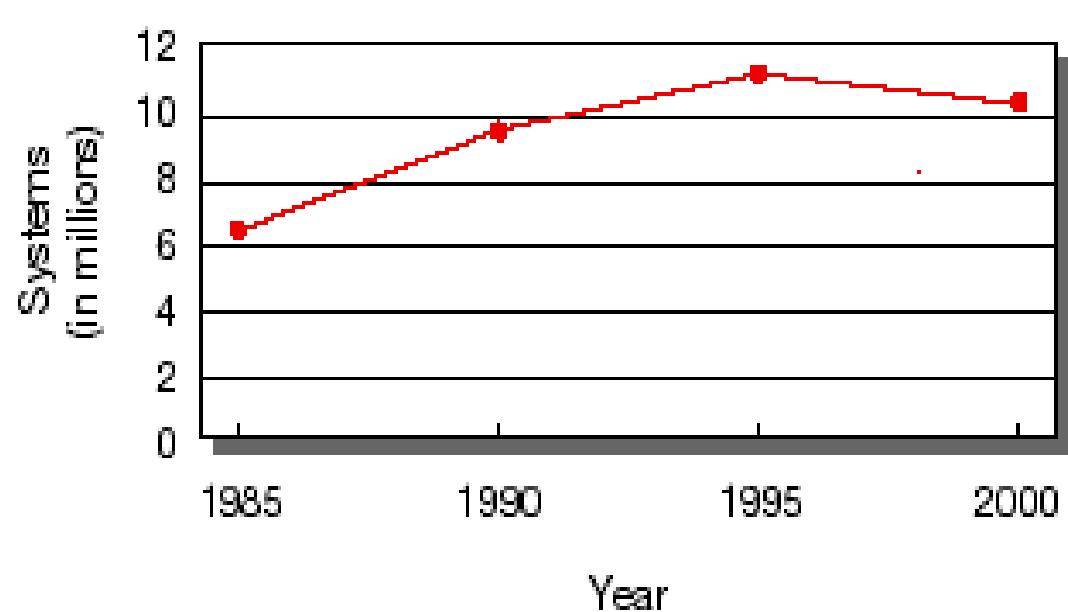
Pictograph Special chart that uses pictures or graphic elements in lieu of bars.

Sample Graphics within Report

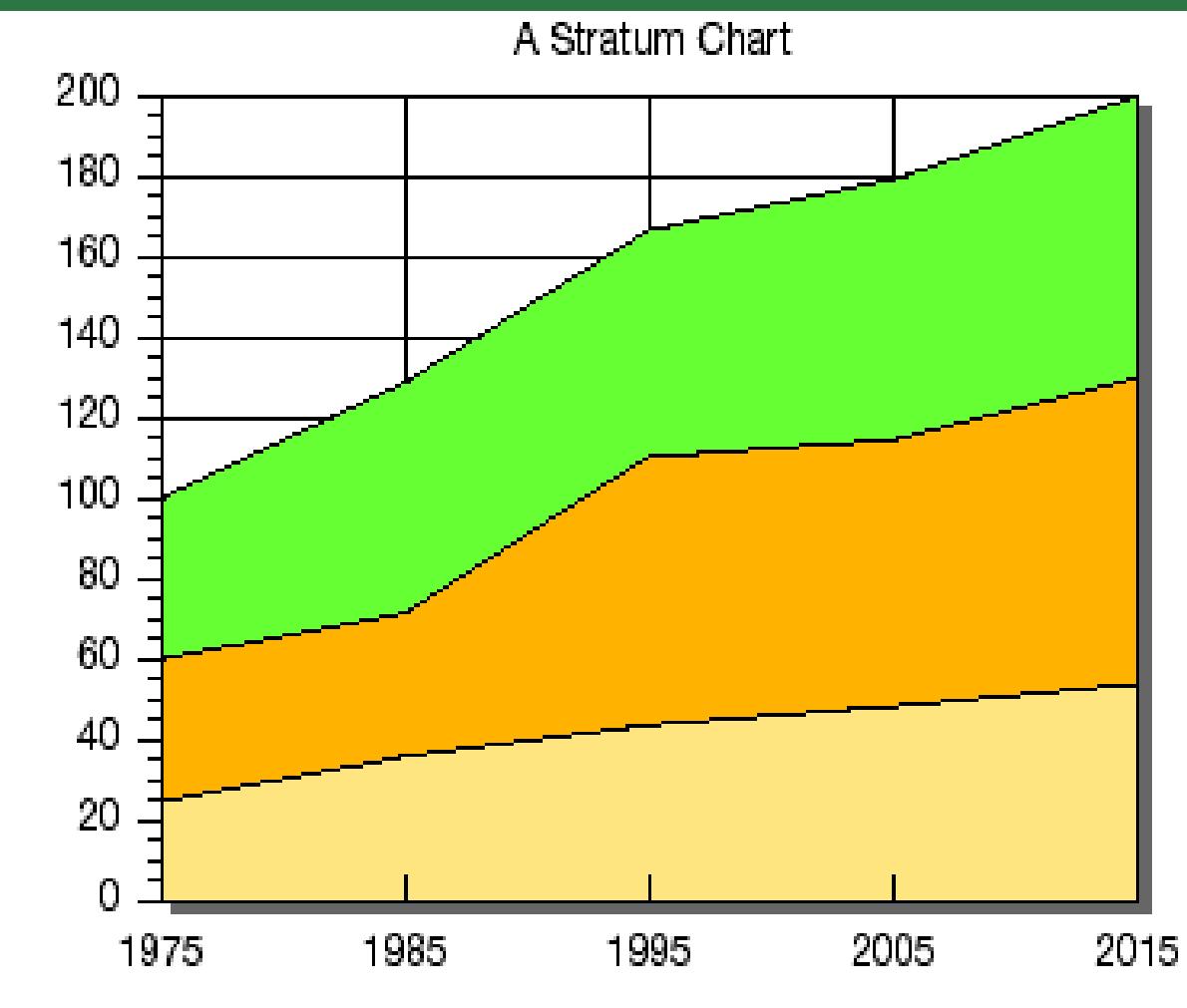
Question 1a. Call Center's Responsiveness. This question has the lowest mean score of the survey. Using a top-box method of reporting (combining the top two categories), 11 percent of the respondents felt that the Call Center met or exceeded their expectations for service responsiveness. This has improved only marginally since November and has significant implications for program targets. Based on our visit and recent results, we recommend that you begin immediately the contingency programs we discussed: additional training for Call Center operators and implementation of the proposed staffing plan.



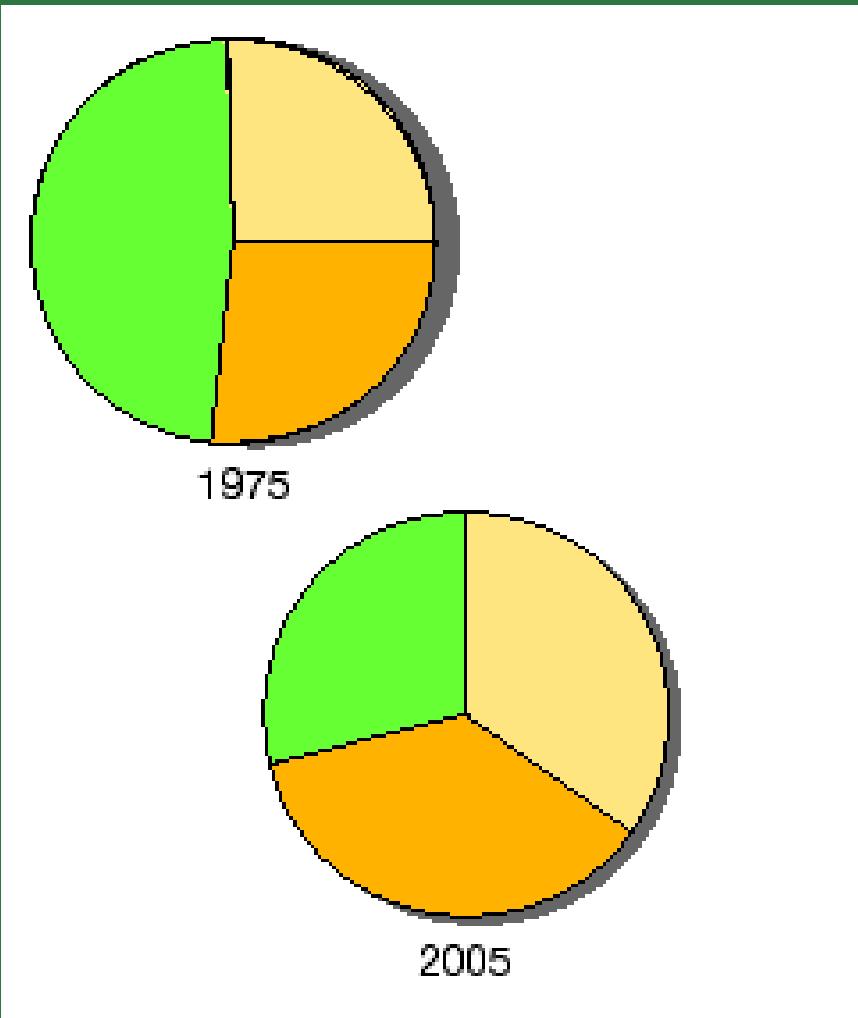
Sample Line Graph



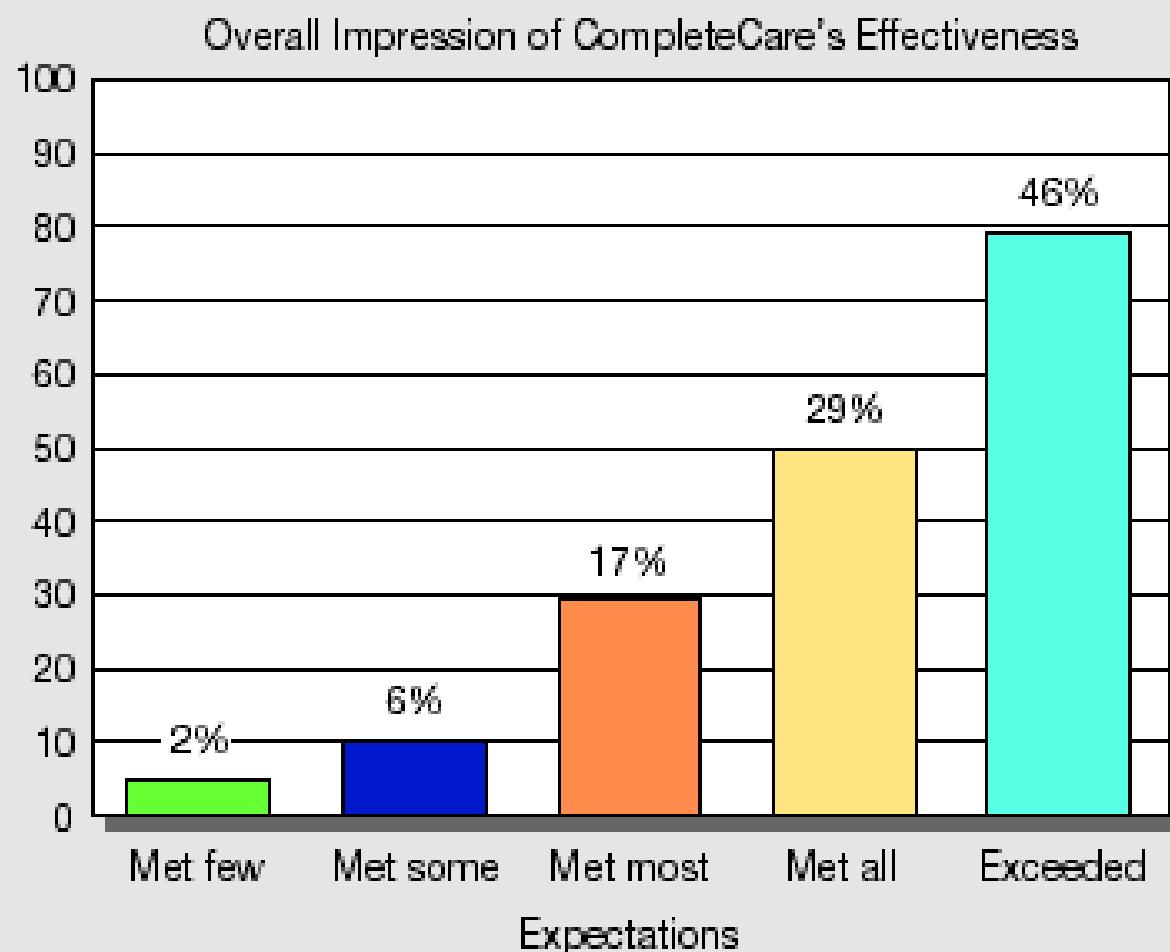
Sample Area Chart



Sample Pie Charts



Sample Bar Chart



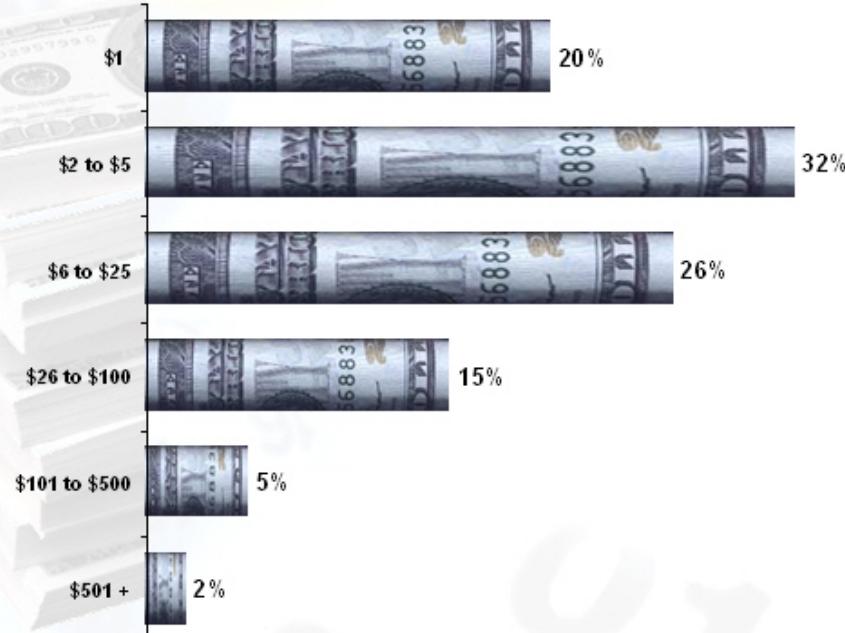
Pictograph

 marcus thomas. 

Lowest Amount To Feel Like A Winner

Q.14A

- Among those Players who do not need to hit the jackpot in order to feel like a winner, over half would be satisfied with winning \$5 or less. Another quarter of Players would be satisfied winning up to \$25. This is in line with Instant Ticket prizes, the most popular lottery game.

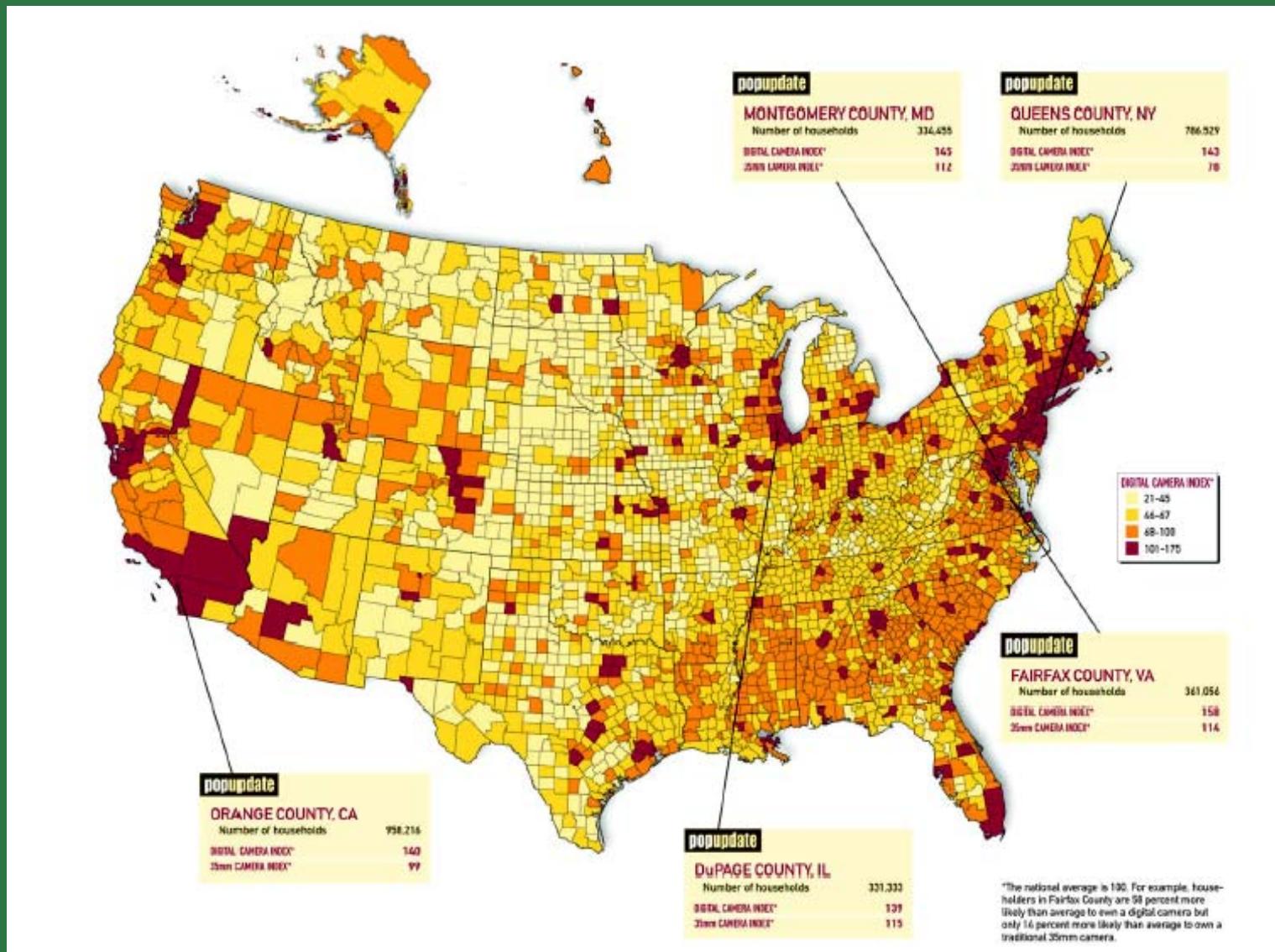


Winning Amount Range	Percentage
\$1	20%
\$2 to \$5	32%
\$6 to \$25	26%
\$26 to \$100	15%
\$101 to \$500	5%
\$501 +	2%

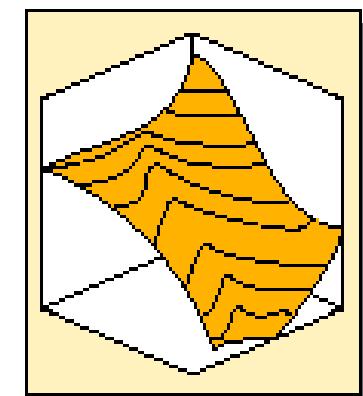
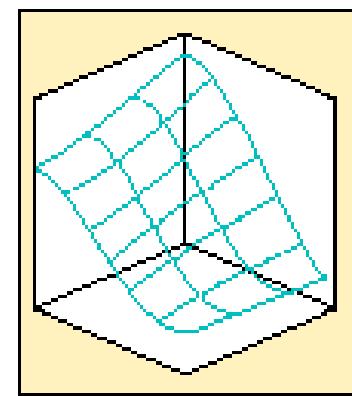
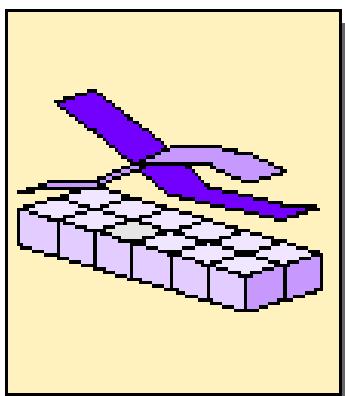
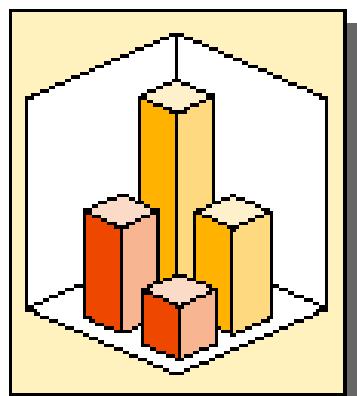
Base: Players Who Consider Winning Less Than The Jackpot A Win (1,048)

0  Ohio Lottery Segmentation Study (October 2005)

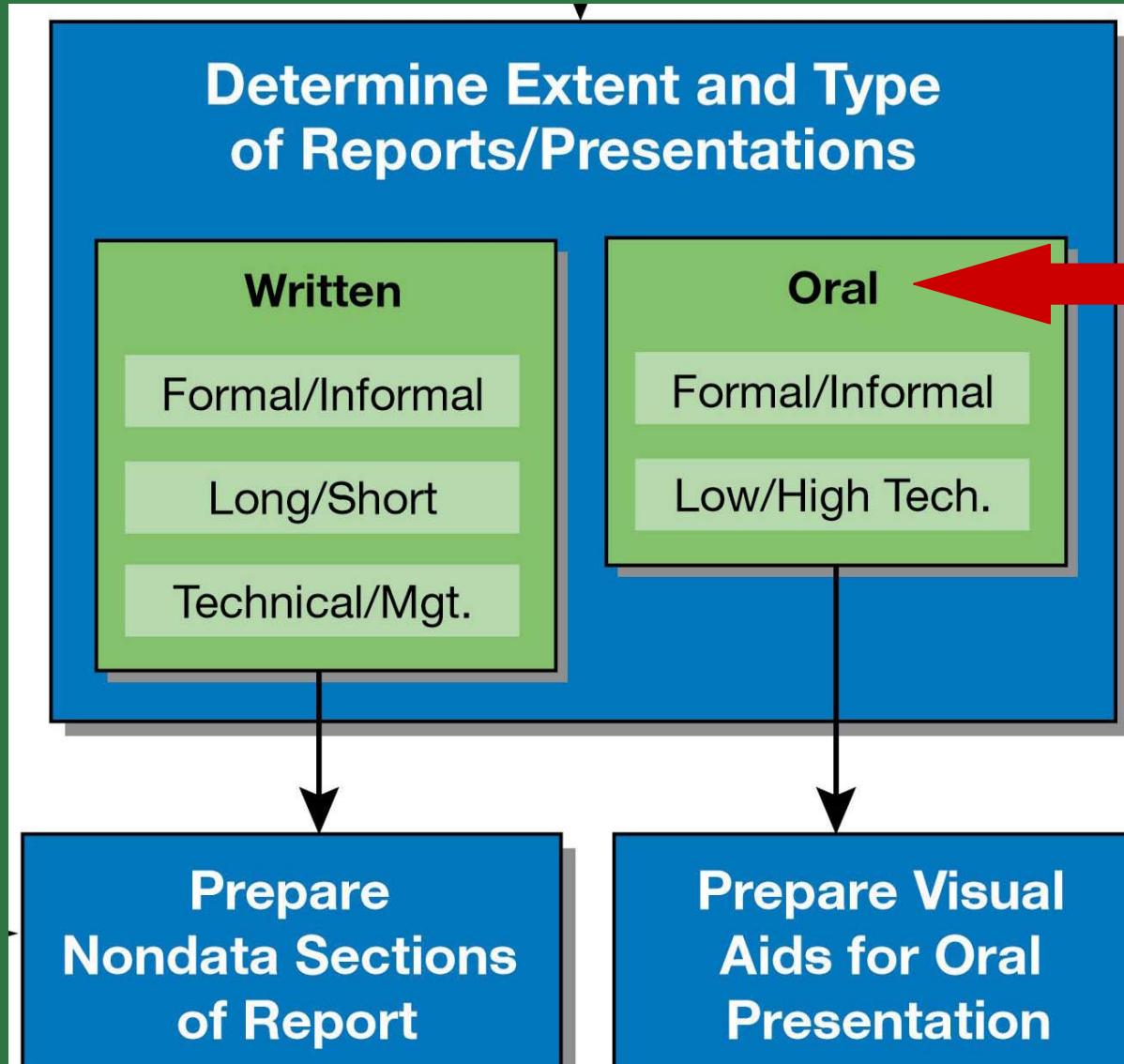
Geographies



3-D Graphs



The Oral Report



The Oral Report

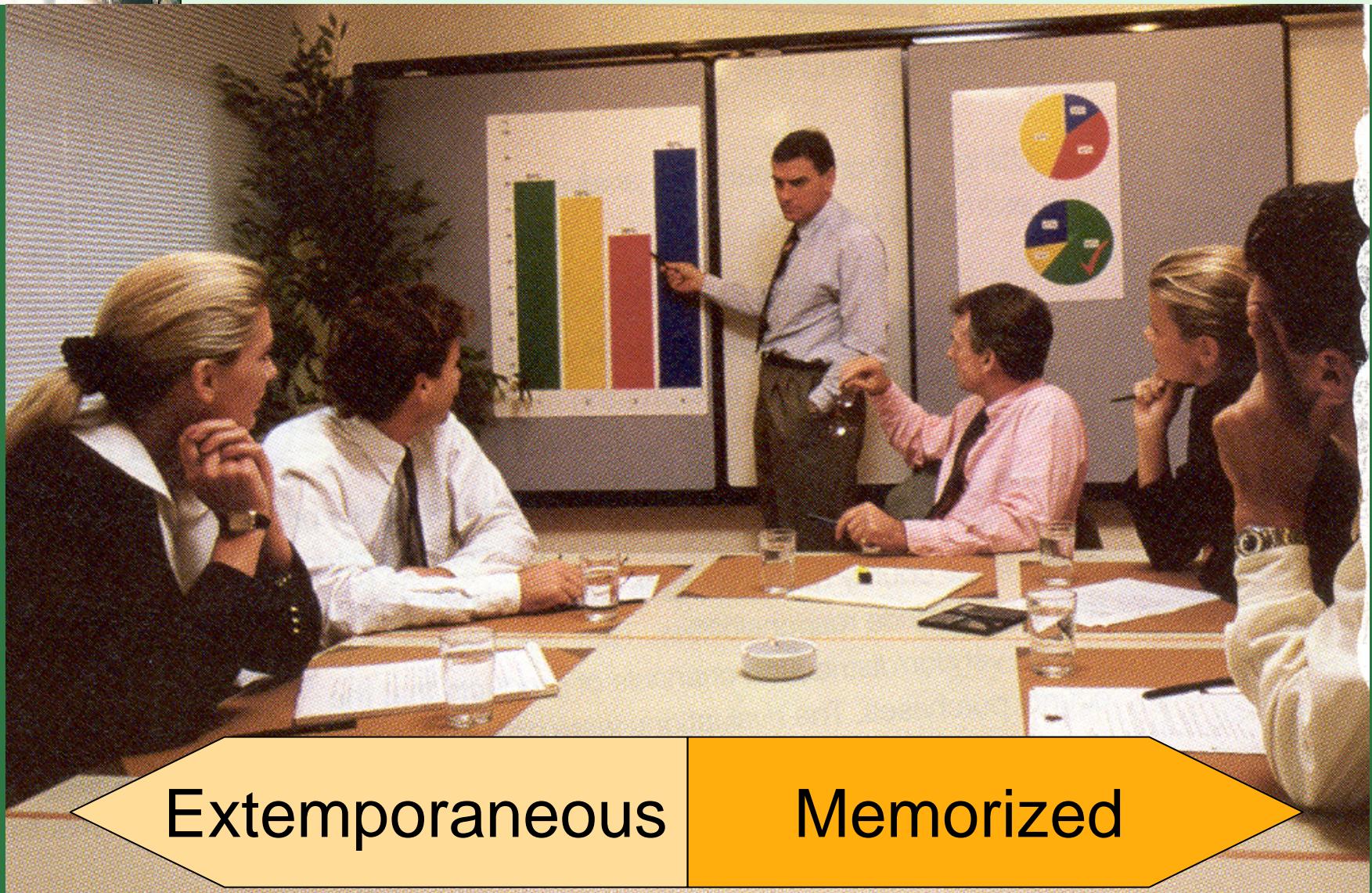


Opening

Findings and
conclusions

Recommendations

Presentation Type



Extemporaneous

Memorized



Speaker Characteristics

Vocal

- Do you speak softly?
- Do you speak too rapidly?
- Do you vary volume, tone, and rate of speaking?
- Do you fill pauses (e.g., you know, uhm, ah)?

Physical

- Do you rock back and forth?
- Do you fiddle with things?
- Do you stare into space?
- Do you misuse visuals?

Audiovisuals



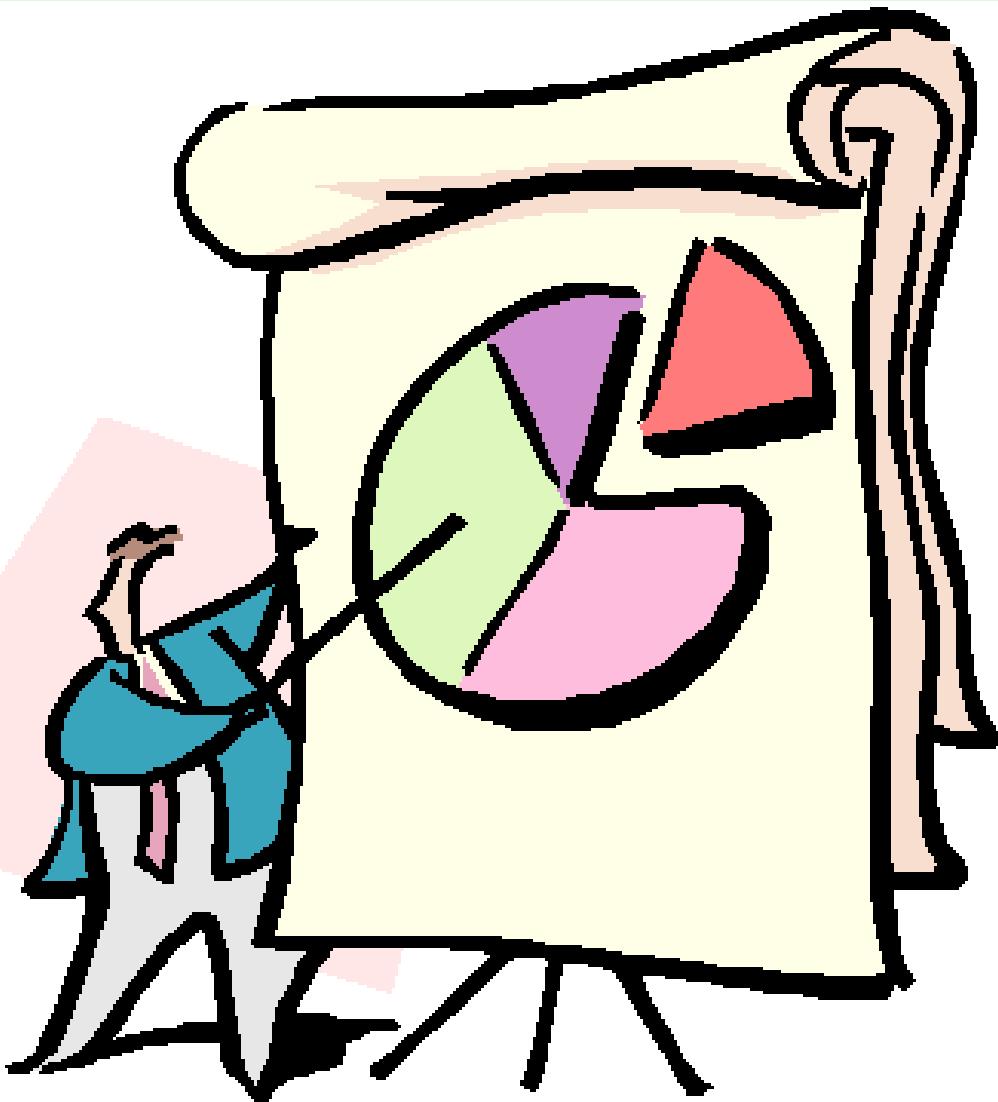
High Tech

- Computer-drawn visuals
- Computer animation
- Computer with embedded video and audio clips

Audiovisuals

Low Tech

- Chalkboard/
Whiteboard
- Handouts
- Flip charts
- Overhead
transparencies
- Slides



Key Terms

- Area chart
- Bar chart
- Briefing
- Executive summary
- Extemporaneous presentation
- Geographic chart
- Letter of transmittal
- Line graph
- Management report
- Pace
- Pictograph
- Pie chart
- Readability index
- Sentence outline
- Technical report
- 3-D graphic
- Topic outline