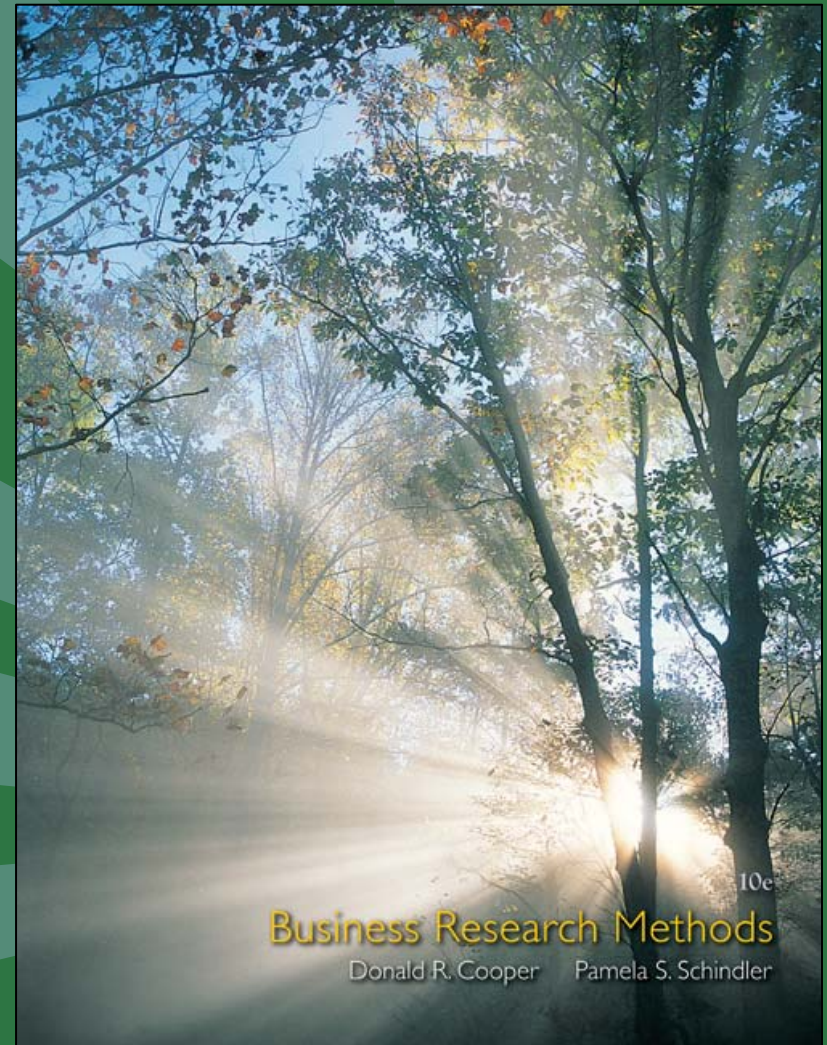



Chapter 1

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.



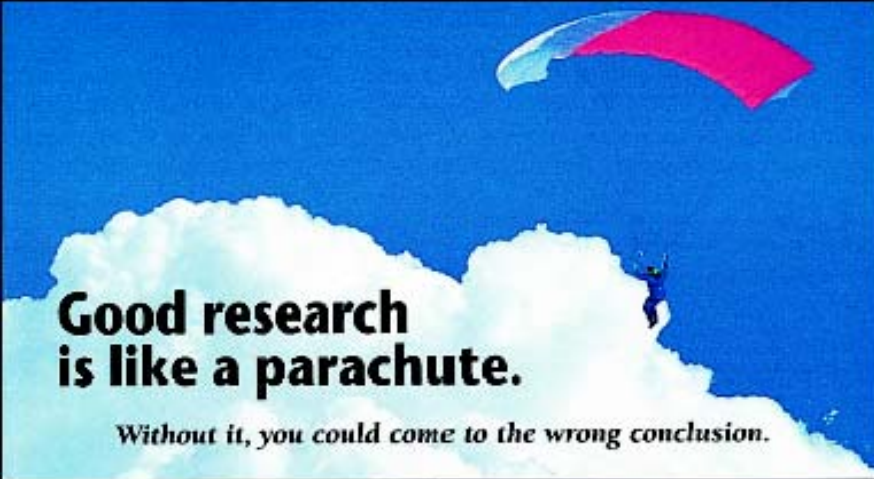
PulsePoint: Research Revelations

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

A person is shown jumping off a white cliff edge into a bright blue sky. A large, colorful parachute (pink and blue) is deployed above them. The scene is set against a backdrop of white clouds.

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 Frattaroli toll free at 877-JRP-2055 and ask about our full range of services.

JRP
MARKETING
RESEARCH SERVICES
INC.

309 GRANITE DRIVE, MIDDLETOWN, PA 19663-3514
877 JRP-2055 610 565-8840
FAX 610 565-8878 jrp@jrpresearch.net



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.

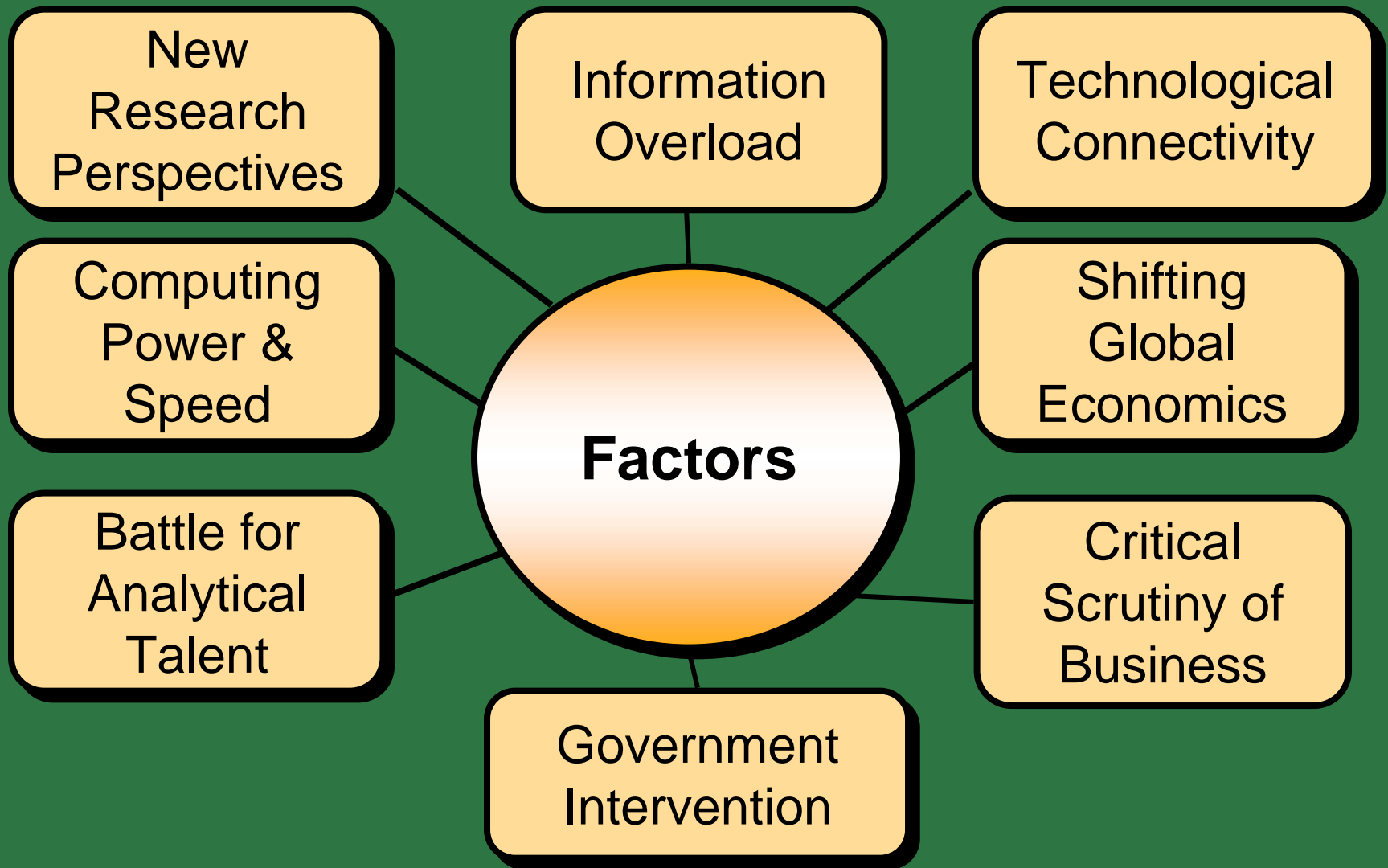
www.greenfield.com 888.291.9997

Greenfield Online

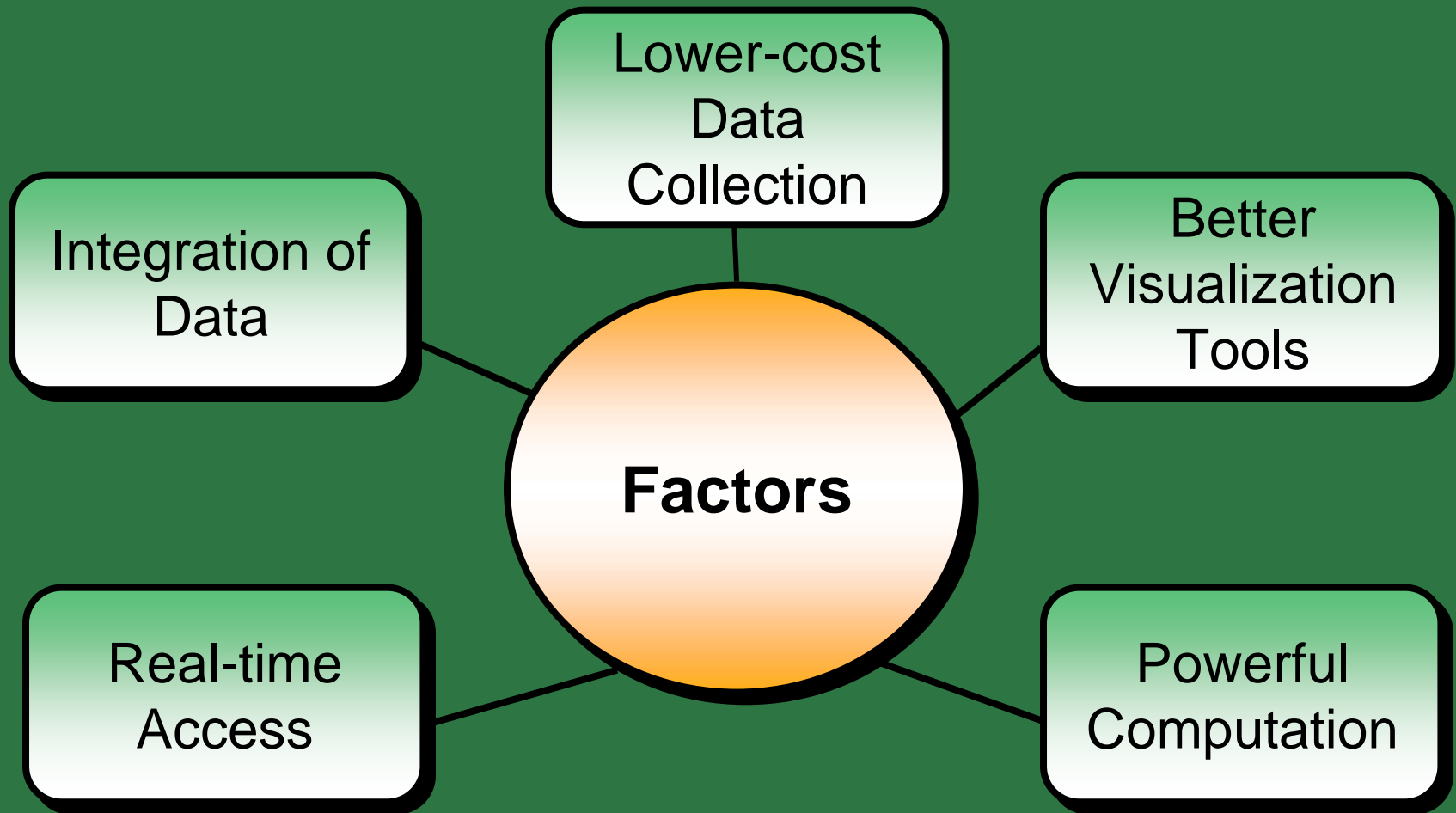
Leading the Research Revolution®



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

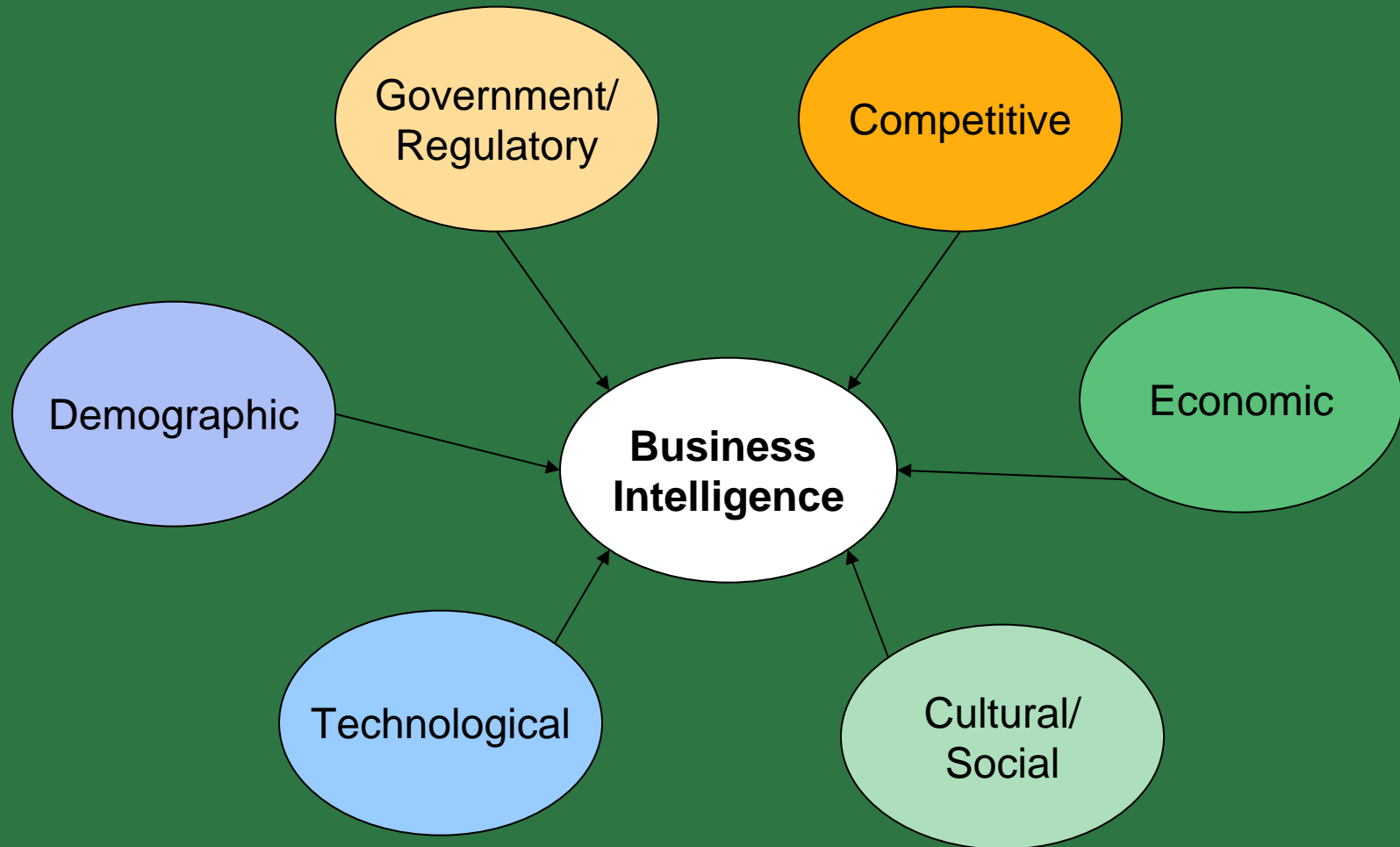
Decision Support Systems

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

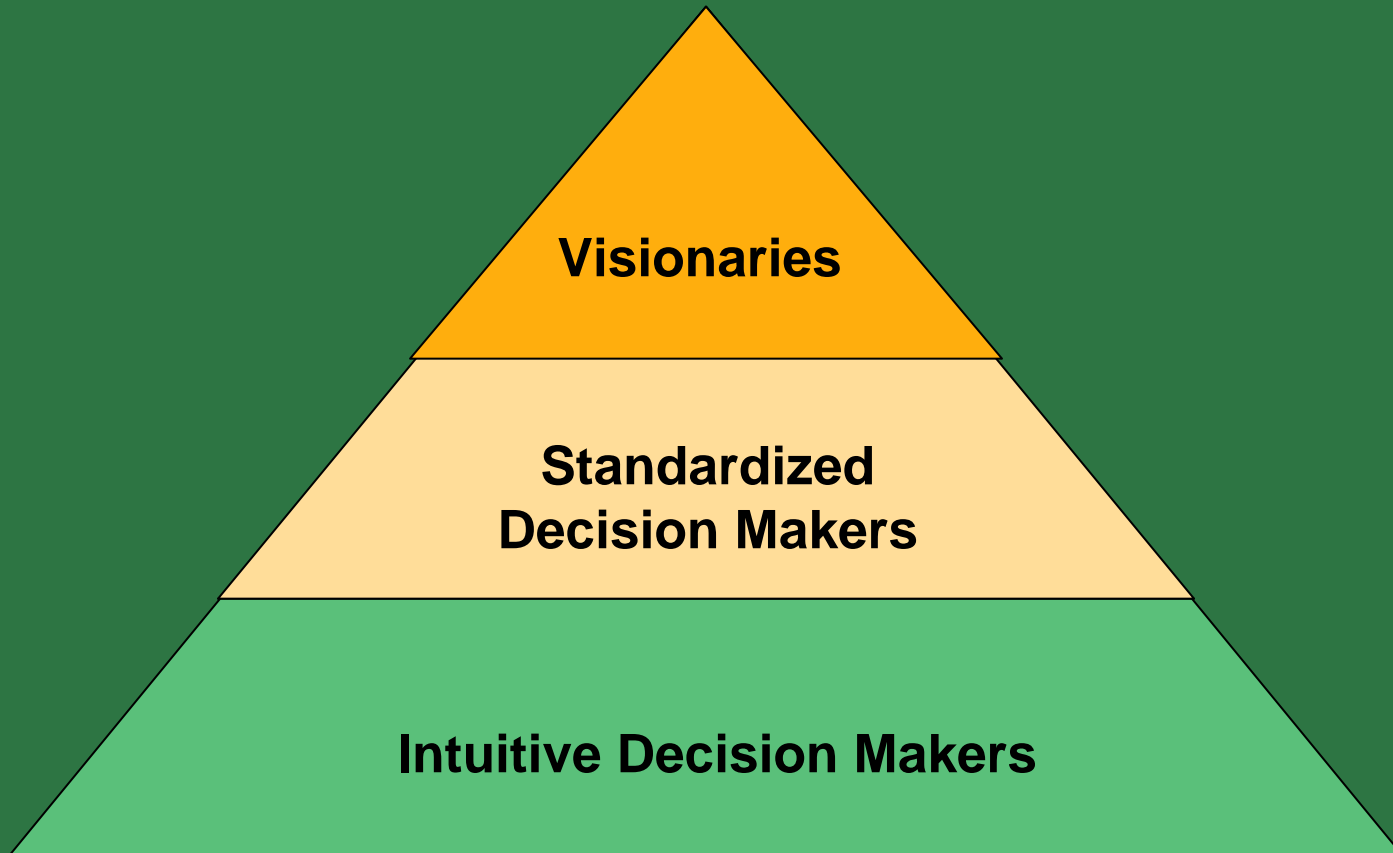
Business Intelligence Systems

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

Sources of Business Intelligence



Hierarchy of Business Decision Makers

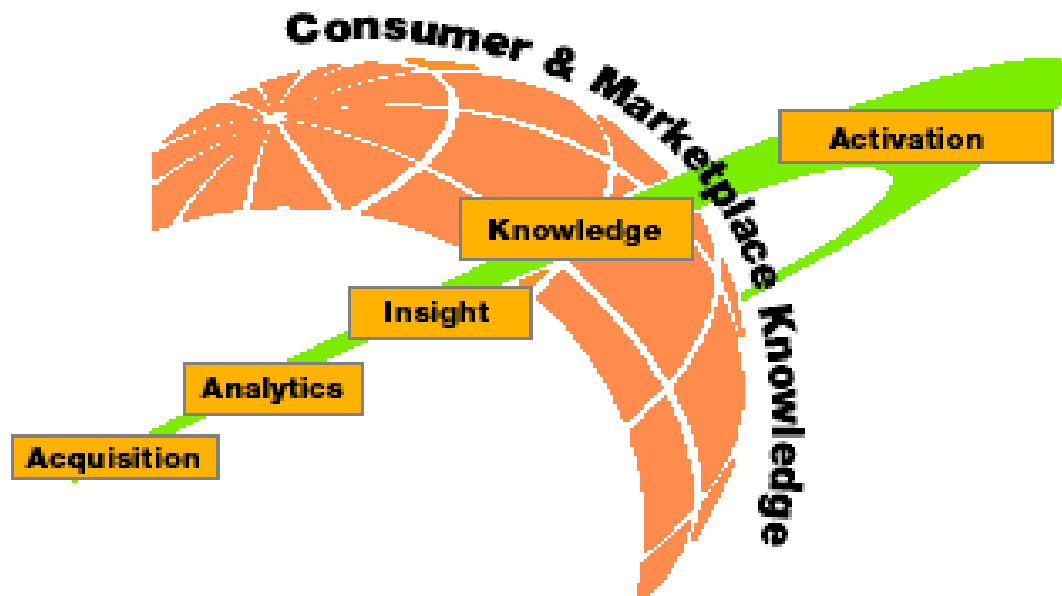


Minute Main and Business Research

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



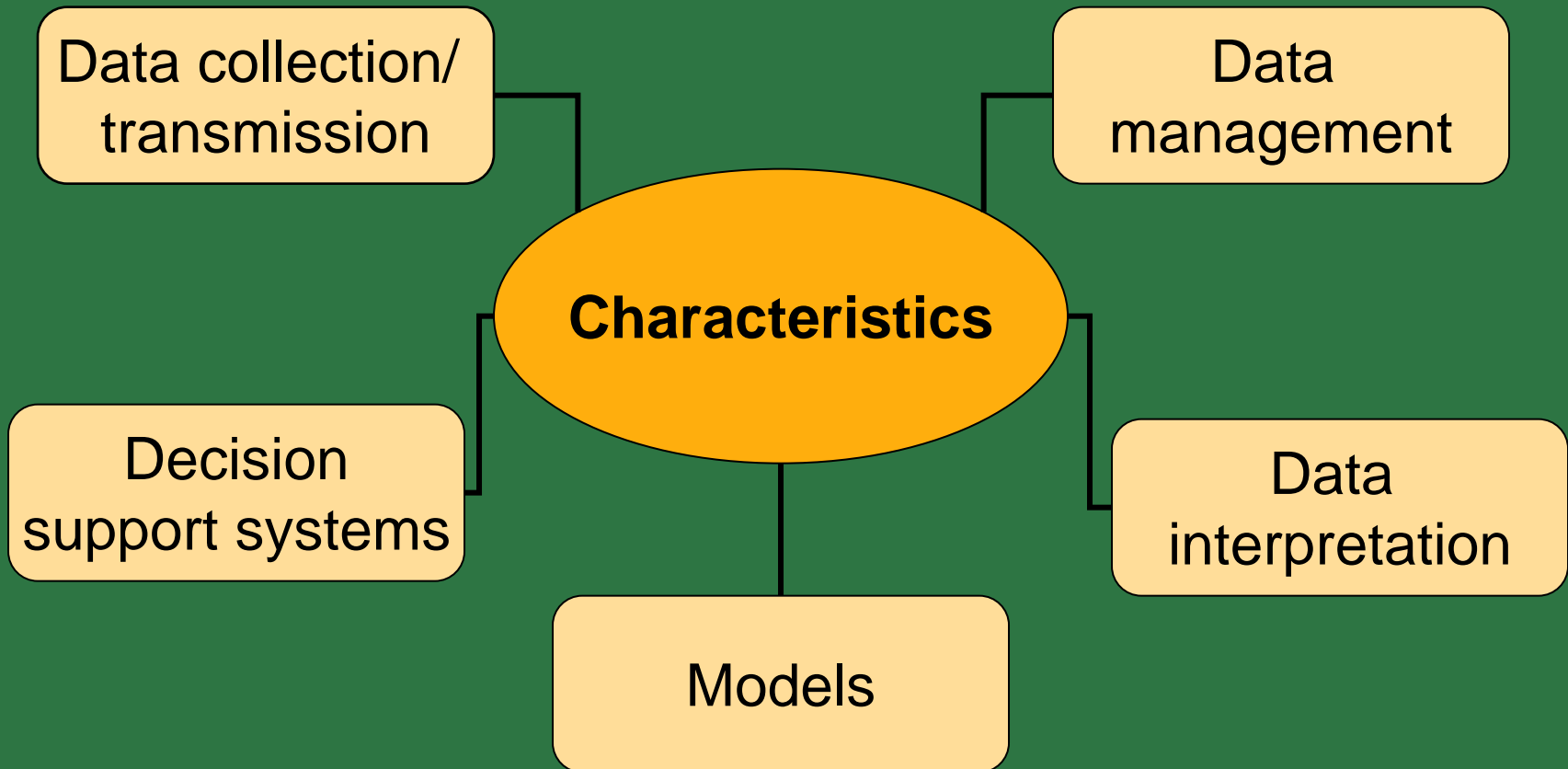


Research May Not Be Necessary

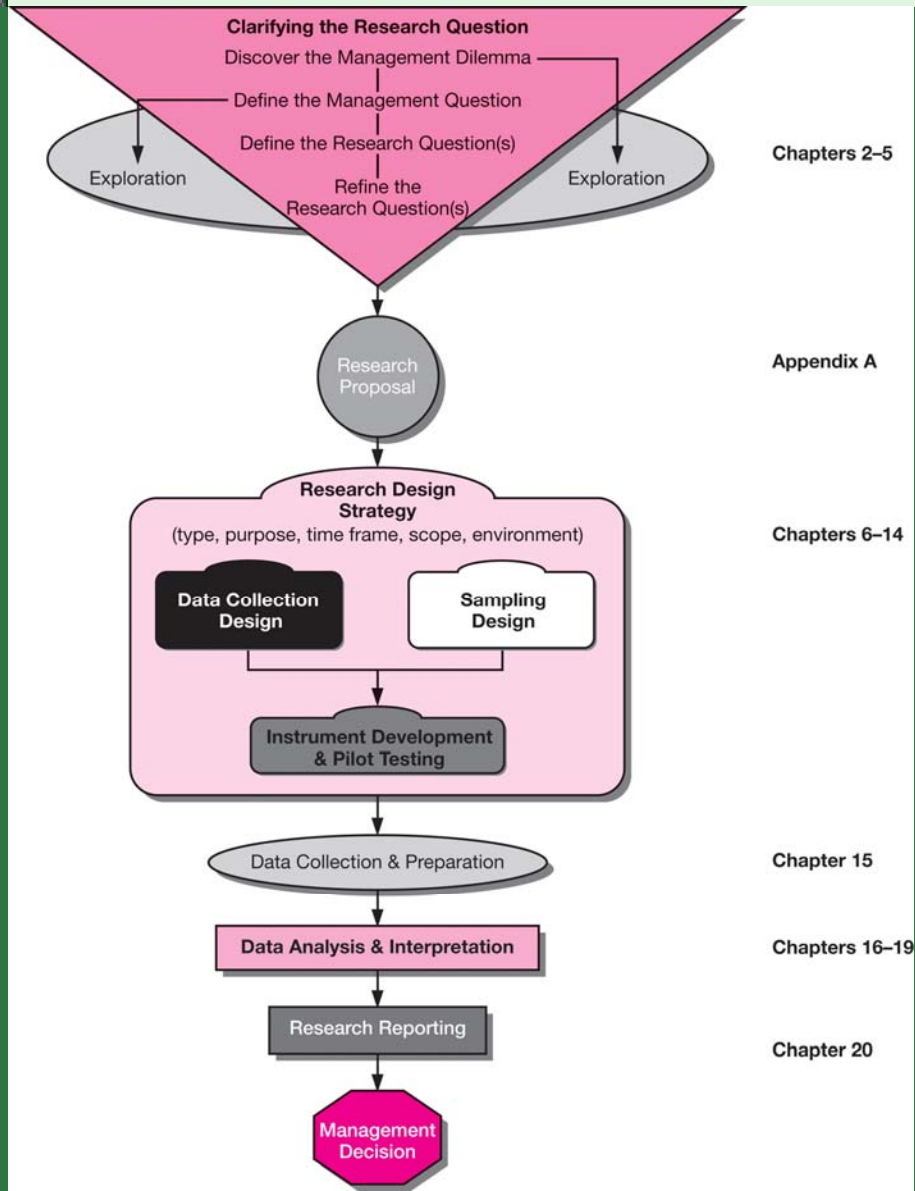
Can It Pass These Tests?

- 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

The diagram consists of two orange octagons with a white-to-orange gradient, positioned side-by-side on a dark green background. The left octagon contains the word 'Applied' and the right octagon contains the text 'Basic (Pure)'. Both are written in a bold, dark red font.

Basic (Pure)

Four Types of Studies



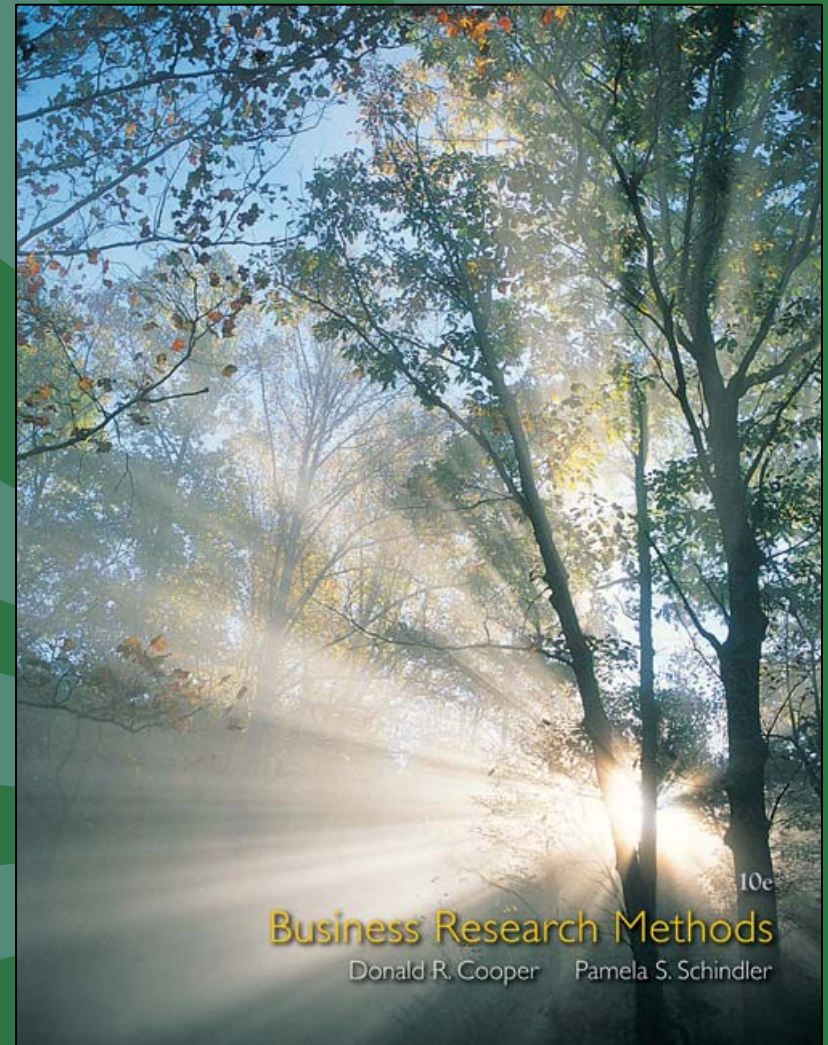


Key Terms

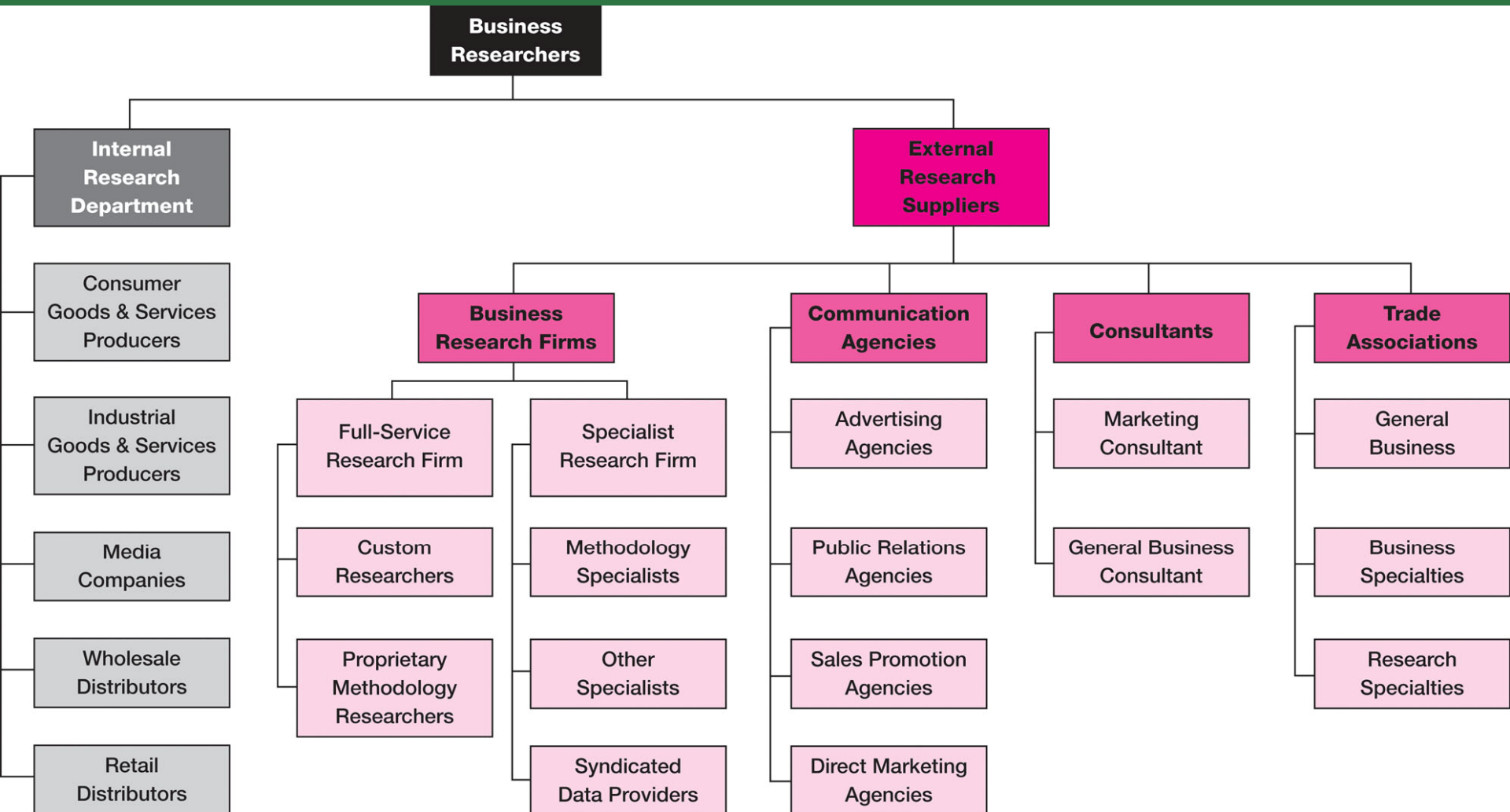
- | | |
|---|---|
| <ul style="list-style-type: none">• Applied research• Business intelligence system (BIS)• Business research• Control• Decision support system• Descriptive studies• Explanatory Studies | <ul style="list-style-type: none">• Management dilemma• Predictive studies• Pure research• Reporting studies• Return on Investment (ROI)• Scientific method• Strategy• Tactics |
|---|---|

Appendix 1a

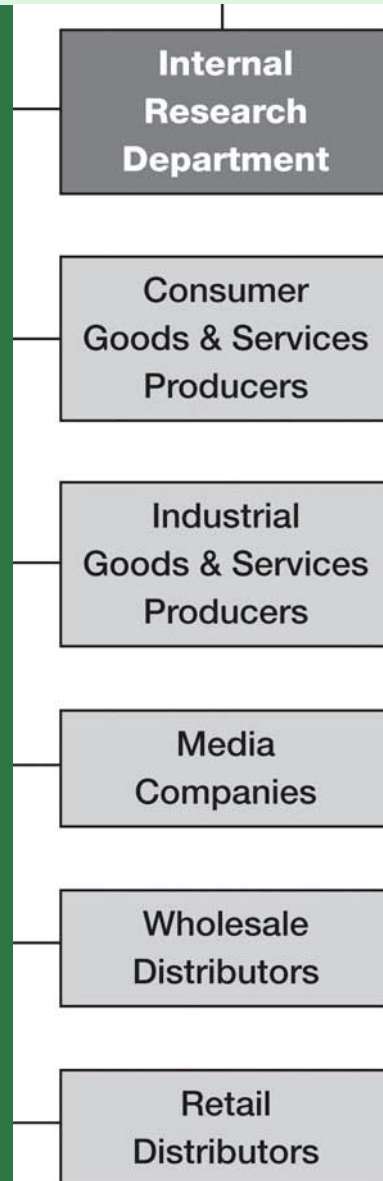
How the Research Industry Works



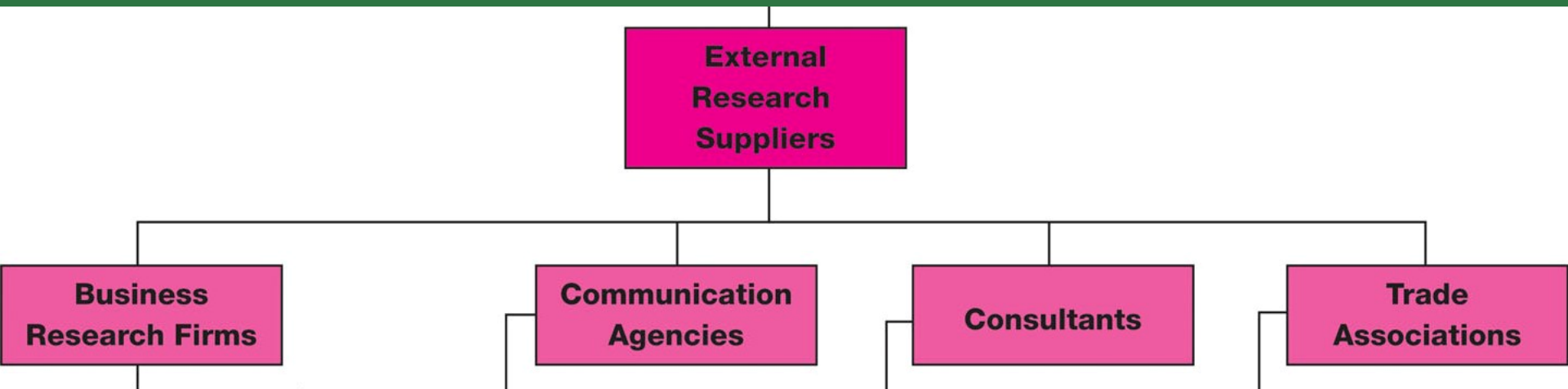
Who Conducts Business Research?



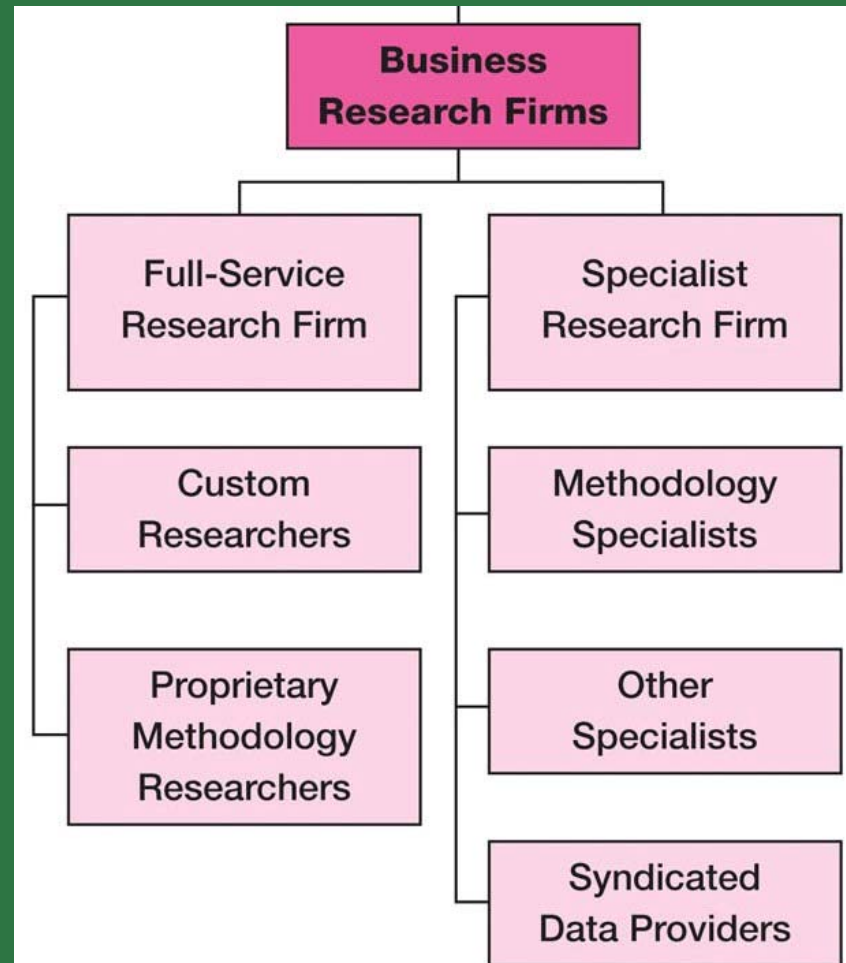
Some Organizations Use Internal Research Sources



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-demand analysis to help determine optimal pricing.
- Target market refinement to improve advertising media focus.
- Suite of econometric models to predict your new sales.

We have over 3,500,000 consumers in our suite of worldwide Internet panels ready to evaluate your new product ideas. Let us help you improve your new product research systems.

Call 1-811-460-6166
or visit: www.decisionanalyst.com

 **Decision Analyst**
The global leader in analytical research systems

Use Free 30-Day trial period before purchase of Conceptor Online Concept Testing system. ©2001 Decision Analyst, Inc.

*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 sales parking this car

Most people would answer B. Truth is, Court TV viewers are a lot more upscale than you'd think. Our demos are comparable to ABC, Discovery and TLC. With a lineup that includes intelligent, compelling dramas as well as gripping, original documentaries, there's just about everything keeping this most elite audience. Call the Bureau at 1-800-8-NEWS.

© 2000 Court TV, Inc. All rights reserved.
© 2000 American Investigation Network, Inc.

COURT TV 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

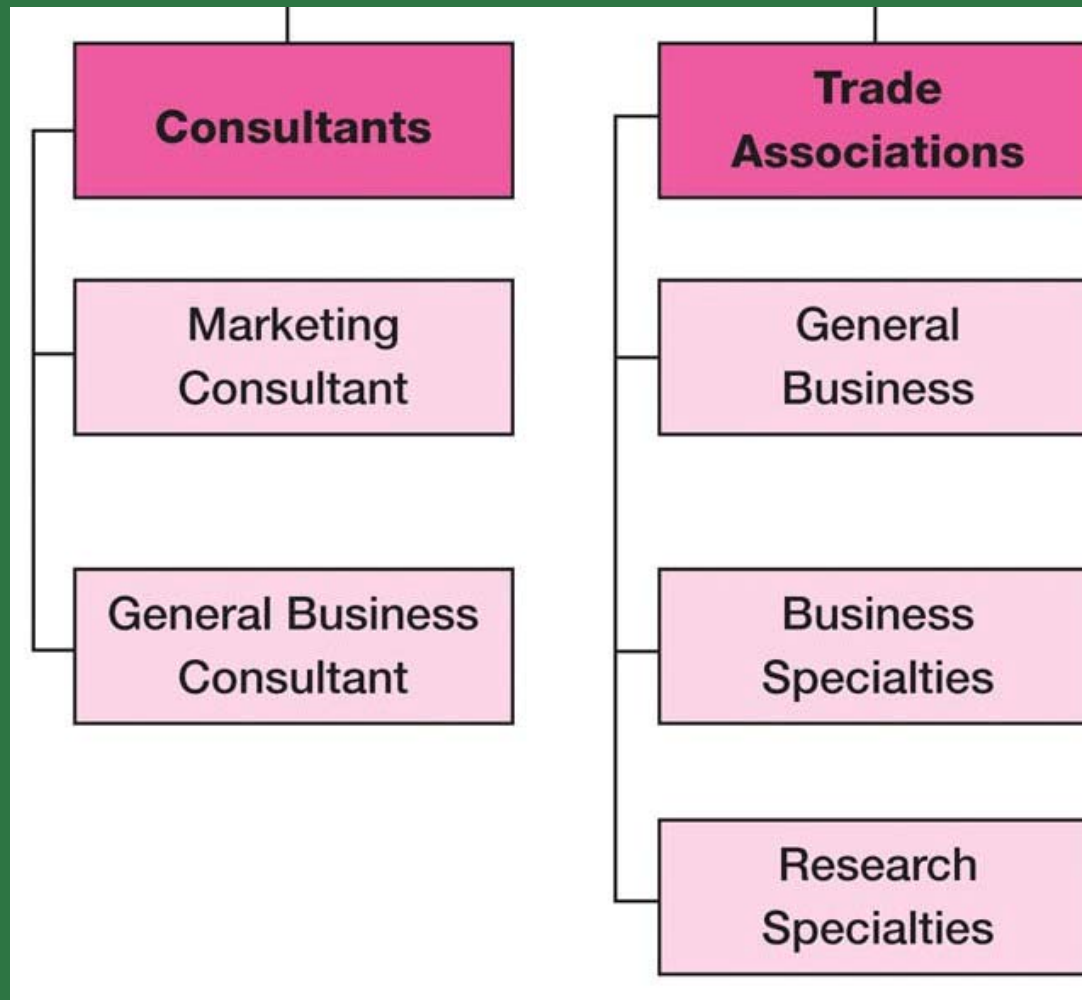
Geographic Region



Communication Agencies



Consultants and Trade Associations



Trade Associations



NHRA

CASRO

MRA

ESOMAR

BRA

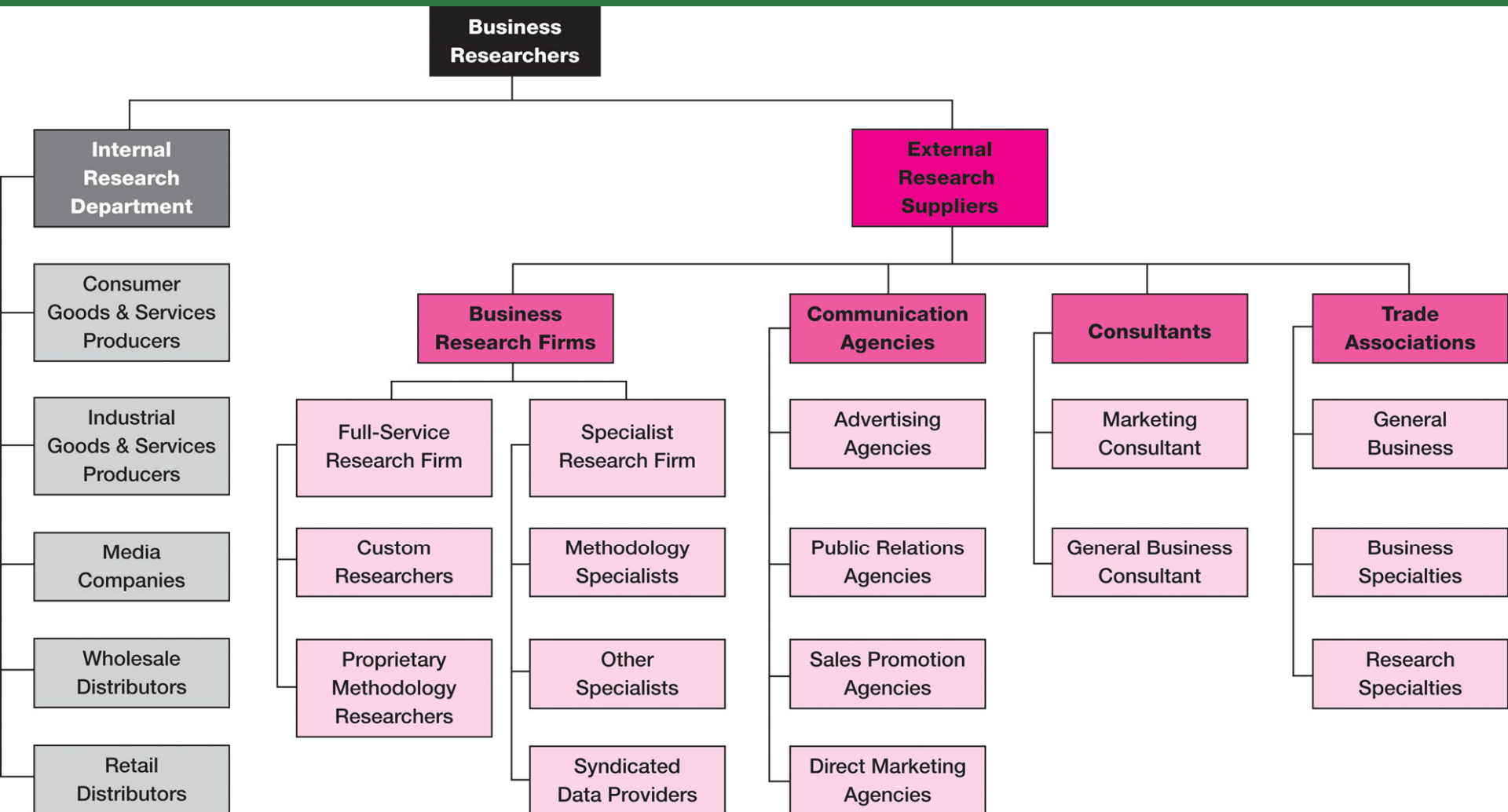
AMA


WAOBRP

MPA

NAB

Many Firms Conduct Research



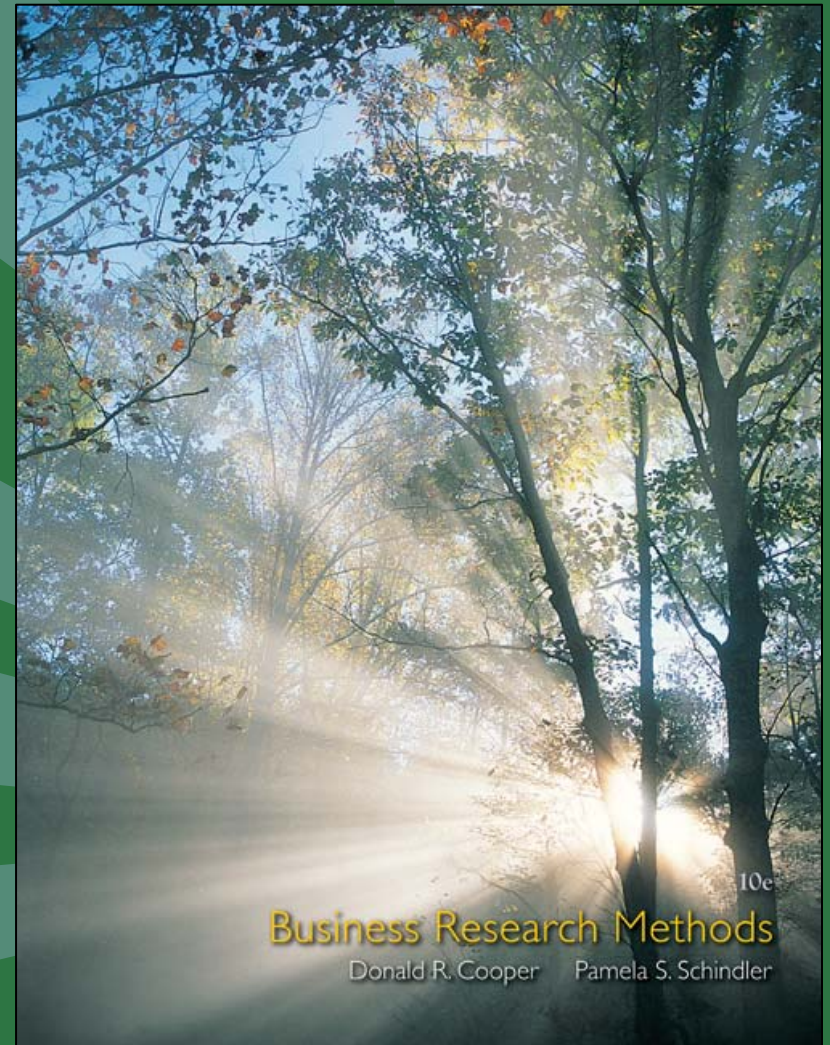


Key Terms

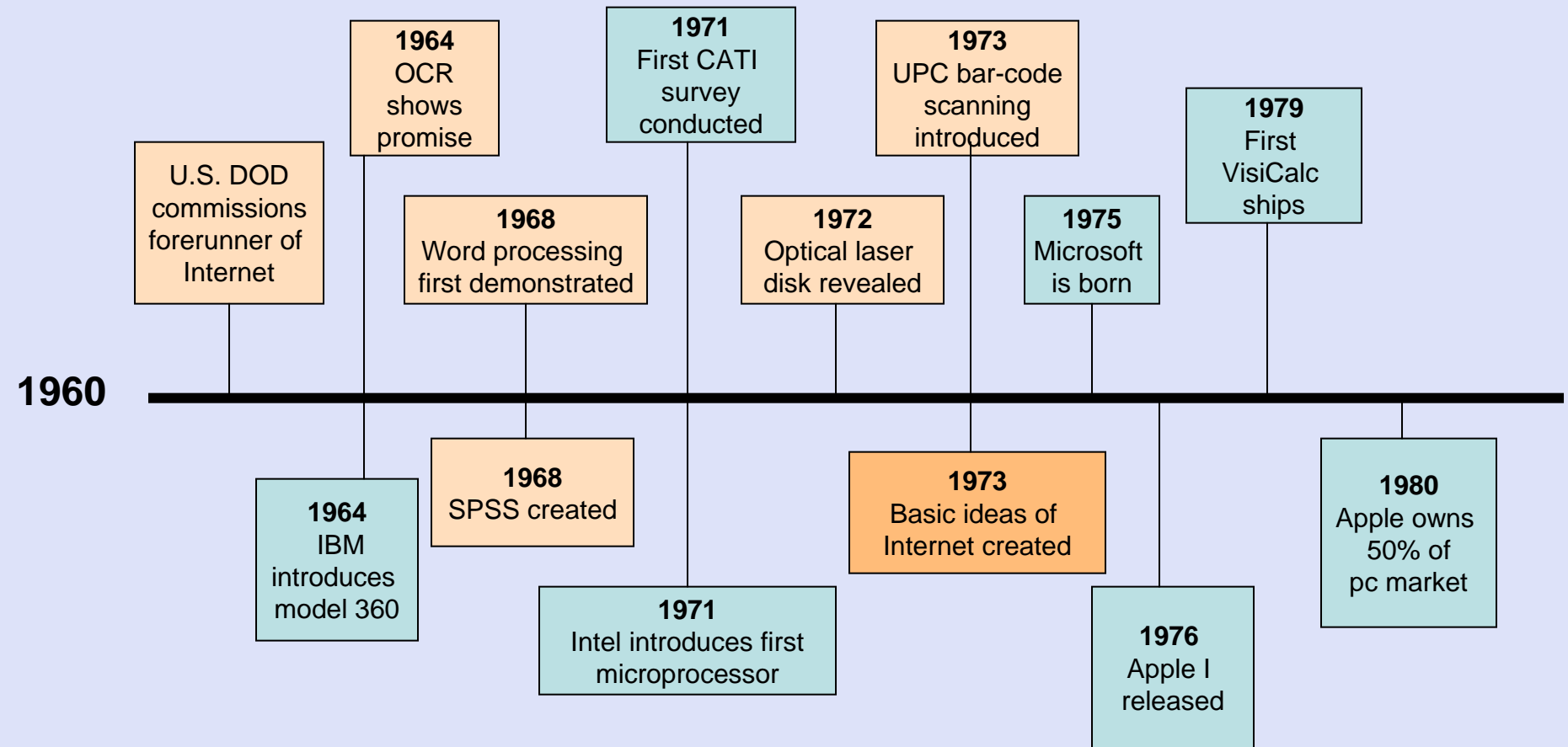
- Custom Researcher
- Full-service researcher
- Specialty researcher
- Syndicated data provider
- Omnibus researcher
- Omnibus study

Chapter 1 Addendum

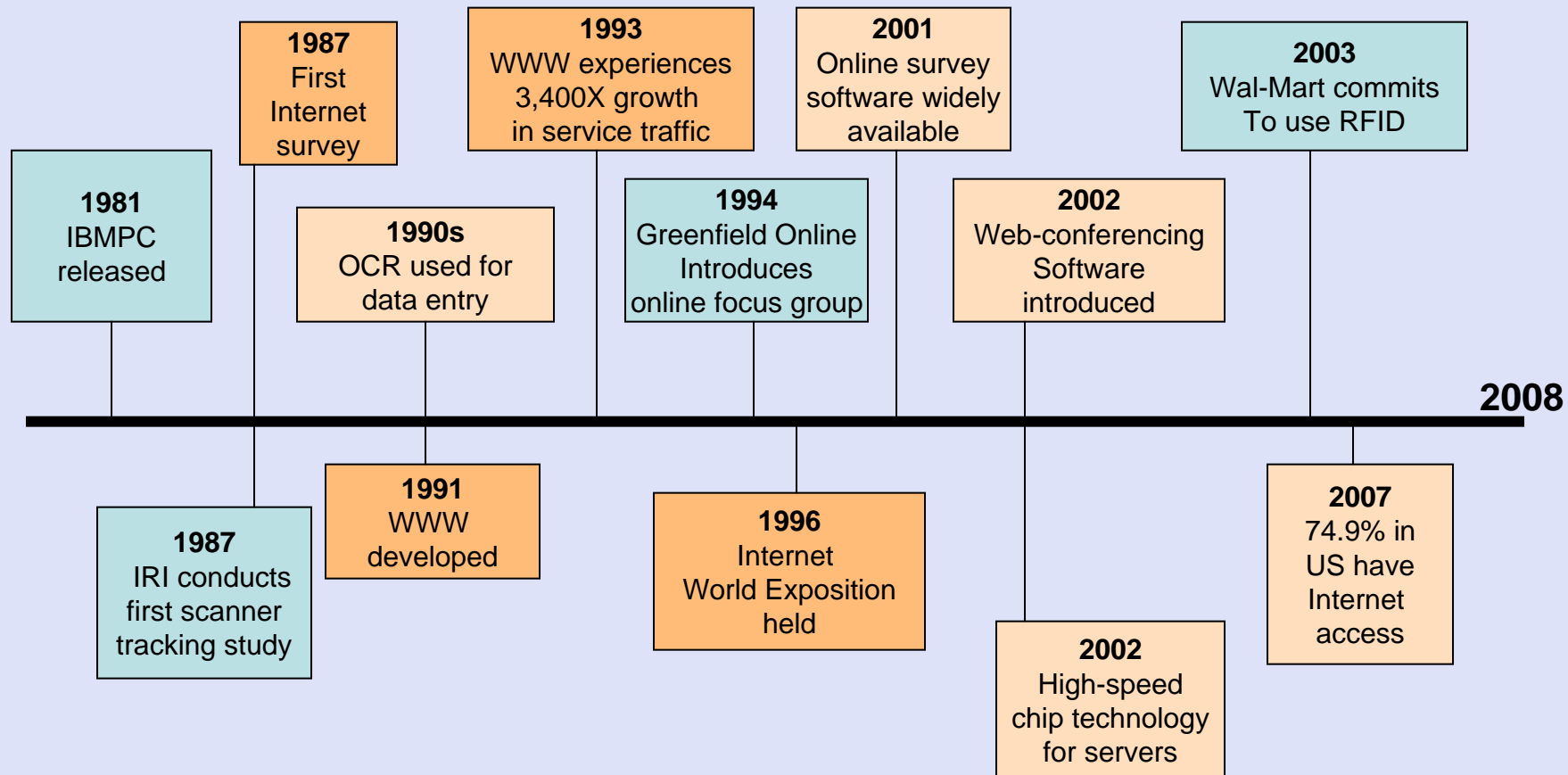
Research Timeline



Information Revolution

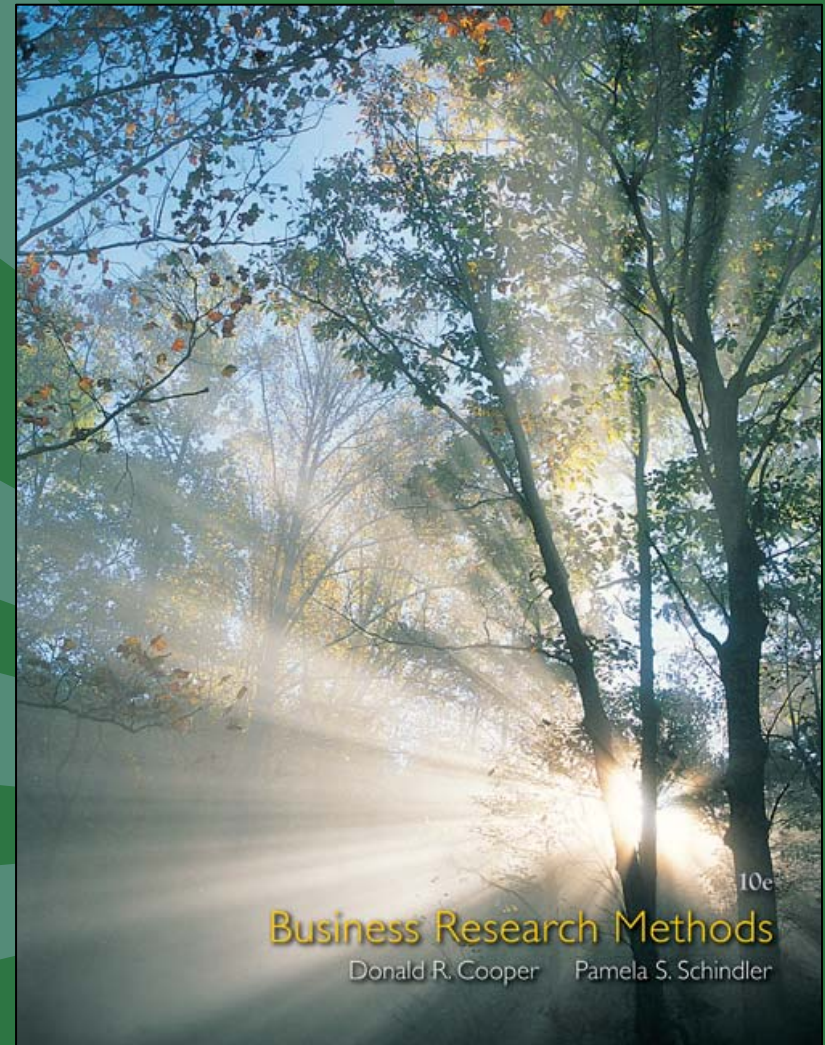



Information Revolution



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

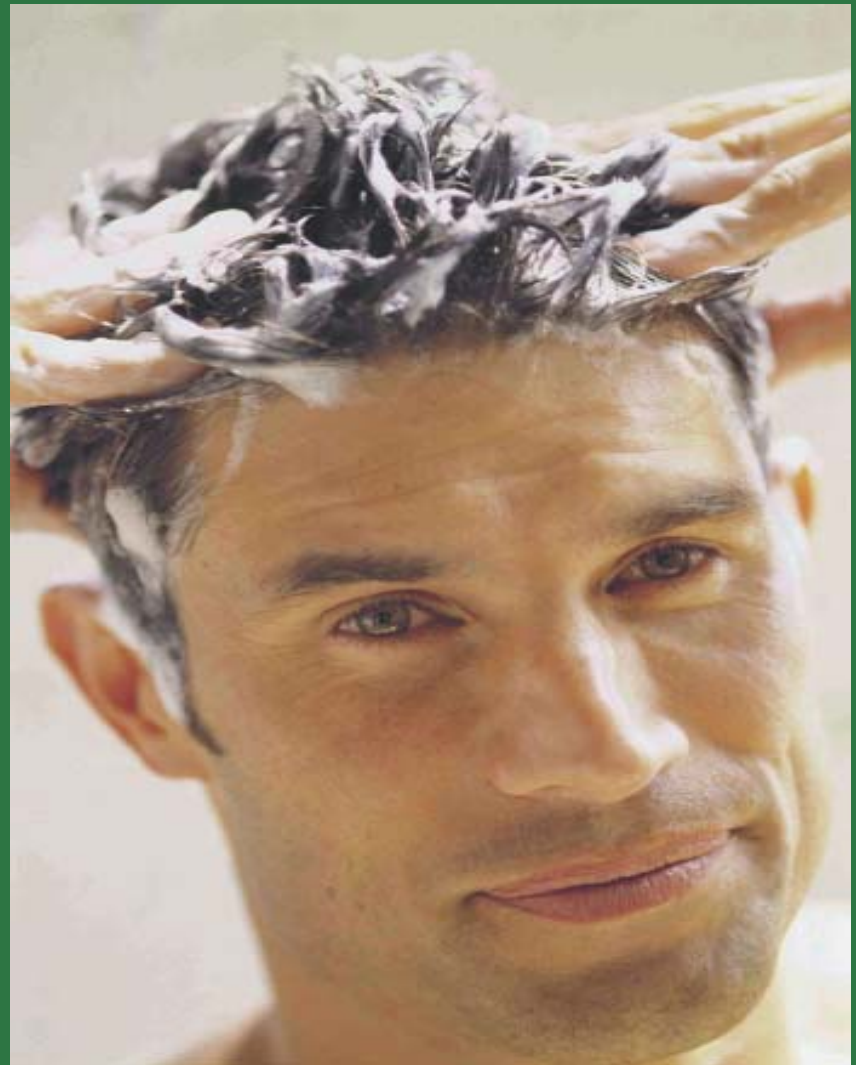
Deceiving
participants

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



ARENA ®
APPLIED RESEARCH ETHICS
NATIONAL ASSOCIATION

epic.org

Advancing the Business of Research


CASRO®

COUNCIL OF AMERICAN SURVEY RESEARCH ORGANIZATIONS®



MarketingPower.com



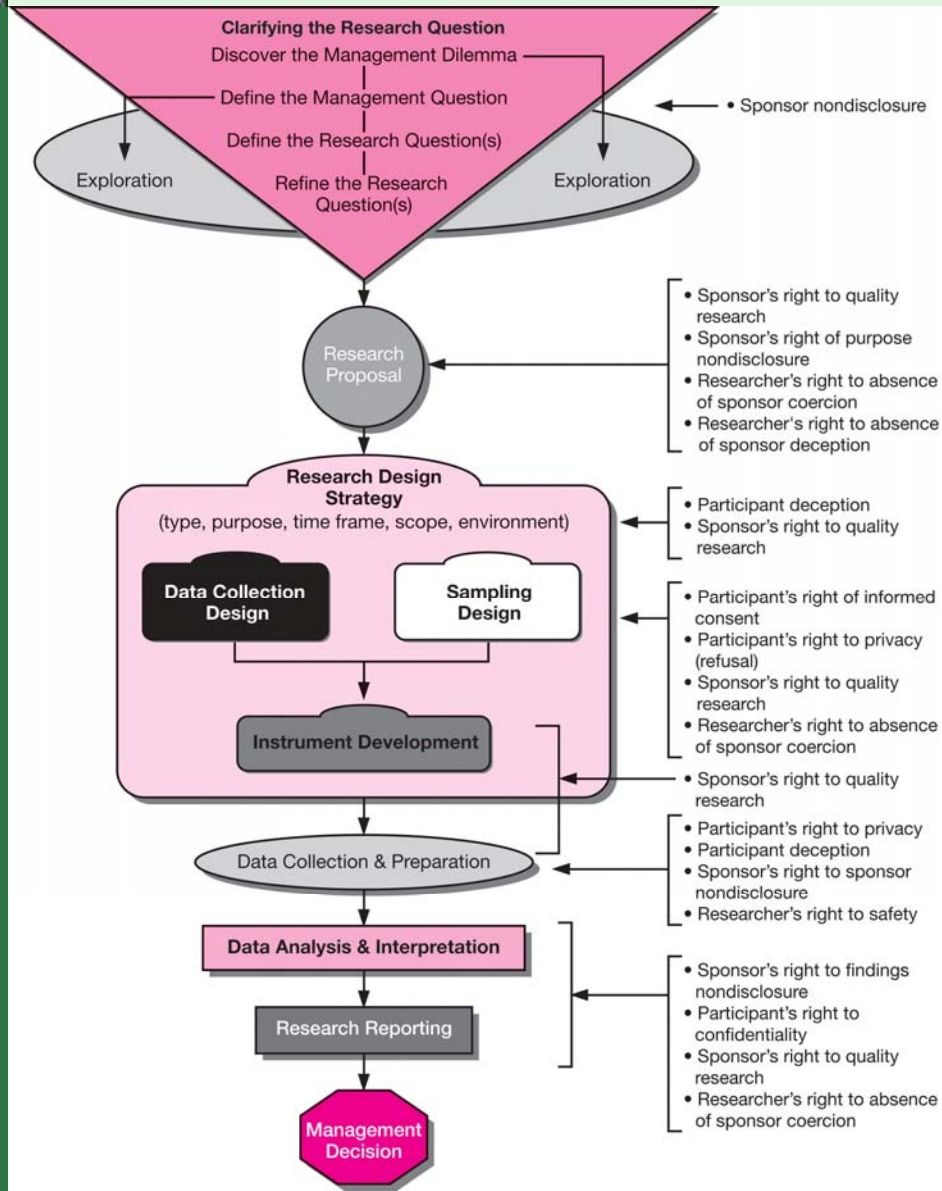


PulsePoint: Research Revelation

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**

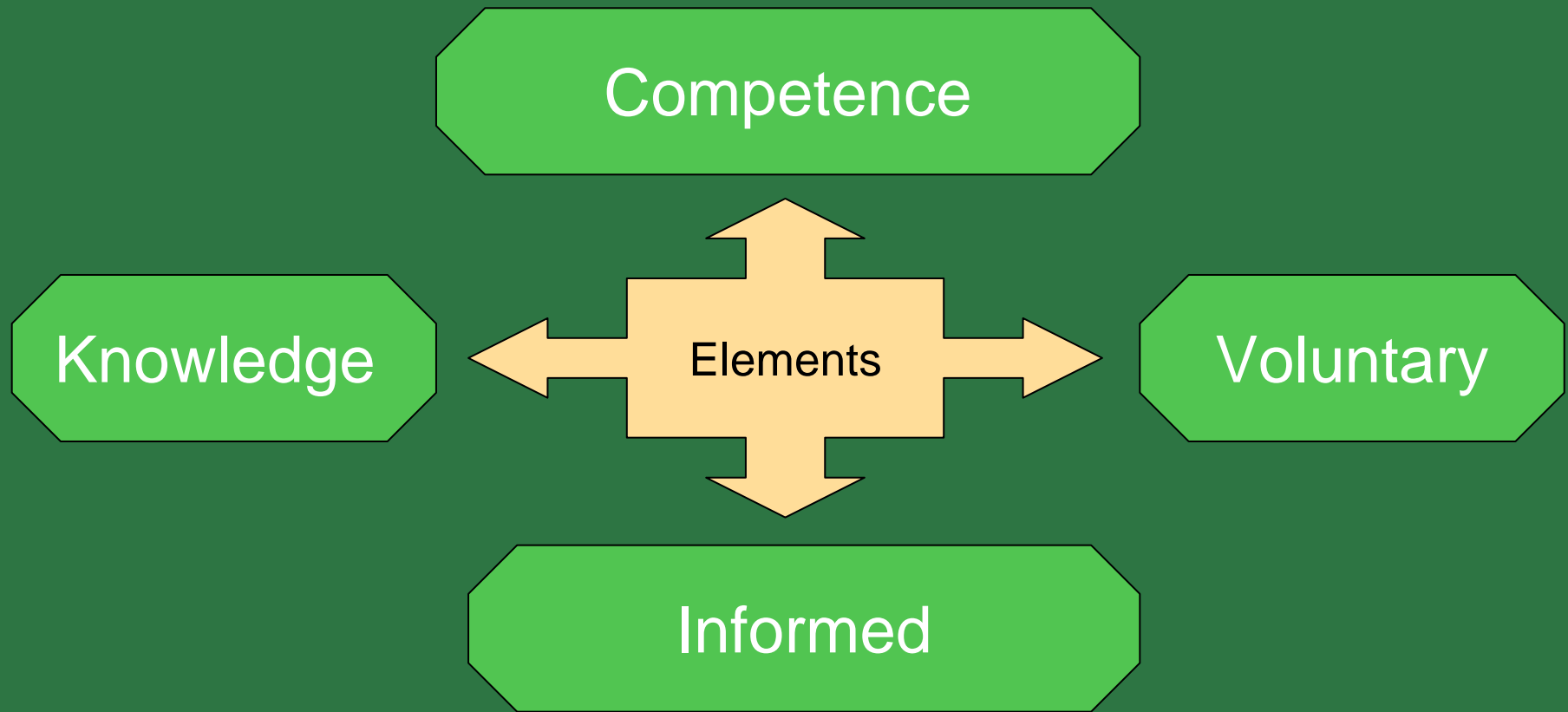


Components of Informed Consent

- 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

Special guidelines apply to children!

- Informed consent means parental approval.

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 confidentially 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.



www.gmiglobal.com/youth
Integrated Software
Global Panels
Service Bureau

Deception



Disguising
non-research
activities

Camouflaging
true research
objectives

Debriefing



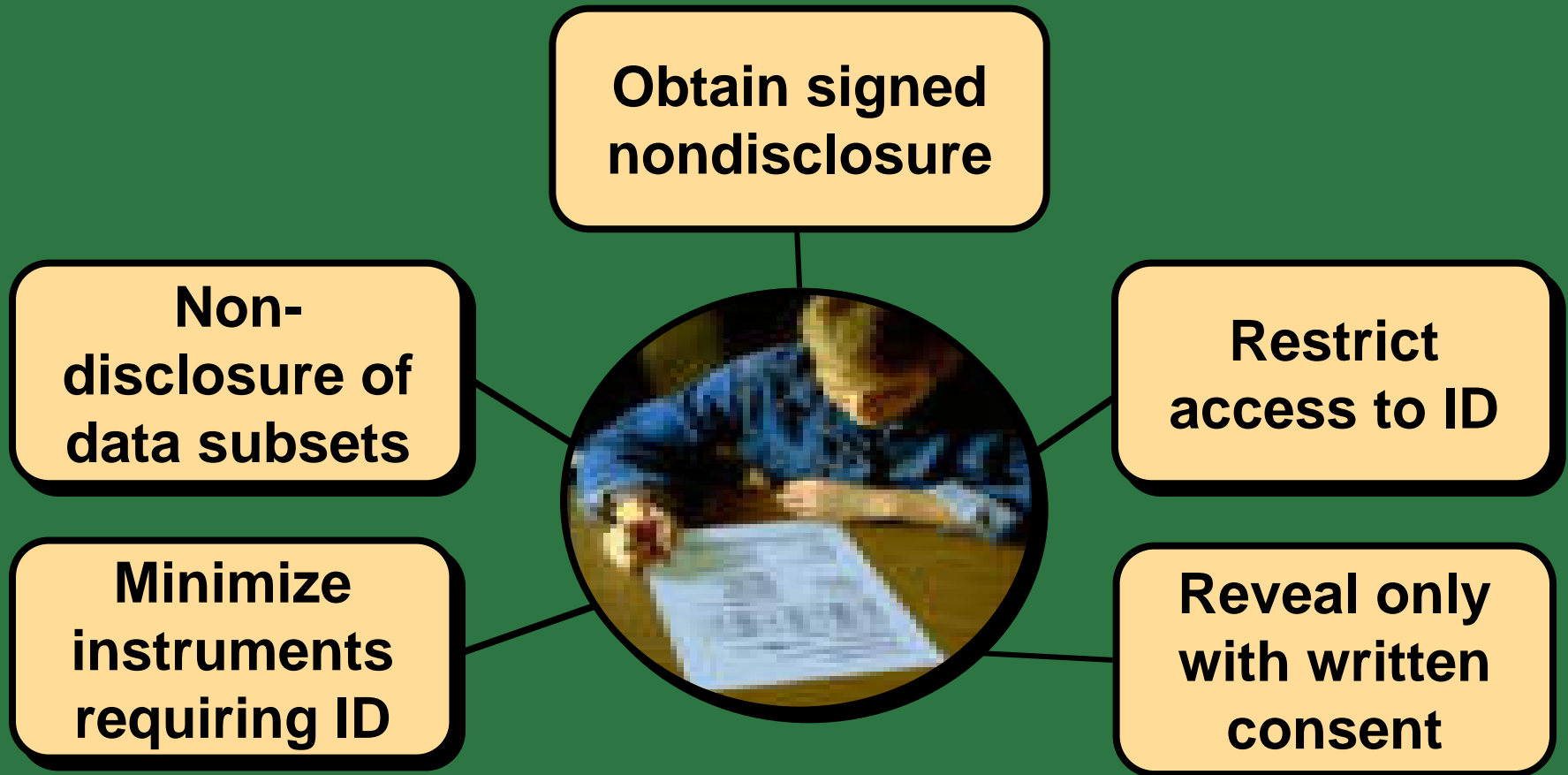
Explain any deception

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



The diagram illustrates the six principles of the U.S. Safe Harbor Agreement. It features a central arrangement of six yellow, rounded rectangular boxes with black outlines, each containing a principle. The boxes are interconnected by a network of yellow, jagged, star-like lines. The entire graphic is set against a solid dark green background. In the top-left corner of the slide, there is a small, vertical rectangular inset image showing a natural scene with trees and a body of water.

Notice

Choice

Access

Security

Onward
Transfer

Data Integrity

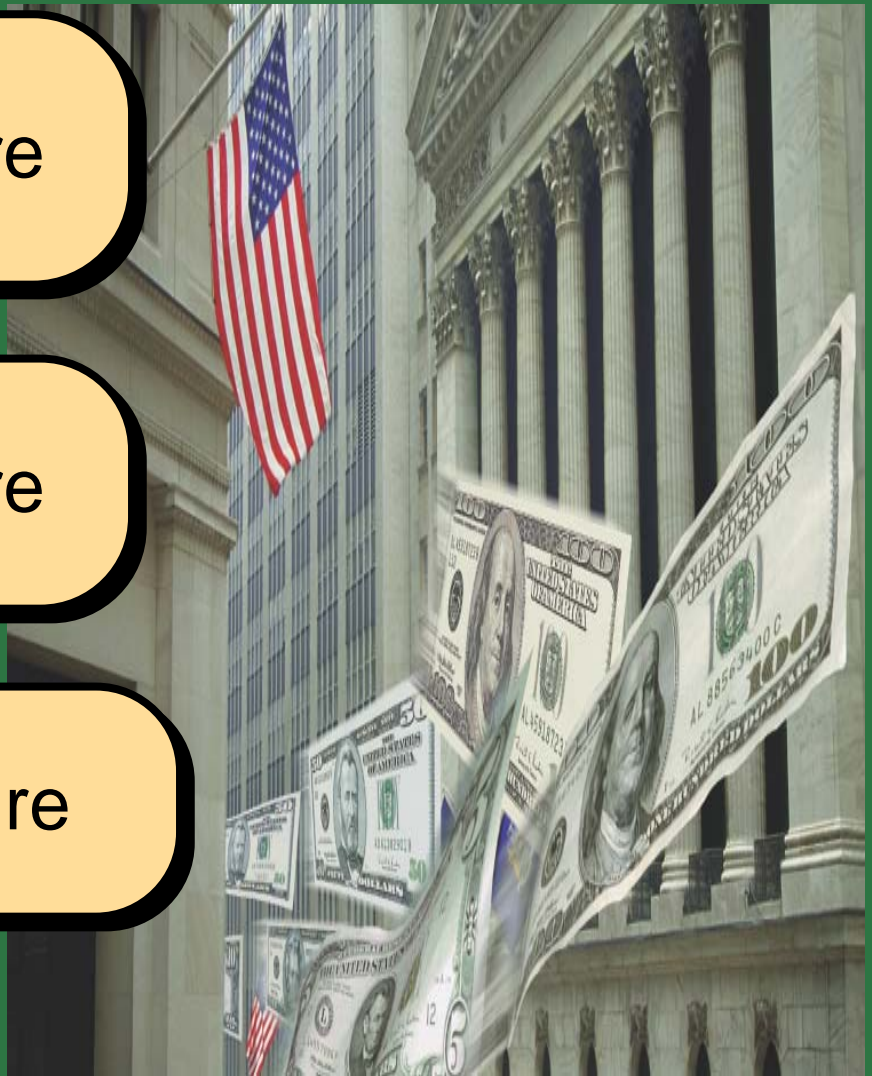
Enforcement

Confidentiality

Sponsor Nondisclosure

Purpose Nondisclosure

Findings Nondisclosure



What To Do If Coerced?

Educate
on
purpose

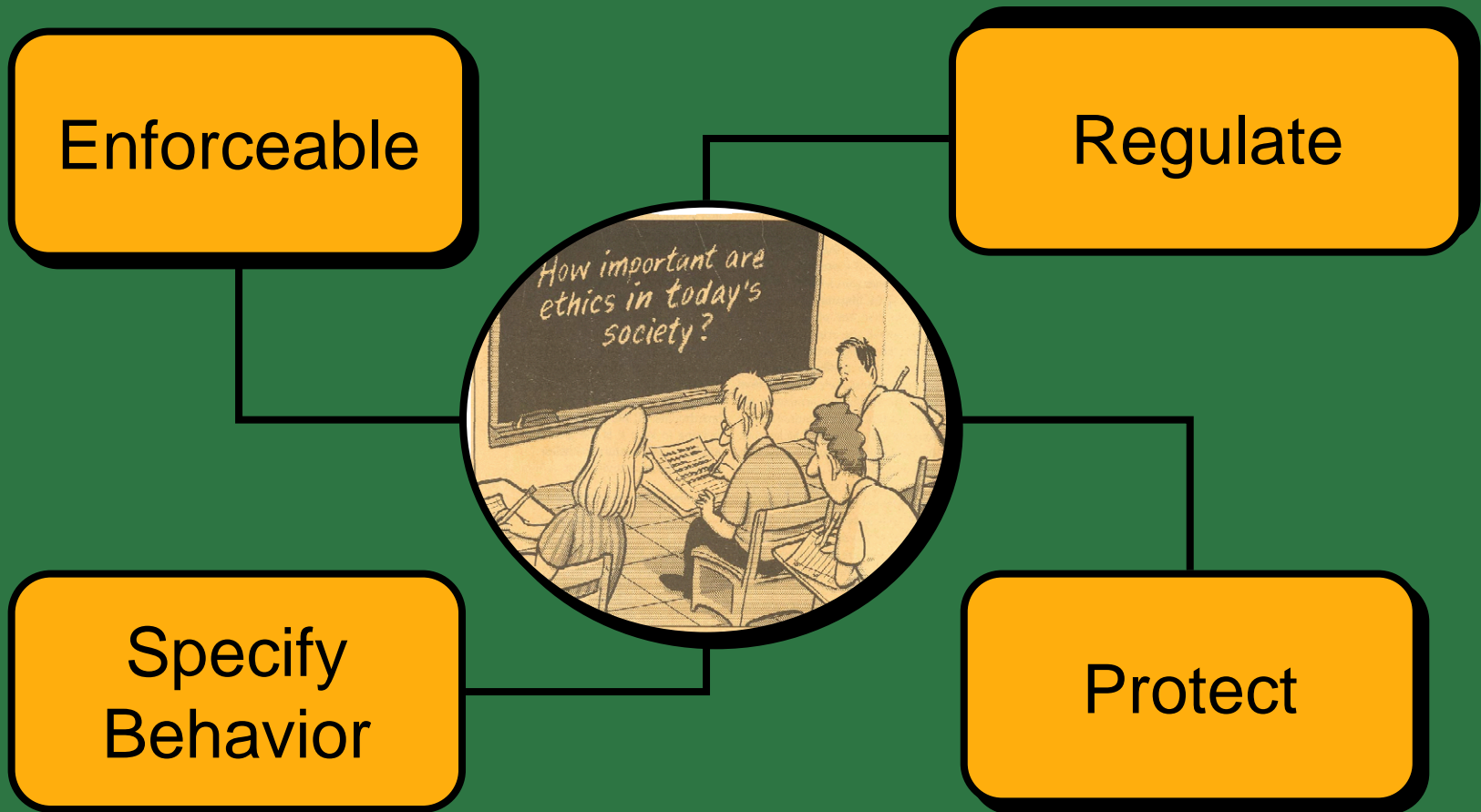
Explain
problems


Emphasize
fact-finding
role

Terminate
relationship



Effective Codes of Ethics





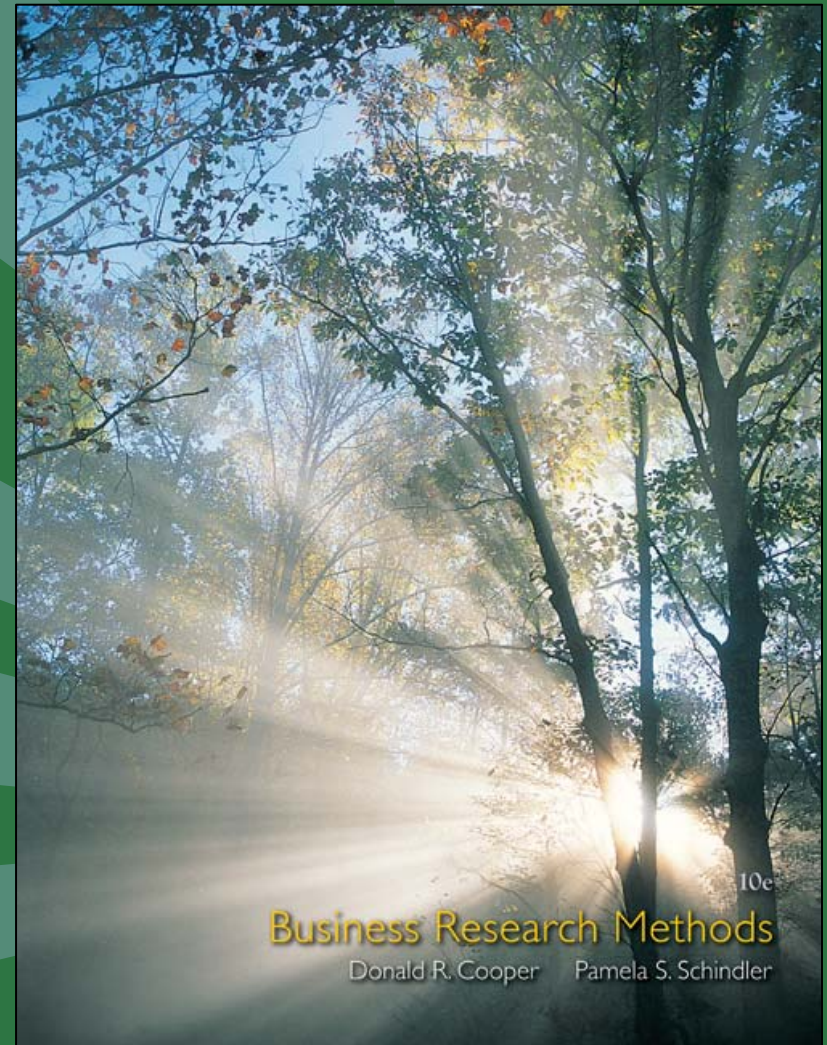
Key Terms


- 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.

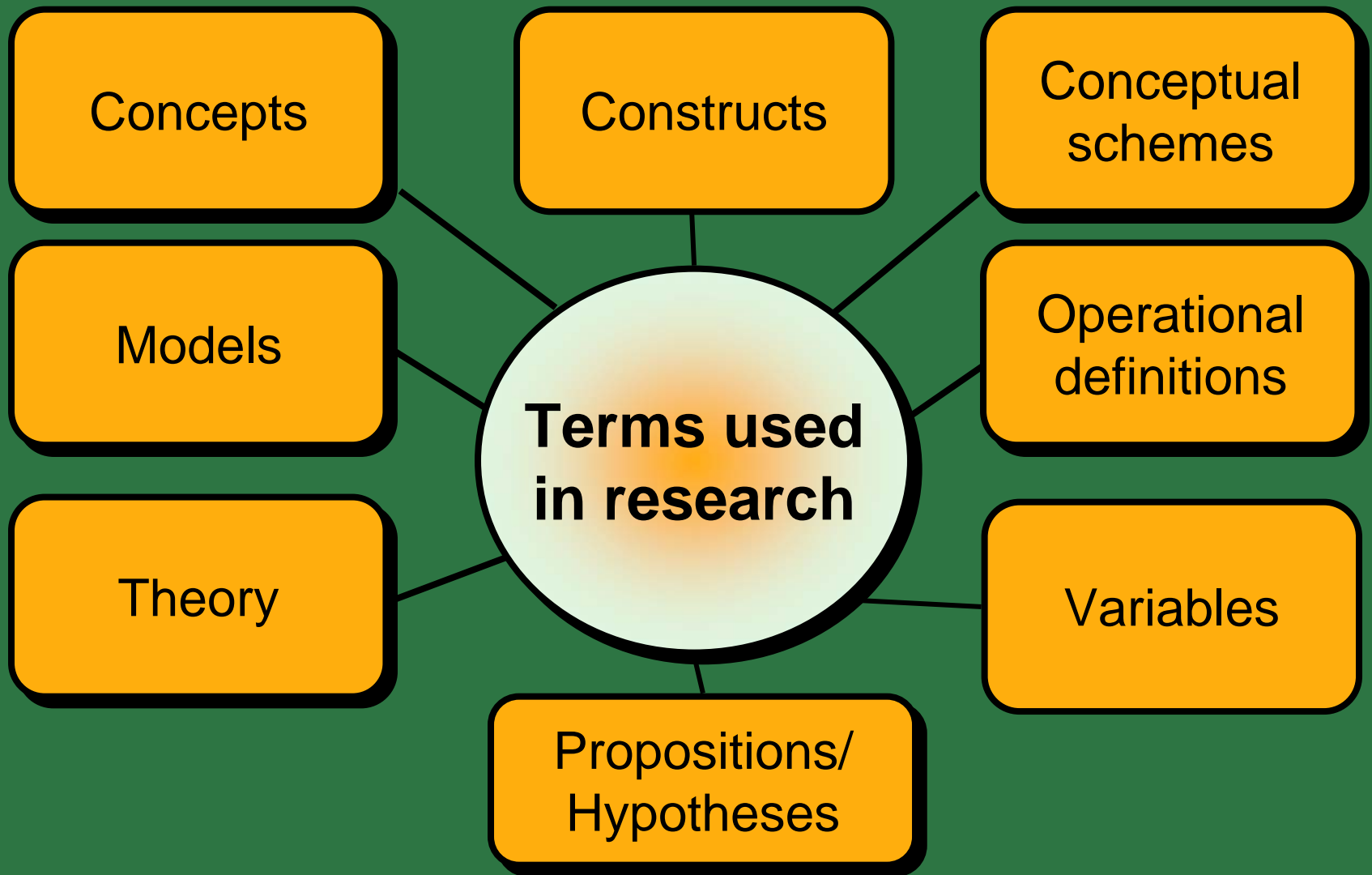


Research and Intuition

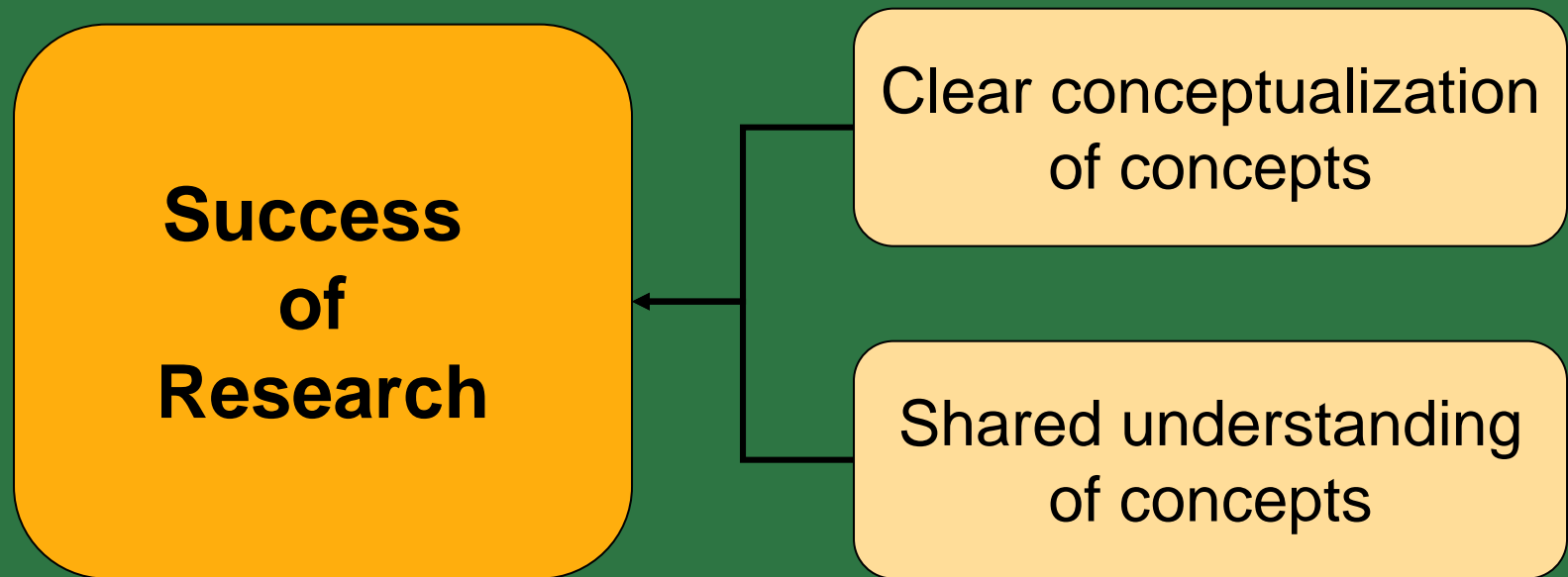
“If we ignore supernatural inspiration, intuition is based on two things: experience and intelligence. The more experience I have with you, the more likely I am to encounter repetition of activities and situations that help me learn about you. The smarter I am, the more I can abstract from those experiences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

Jeffrey Bradshaw, creator of the software that searches databases

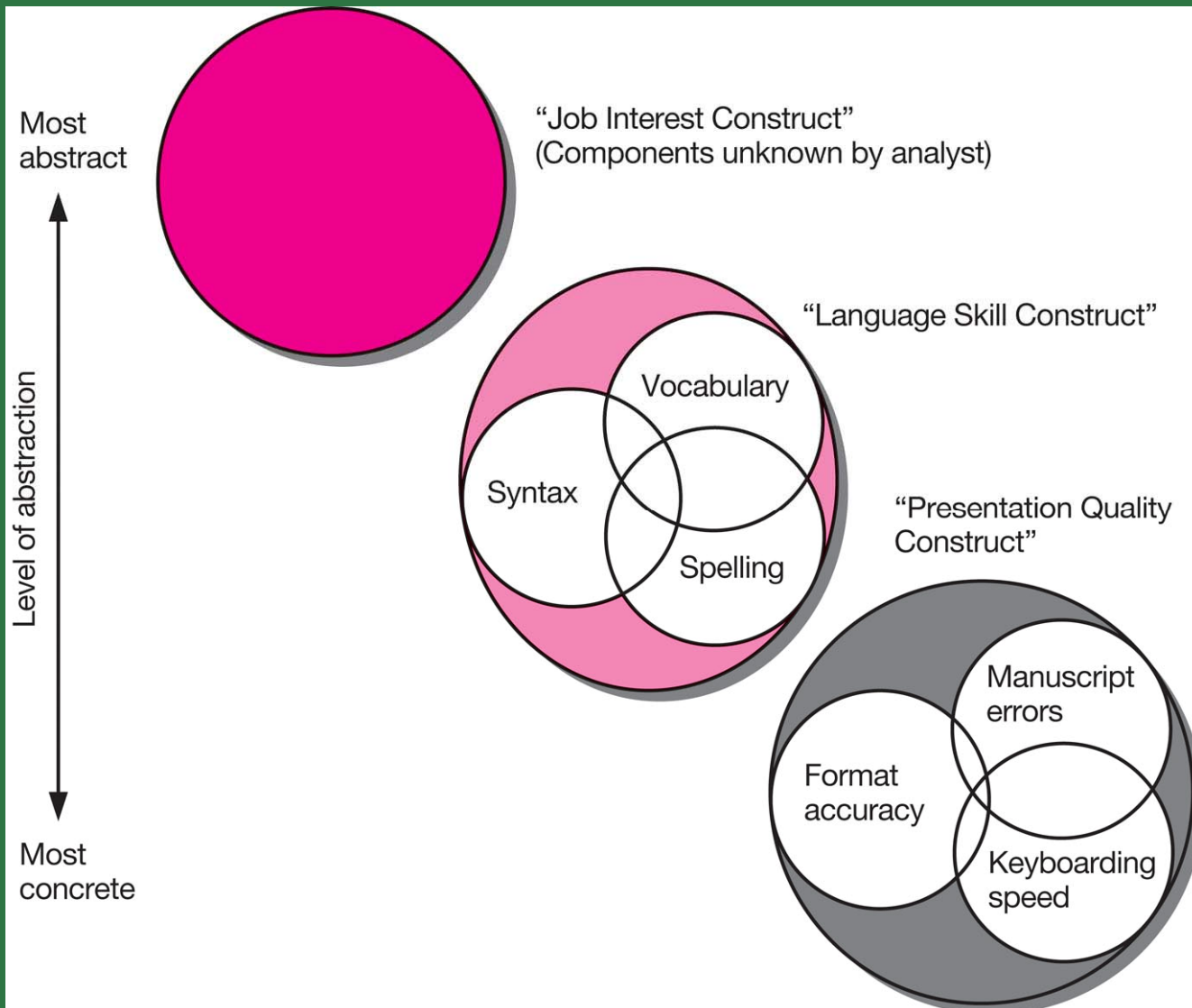
Language of Research




Language of Research



Job Redesign Constructs and Concepts



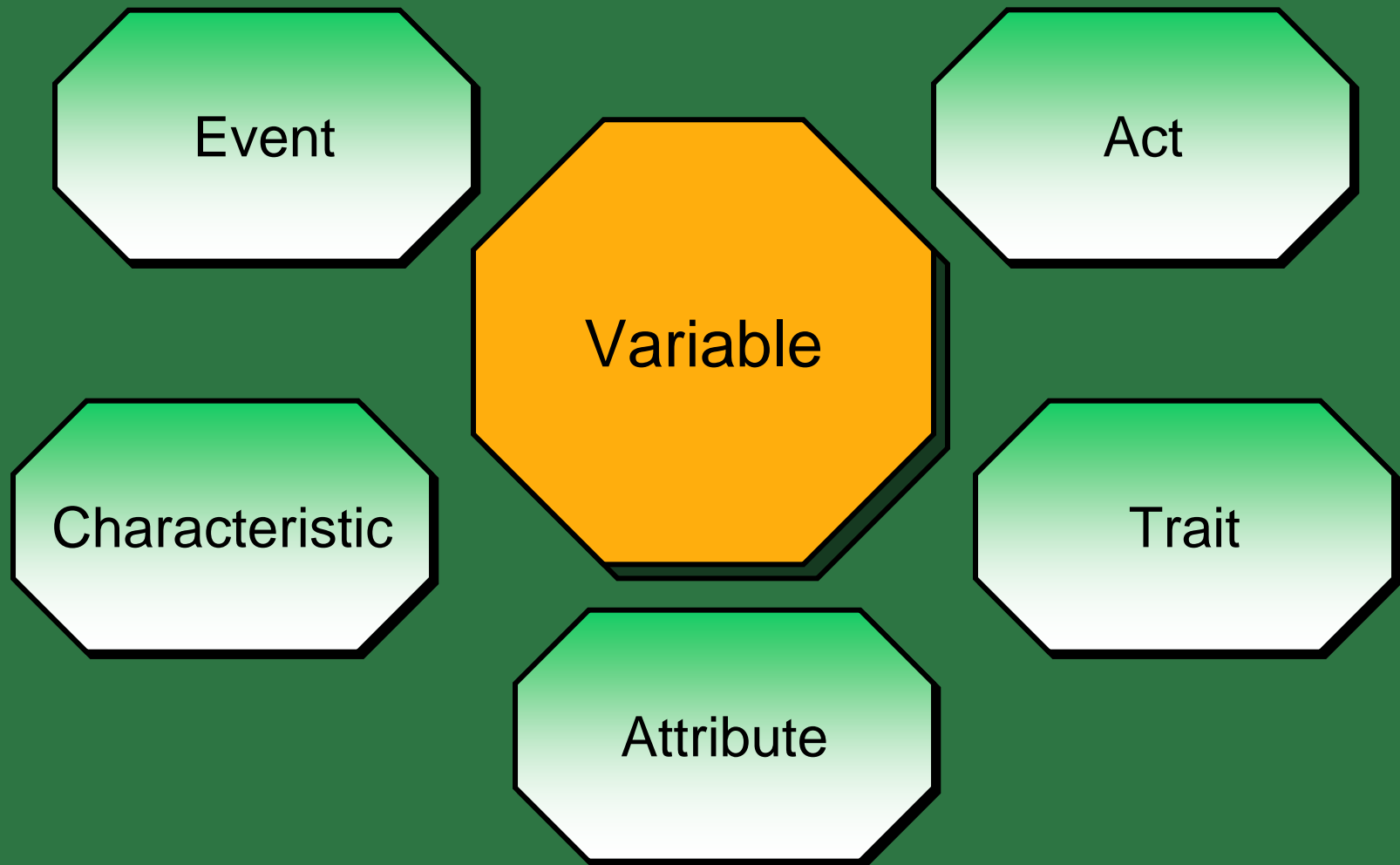


Operational Definitions

**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

Dichotomous

Male/Female
Employed/ Unemployed

Discrete

Ethnic background
Educational level
Religious affiliation

Continuous

Income
Temperature
Age



Independent and Dependent Variable Synonyms

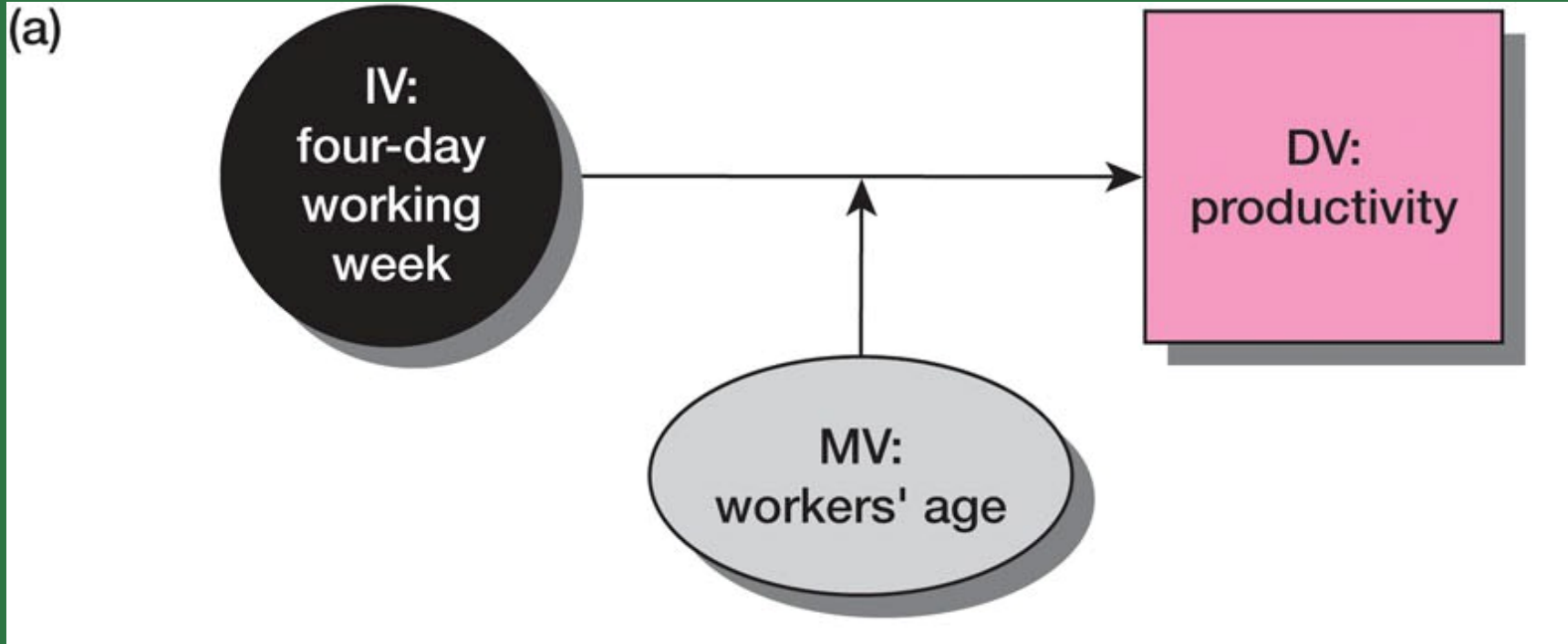
Independent Variable (IV)

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

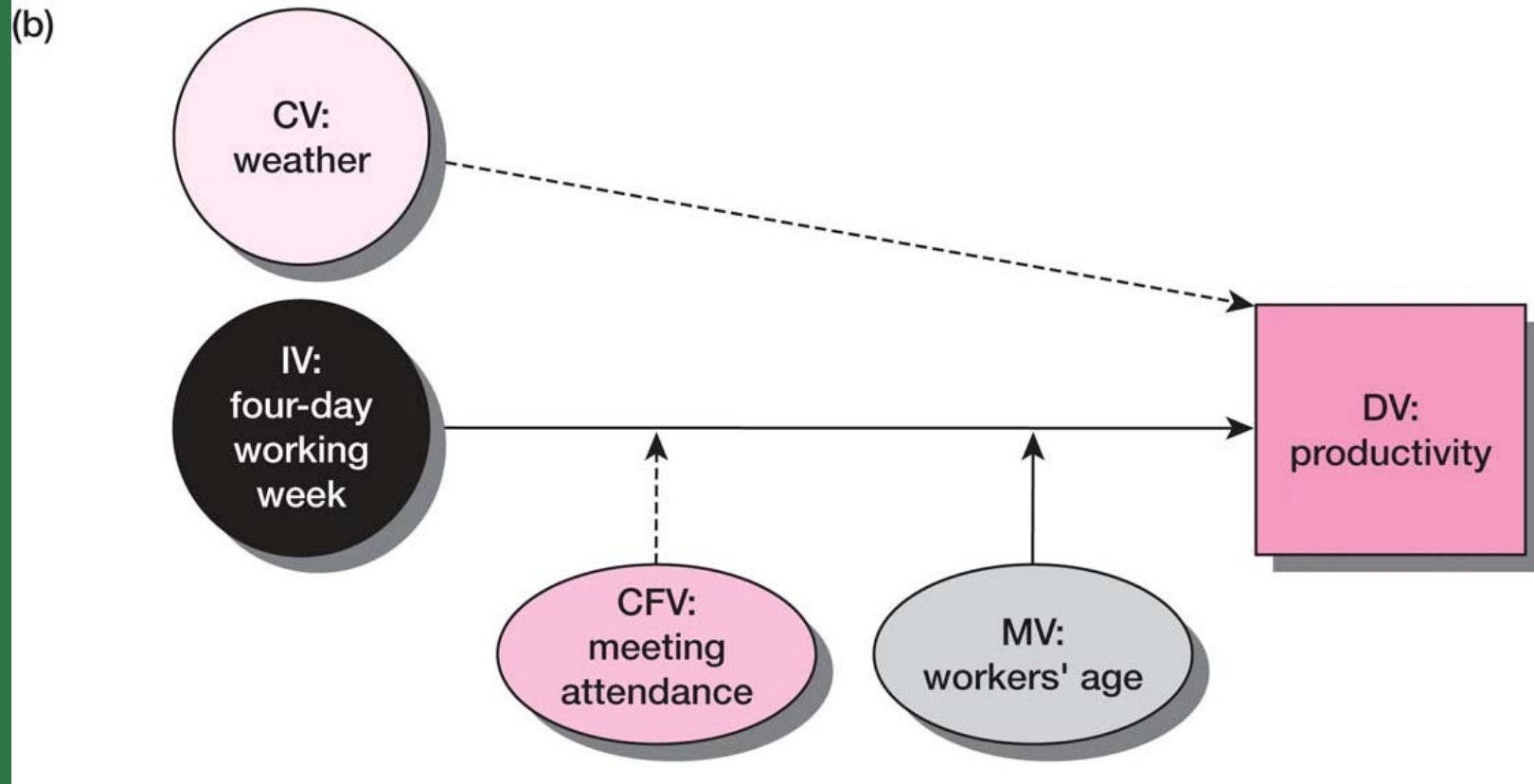
Dependent Variable (DV)

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

Relationships Among Variable Types

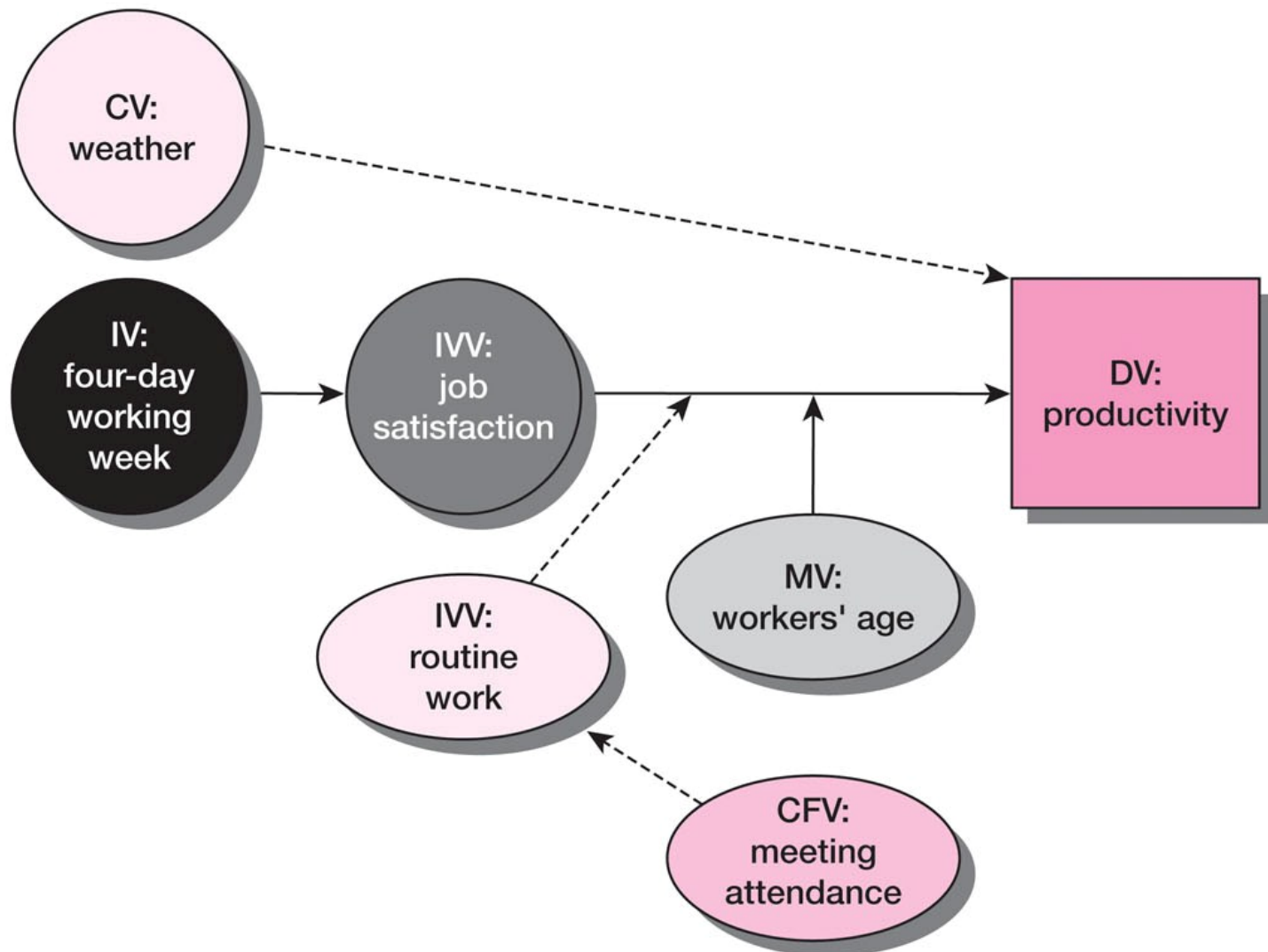



Relationships Among Variable Types



Relationships Among Variable Types

(c)






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

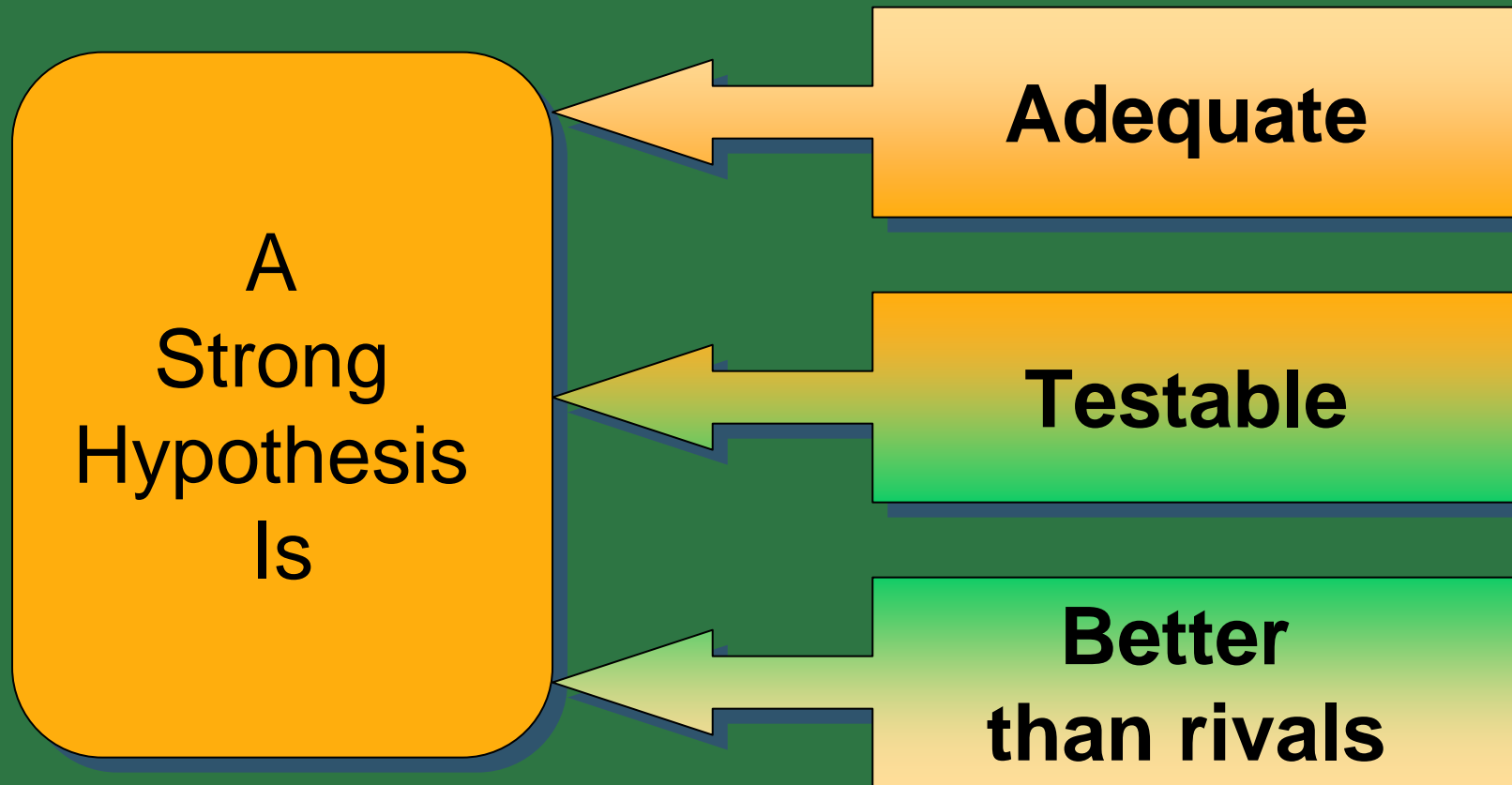
Guide the direction of the study

Identify relevant facts

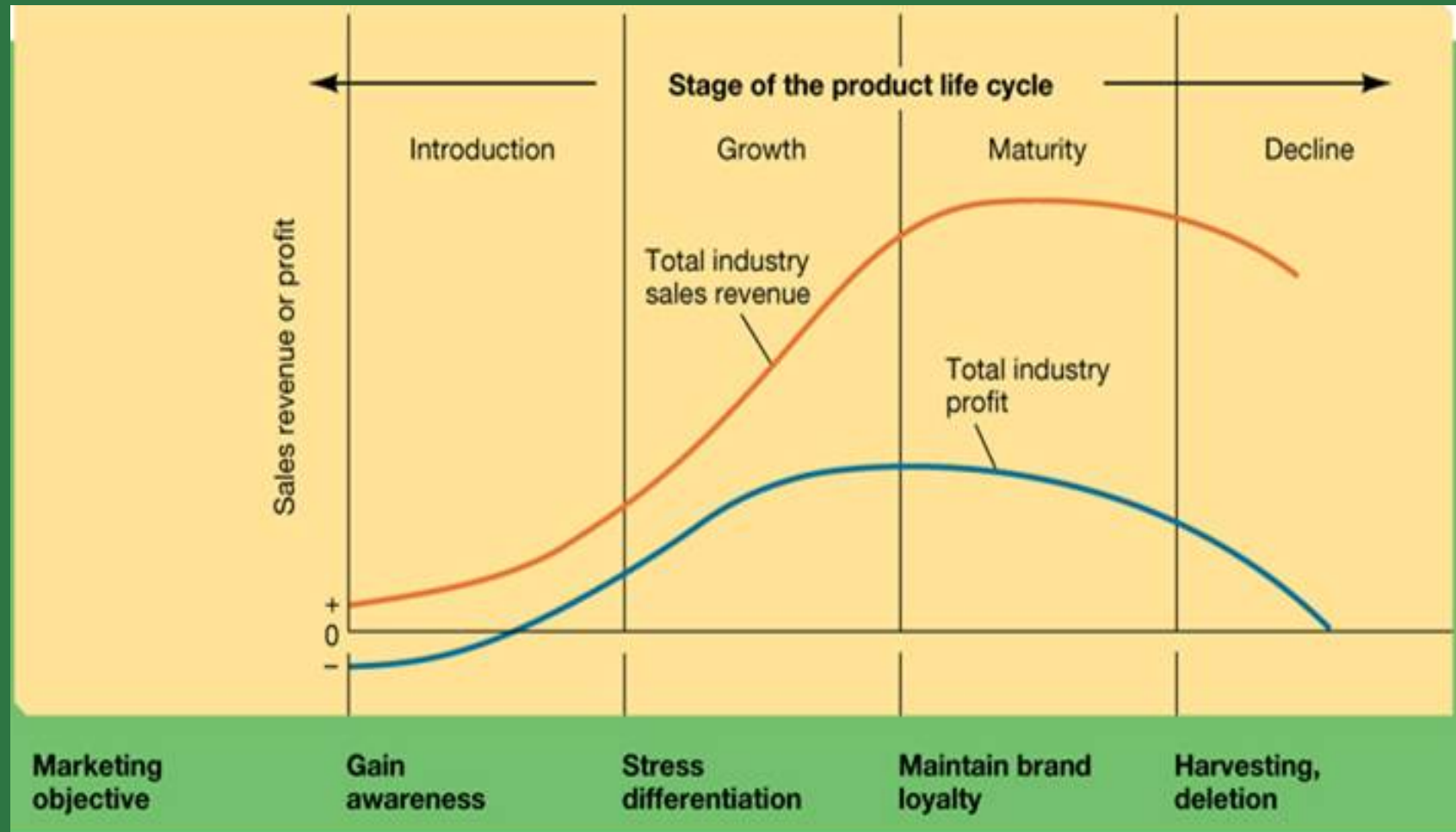
Suggest most appropriate research design

Provide framework for organizing resulting conclusions

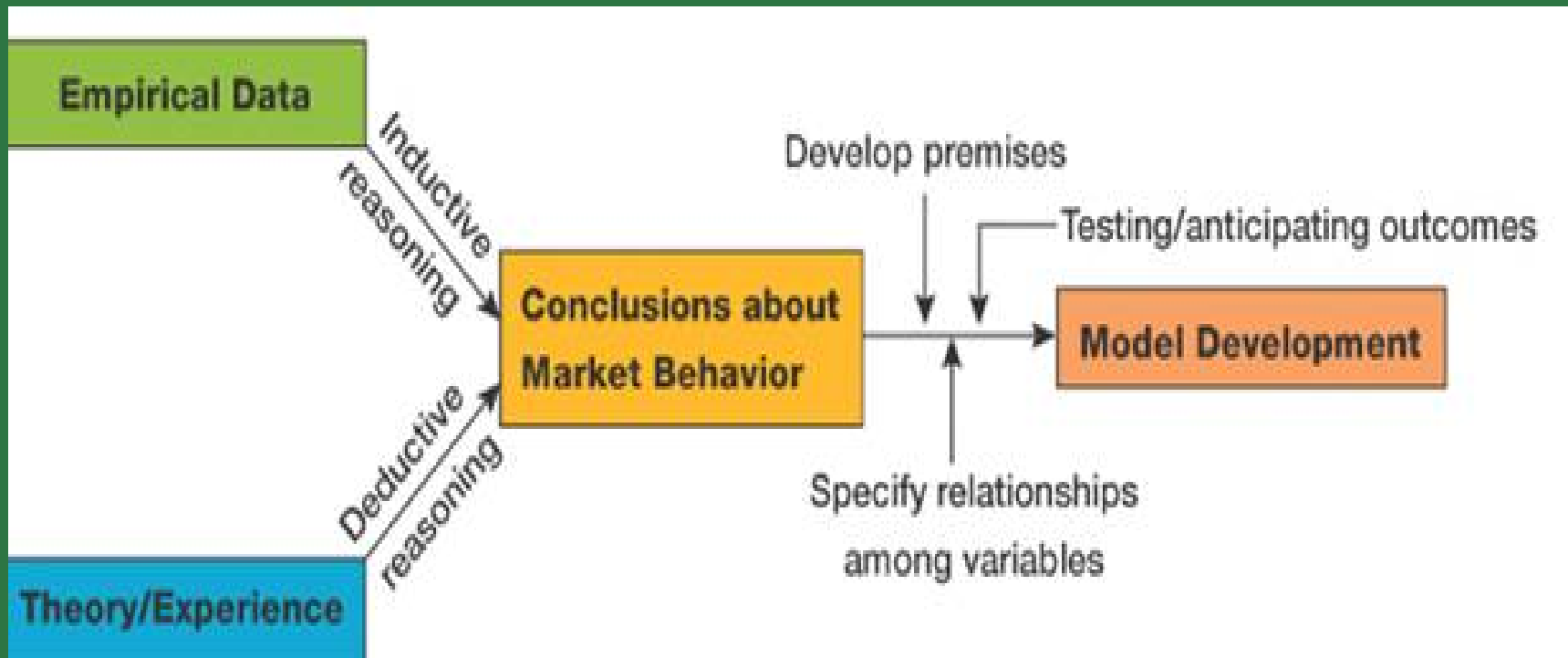
Characteristics of Strong Hypotheses



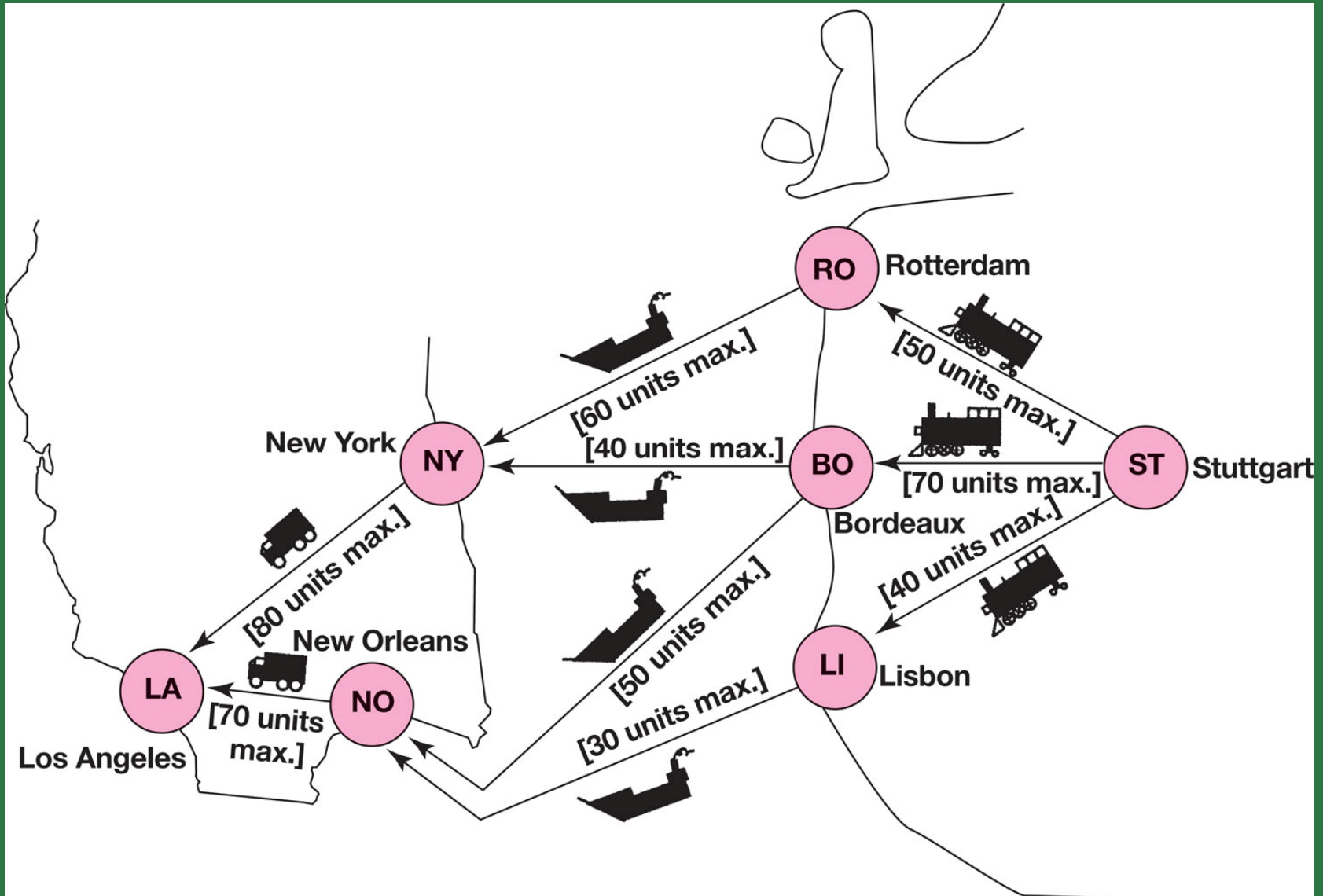
Theory within Research



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?

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.*"

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.

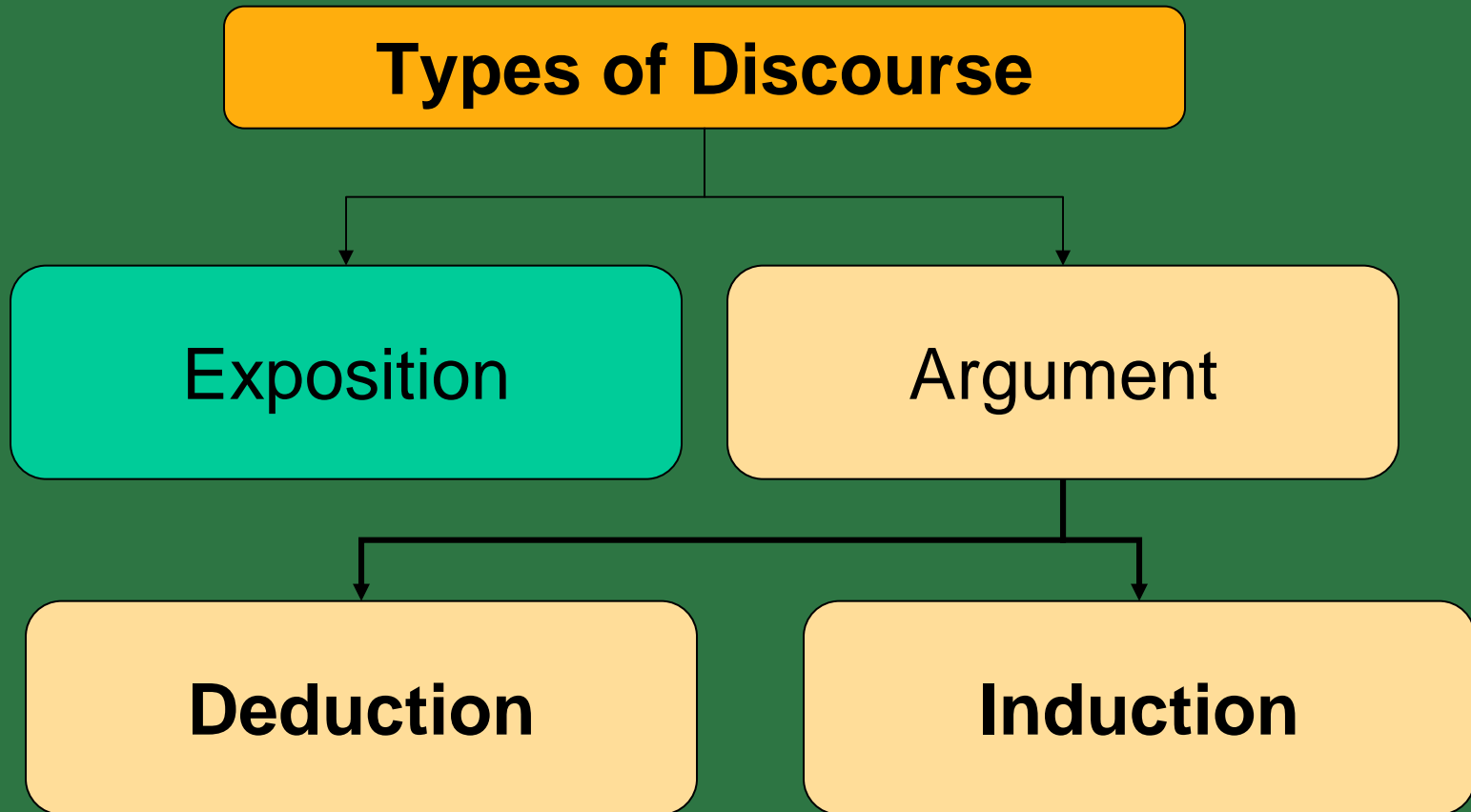
If you're curious to see our global market intelligence in action for yourself, email us at curious@synovate.com.

After all, history has proven us right.

www.synovate.com



Sound Reasoning



Deductive Reasoning



Inner-city household interviewing is especially difficult and expensive

This survey involves substantial inner-city household interviewing

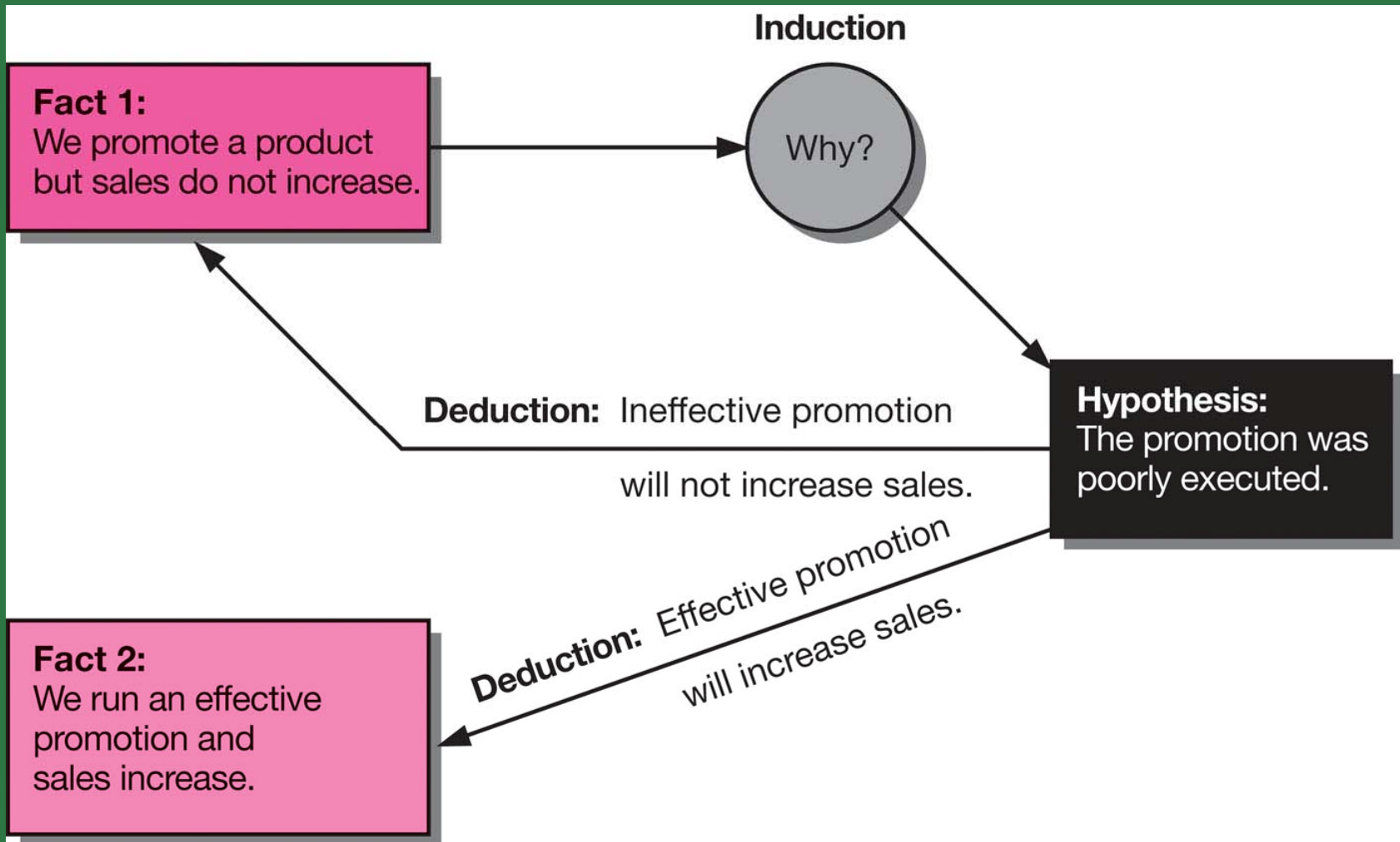
The interviewing in this survey will be especially difficult and expensive



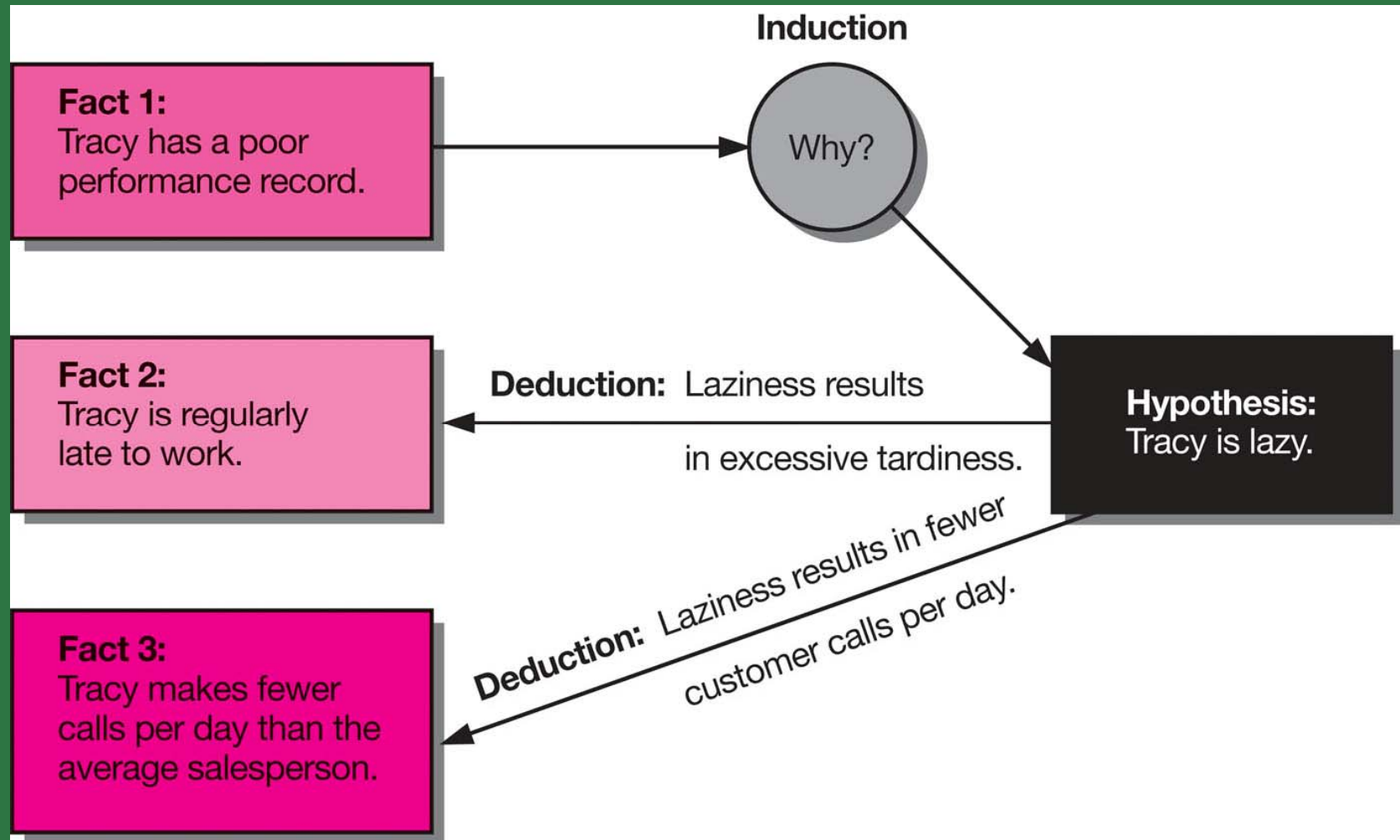
Inductive Reasoning


- 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



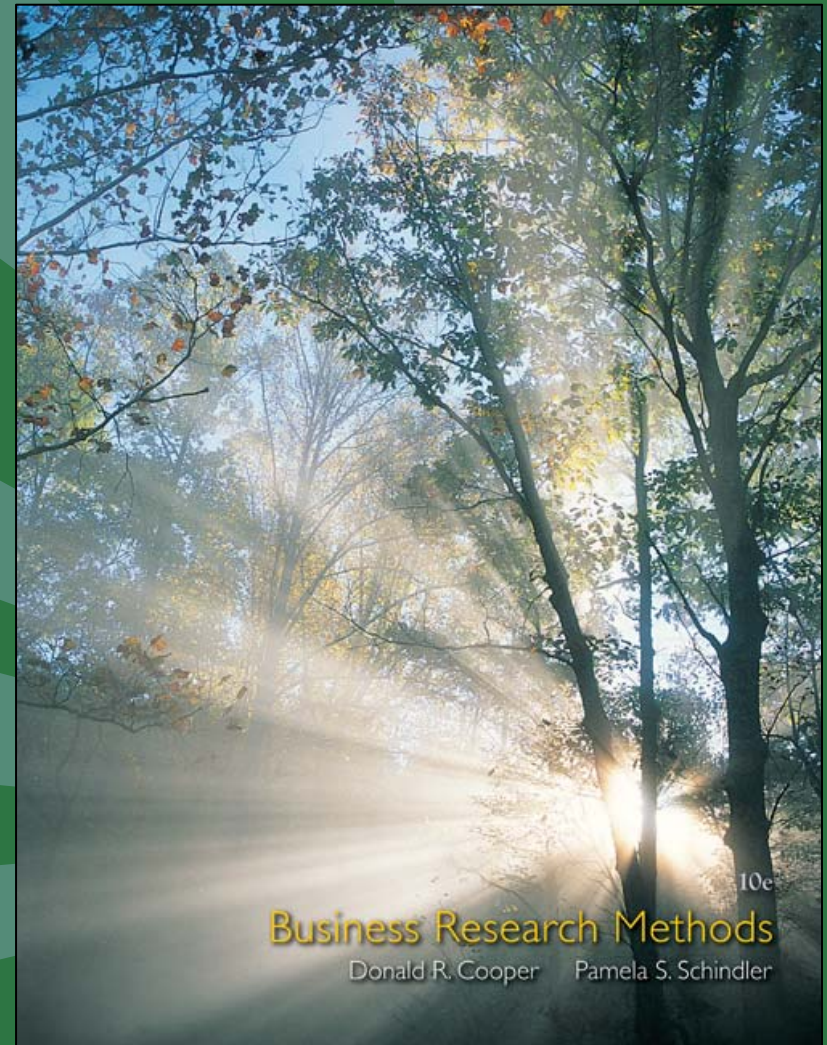



Key Terms

- | | |
|---|---|
| <ul style="list-style-type: none">• Argument• Case• Concept• Conceptual scheme• Construct• Deduction• Empiricism• Exposition• Hypothesis<ul style="list-style-type: none">– Correlational– Descriptive– Explanatory– Relational• Hypothetical construct | <ul style="list-style-type: none">• Induction• Model• Operational definition• Proposition• Sound reasoning• Theory• Variable<ul style="list-style-type: none">– 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

Greenfield Online
Leading the Research Revolution®



Evaluating the Value of Research



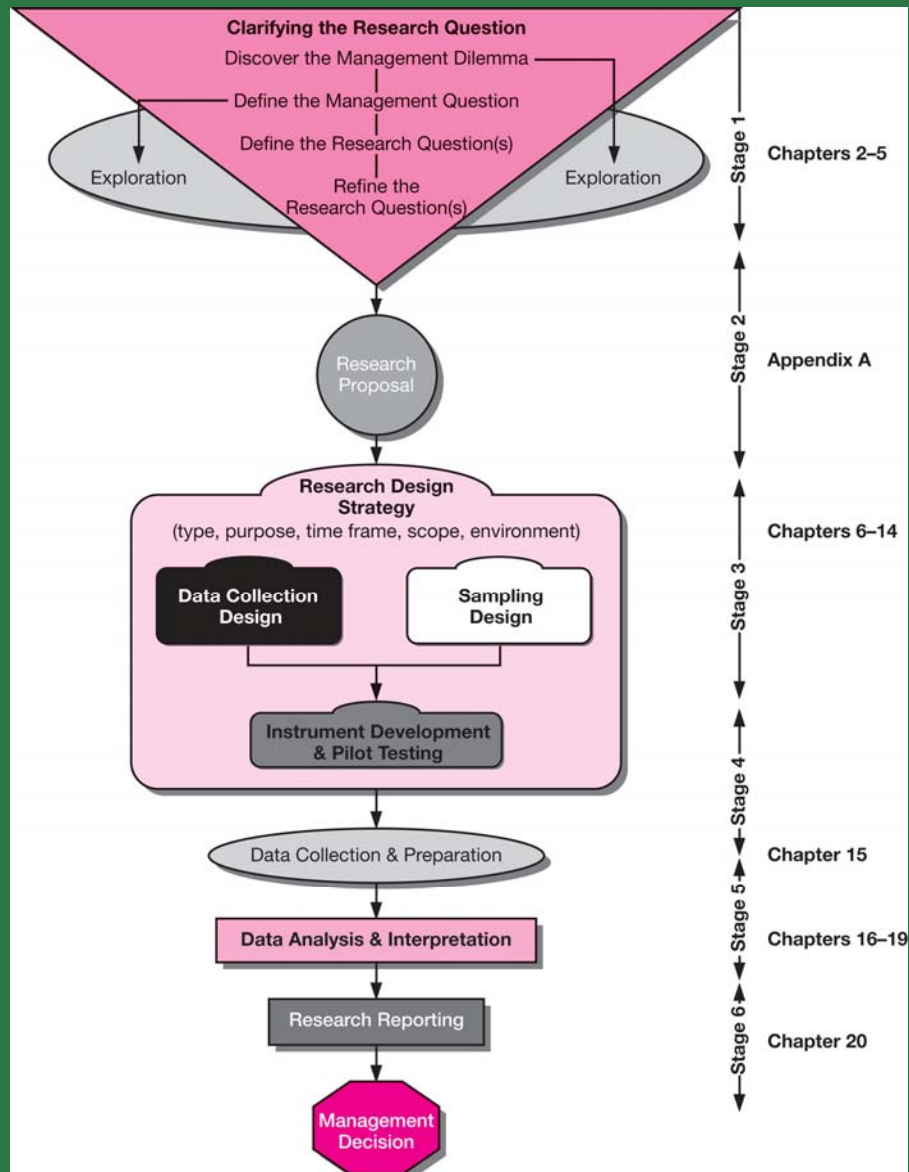
Option Analysis

Decision Theory

Prior or Interim Evaluation

Ex Post Facto Evaluation

The Business Research Process

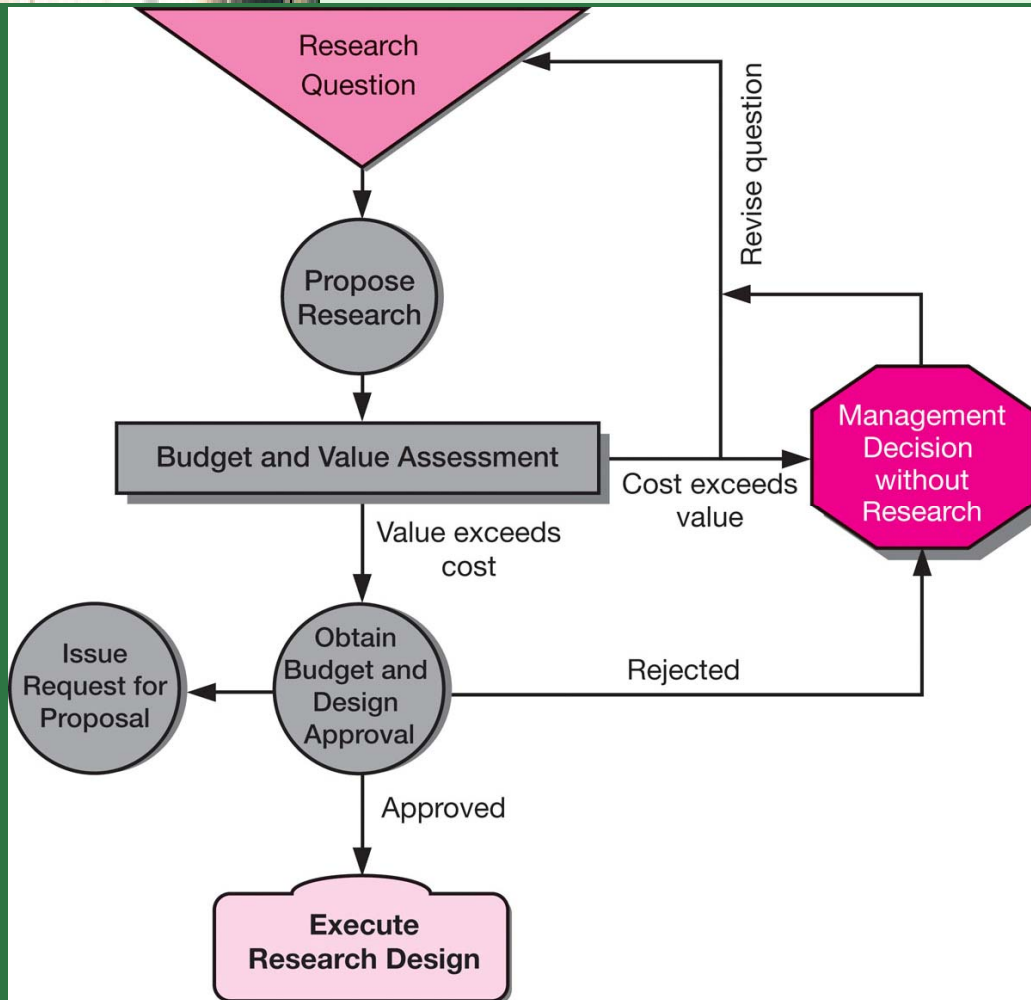


Stage 1: Clarifying the Research Question



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

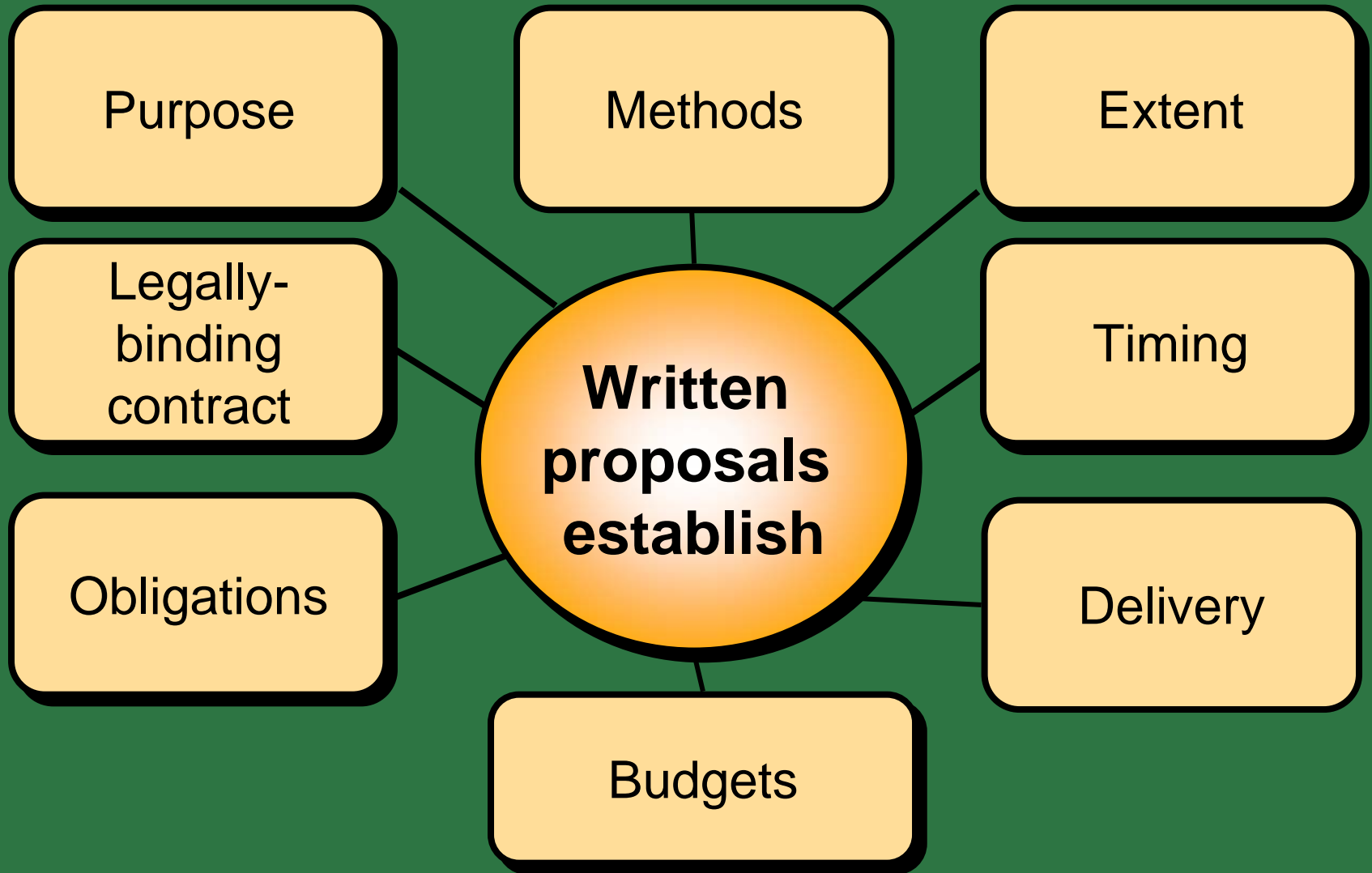
Stage 2: Proposing Research



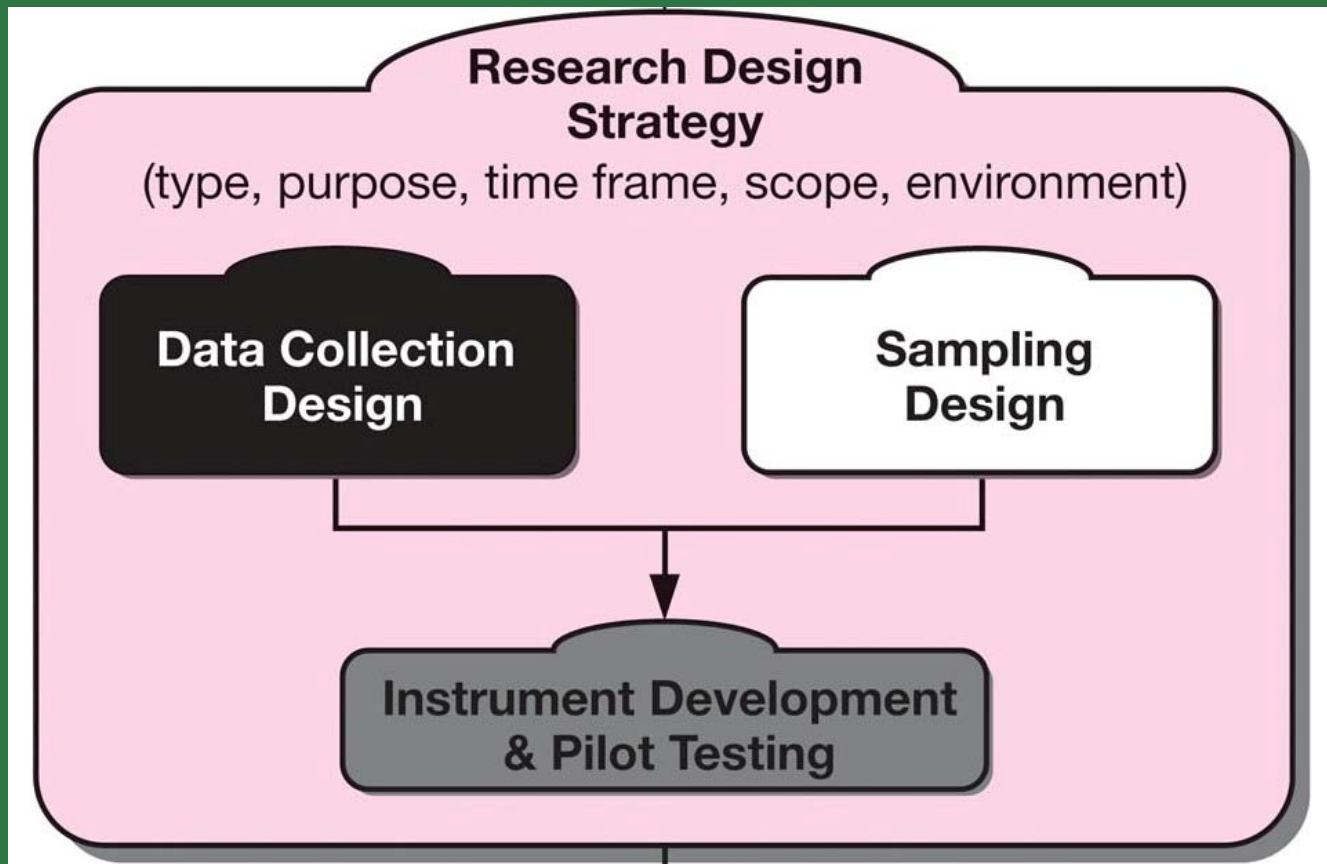
Budget Types

- Rule-of-thumb
- Departmental
- Task

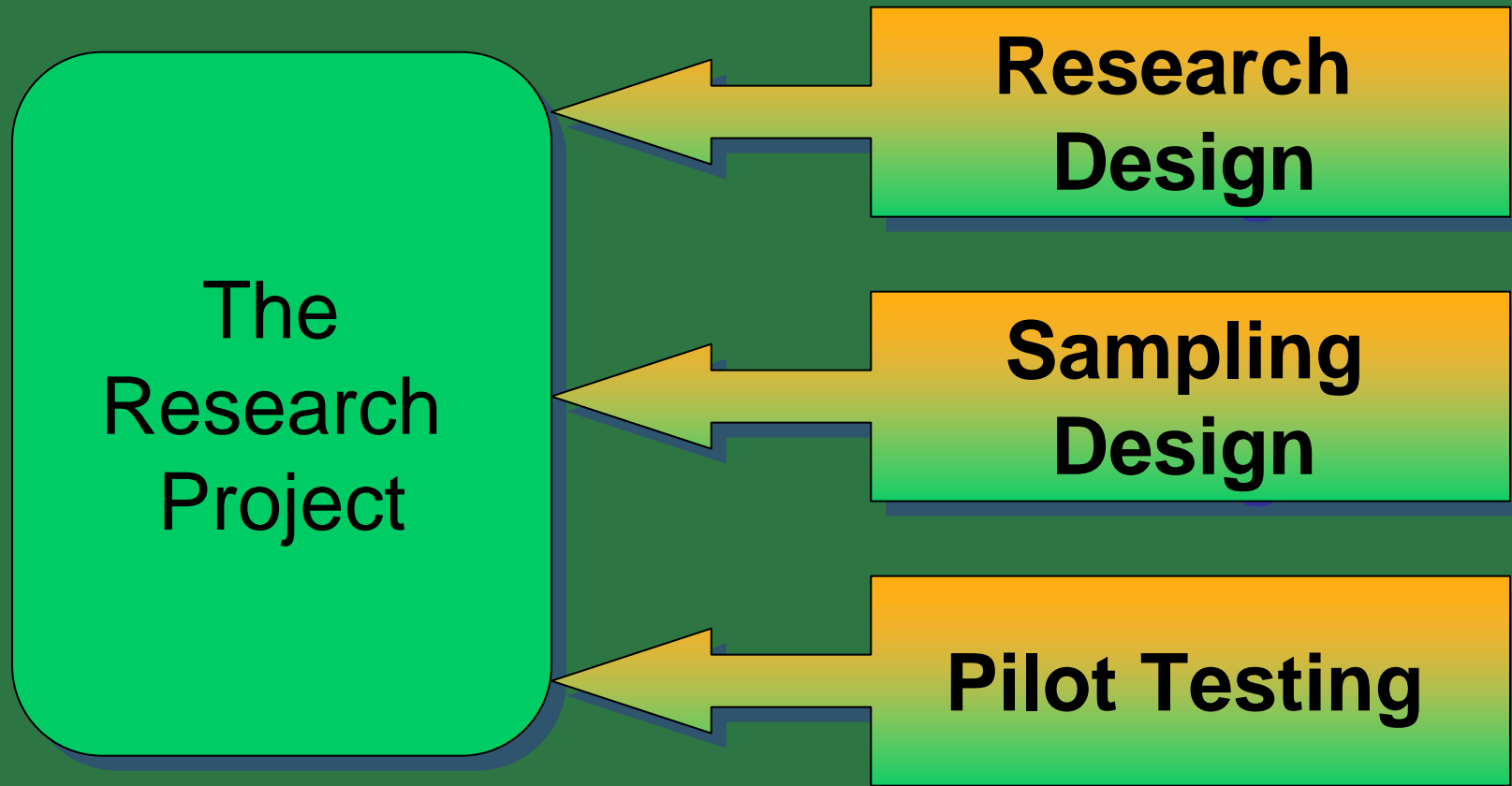
The Research Proposal



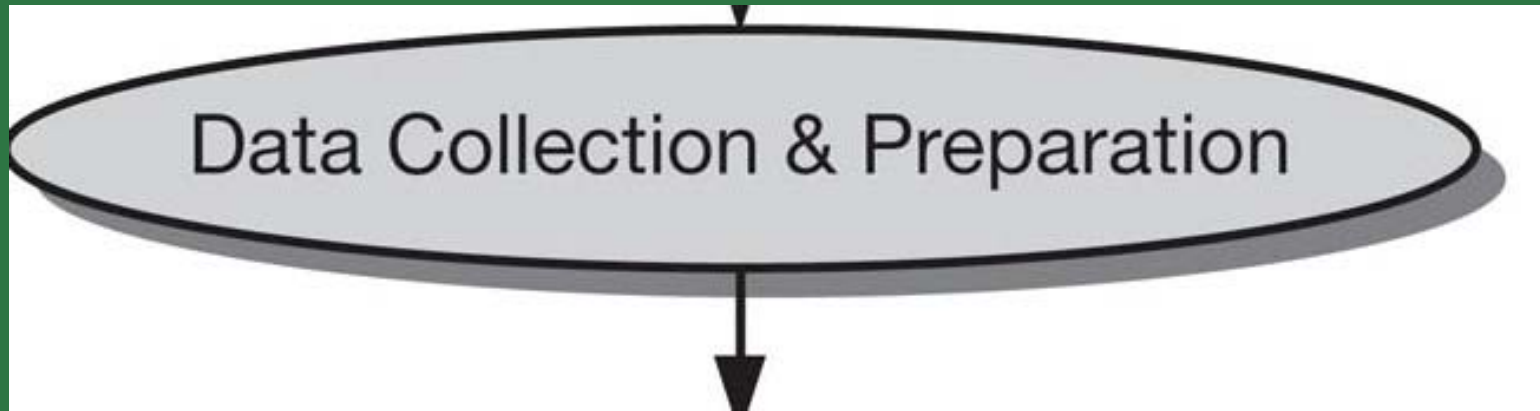
Stage 3: Research Design



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

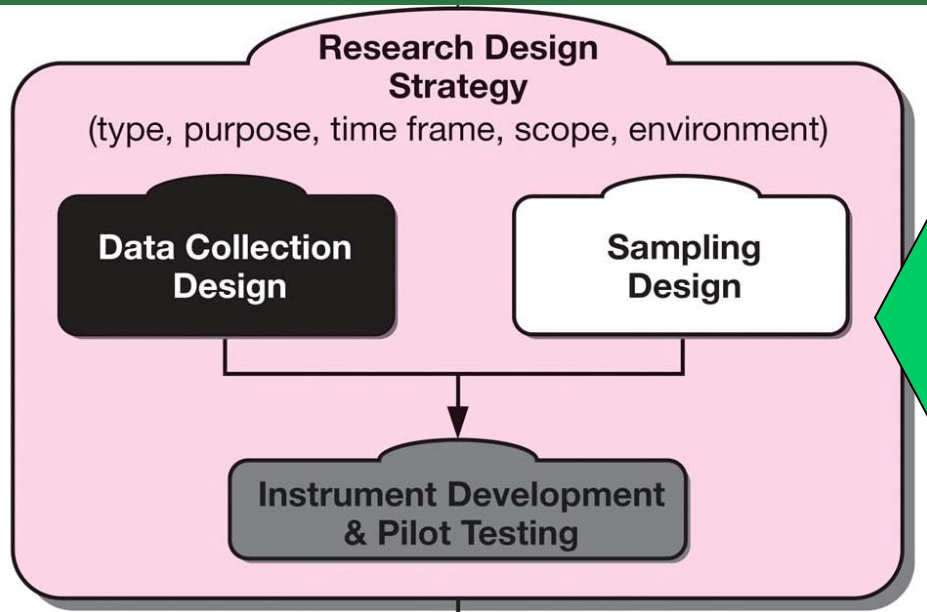
Conclusions

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

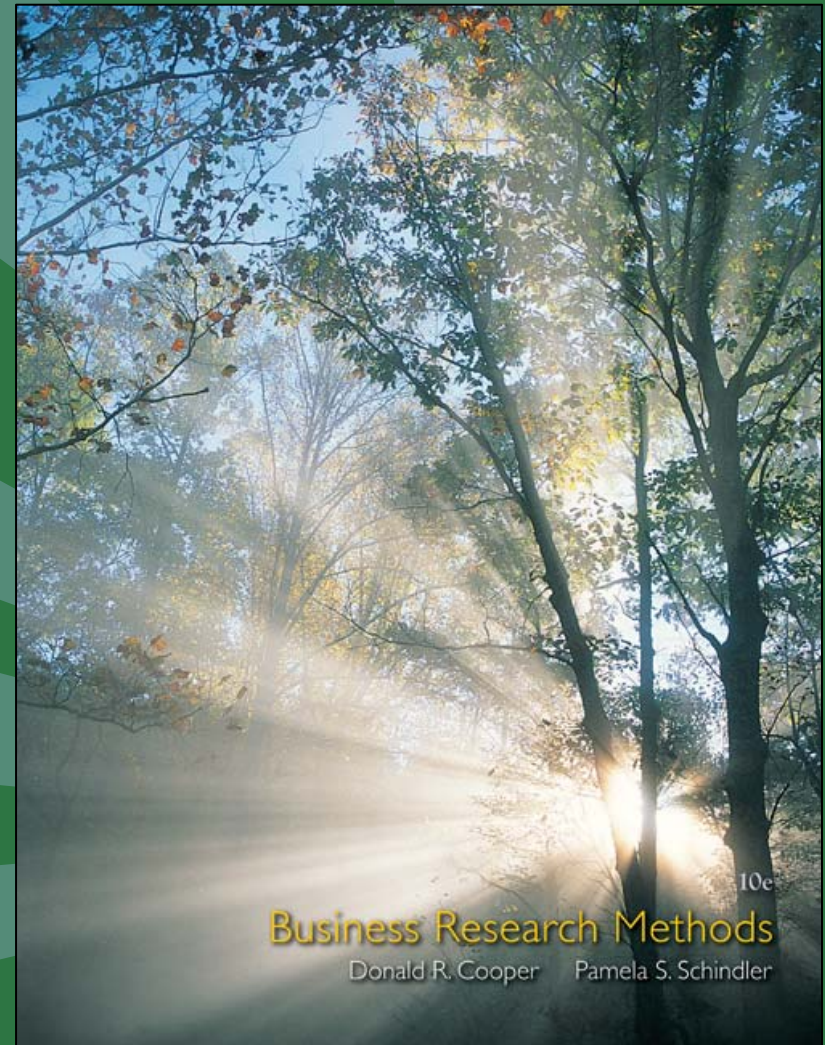



Key Terms

- | | |
|---|--|
| <ul style="list-style-type: none">• Census• Data<ul style="list-style-type: none">–Primary data–Secondary data• Data analysis• Decision rule• exploration• Investigative questions• Management dilemma | <ul style="list-style-type: none">• 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

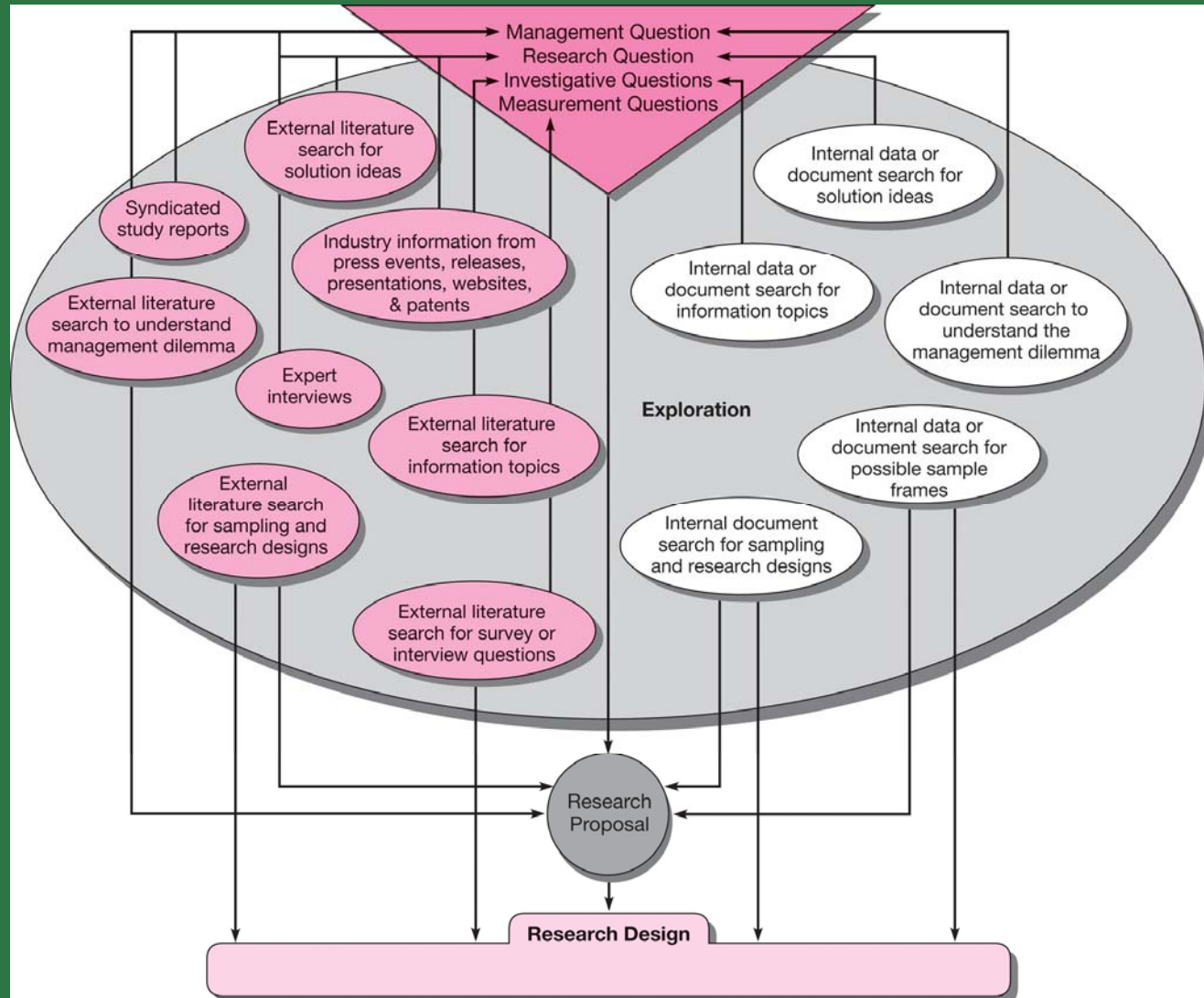
“Executives today are at risk of drowning in an ocean of technology-generated data. One possible response to data overload is to tune out completely, but that only takes the problem to the other extreme. A better response is to make the company’s business model as simple and as transparent as possible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

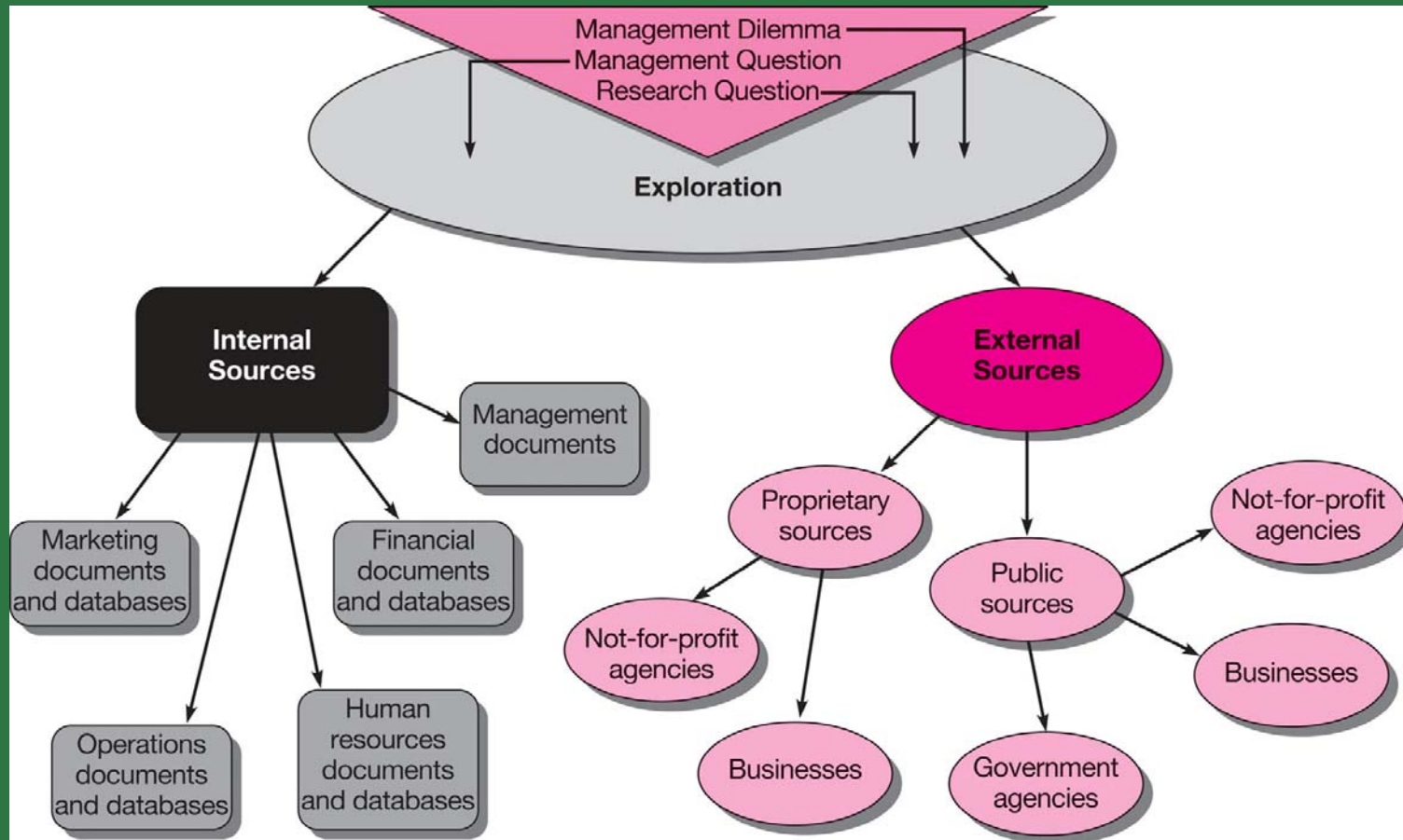
Secondary Sources:

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.



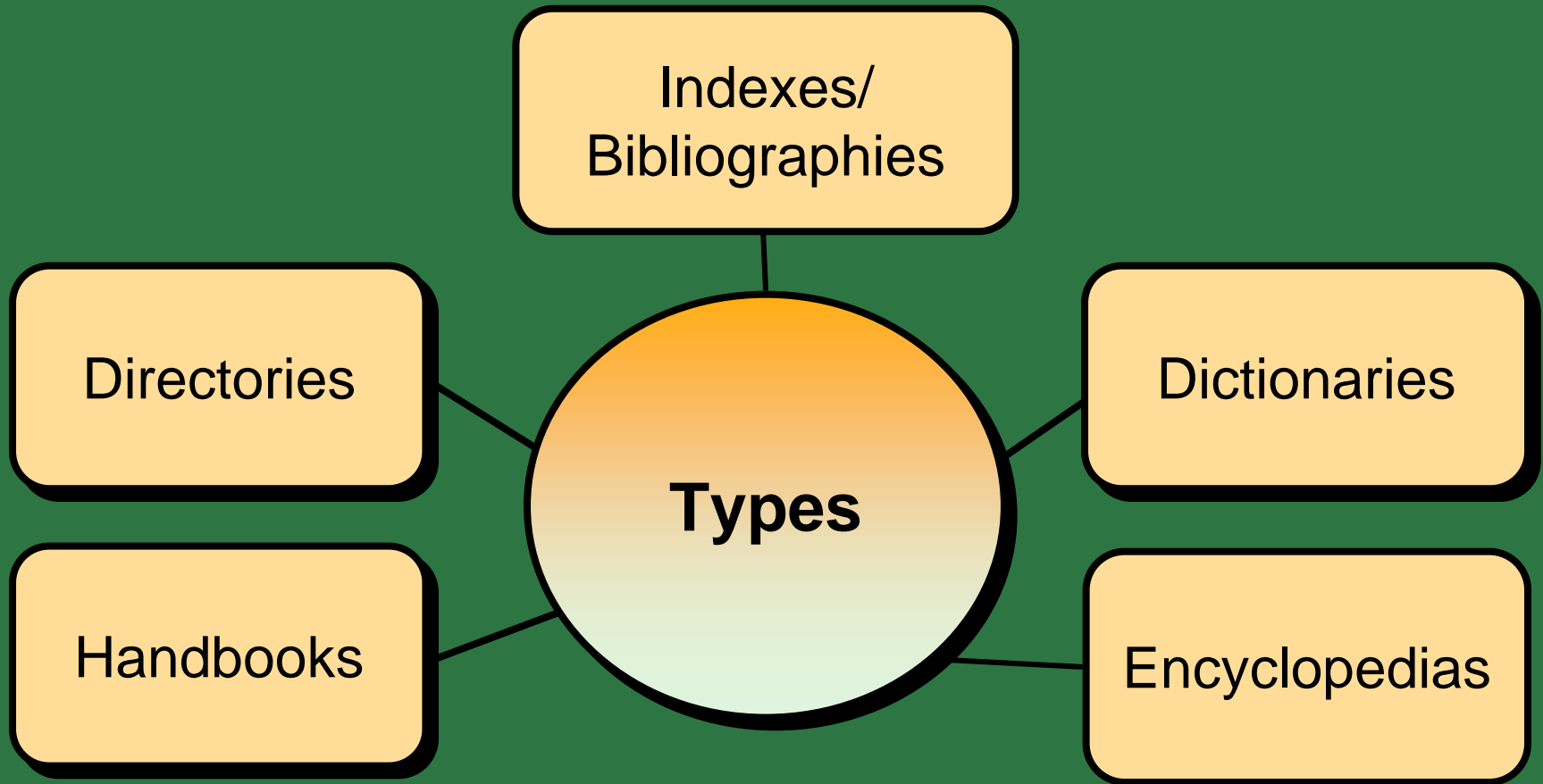
We'll answer your questions directly or get you to the person who can. Recorded information is also available around the clock.

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

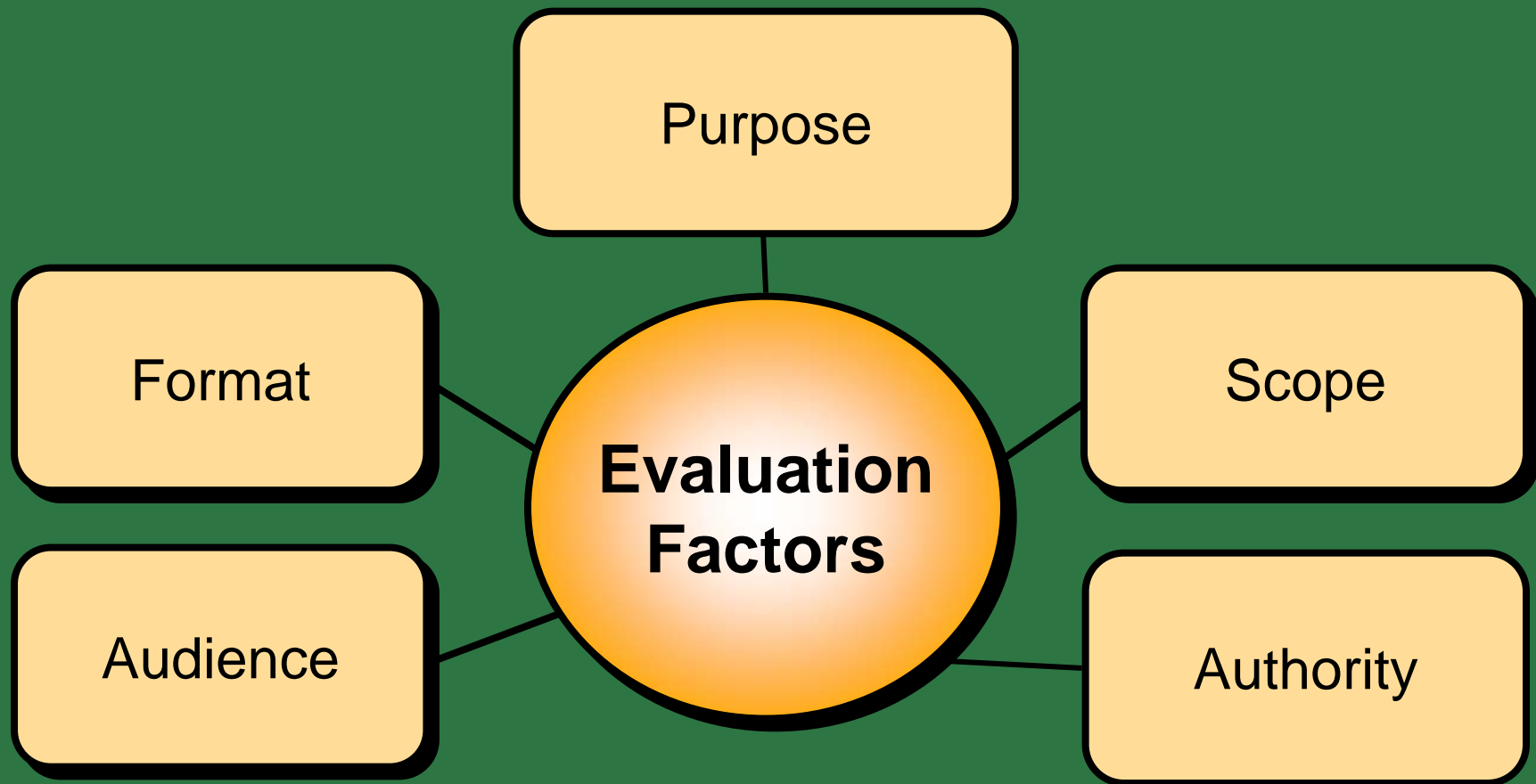
1-800-FED-INFO
(That's 1-800-333-4636)


Monday through Friday 8 a.m. to 8 p.m. Eastern Time
or visit www.pueblo.gsa.gov/call

Information Sources



Evaluating Information Sources

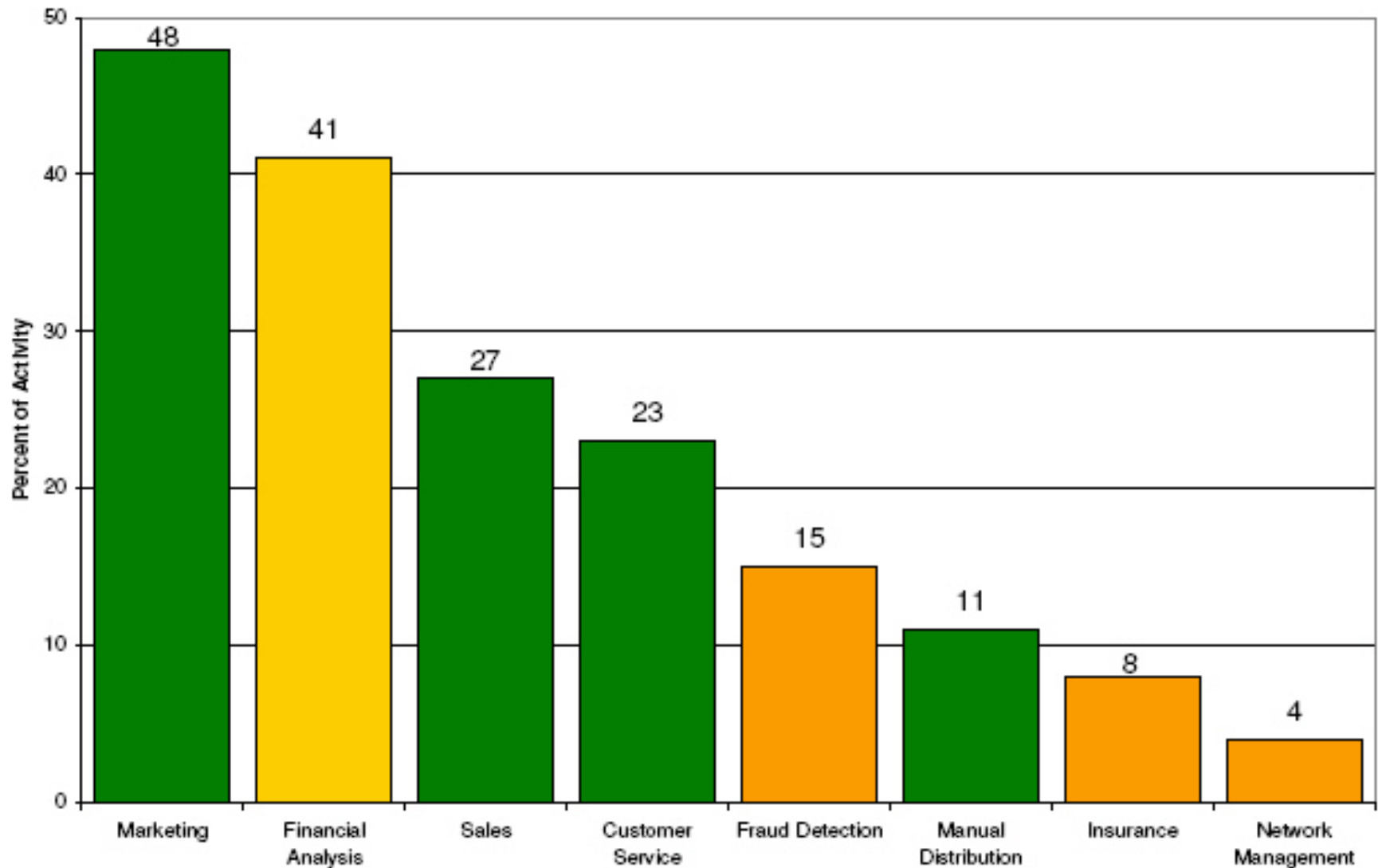




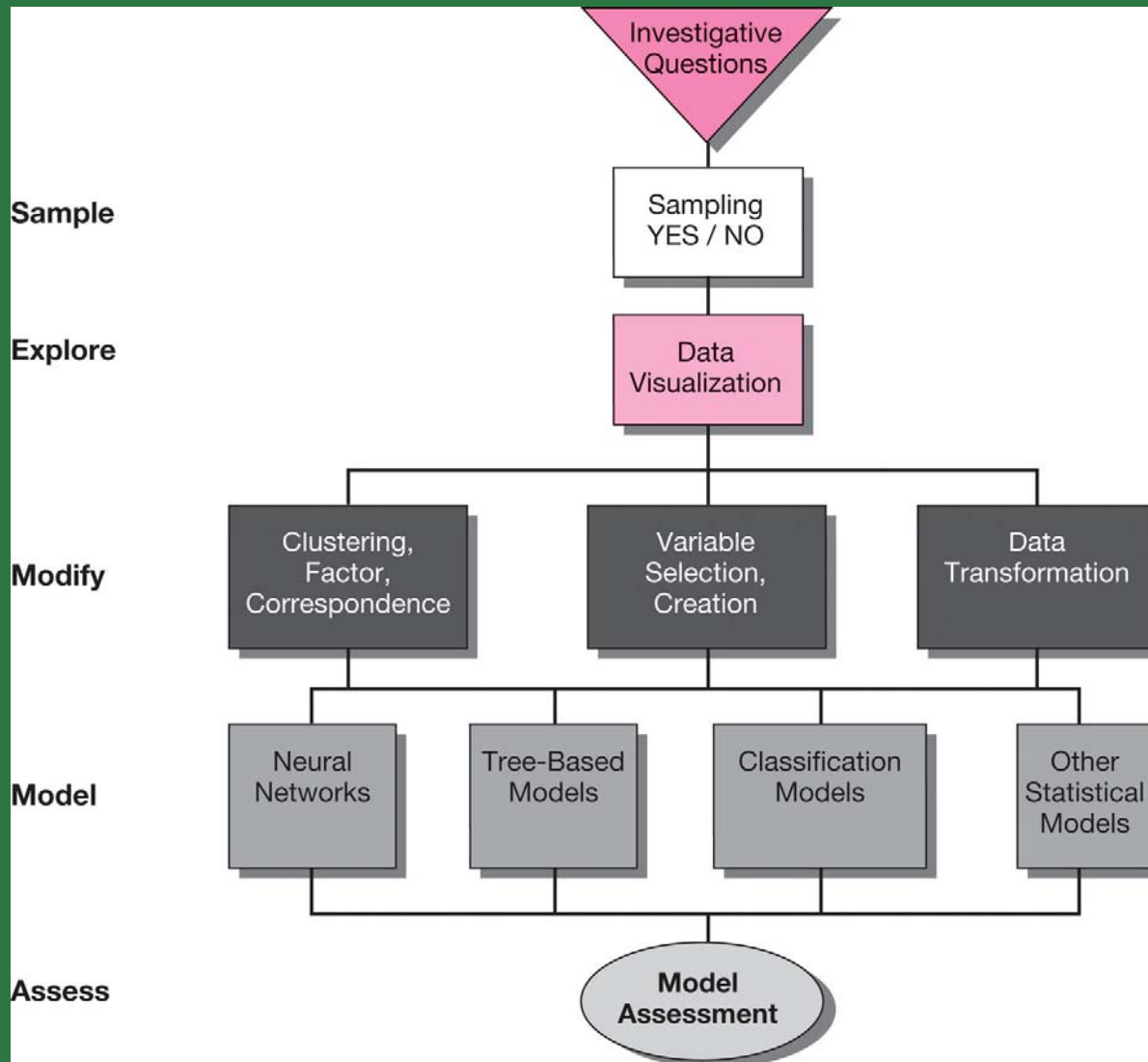
The Evolution of Data Mining

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

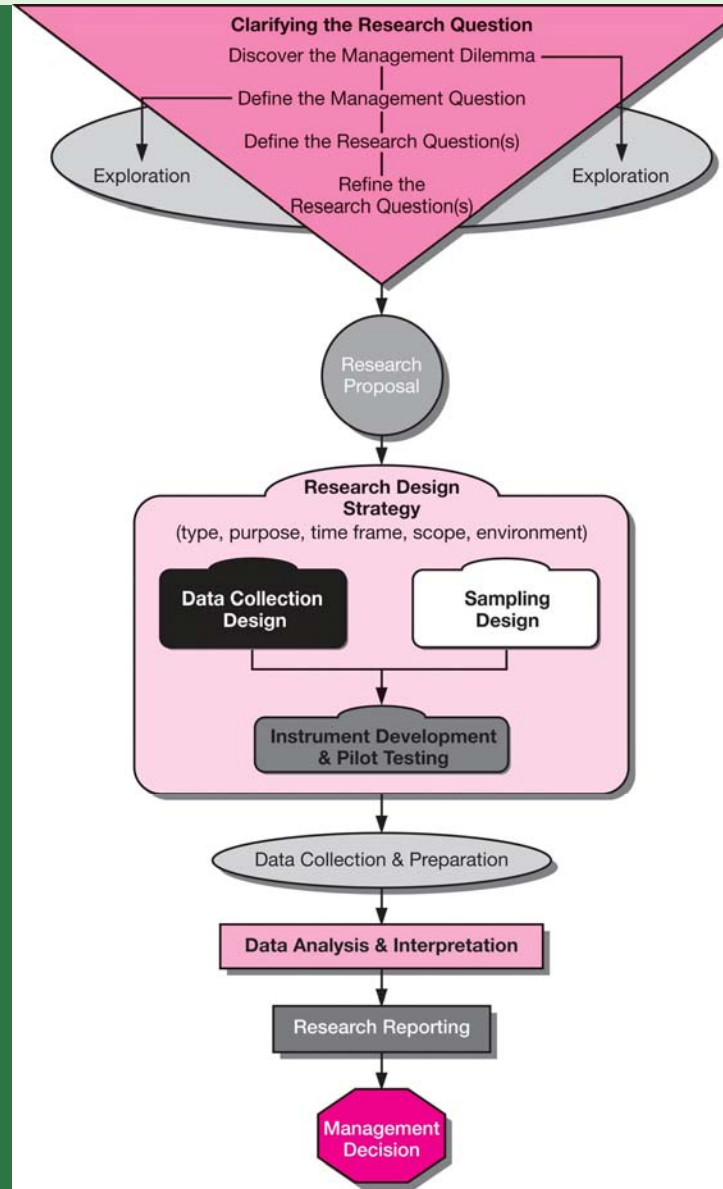
Data Mining in Business



Data-Mining Process



The Business Research Process

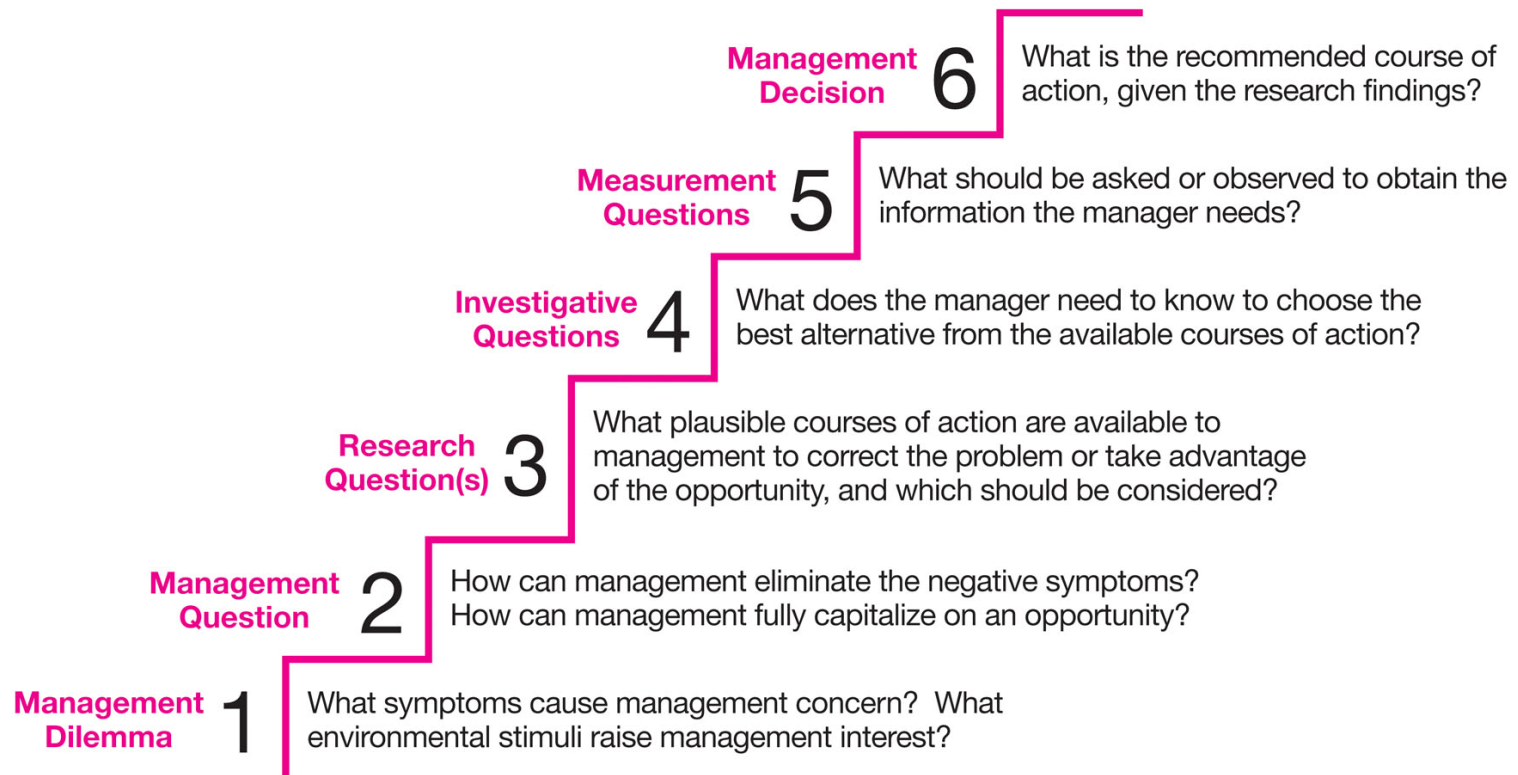


Stage 1: Clarifying the Research Question



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

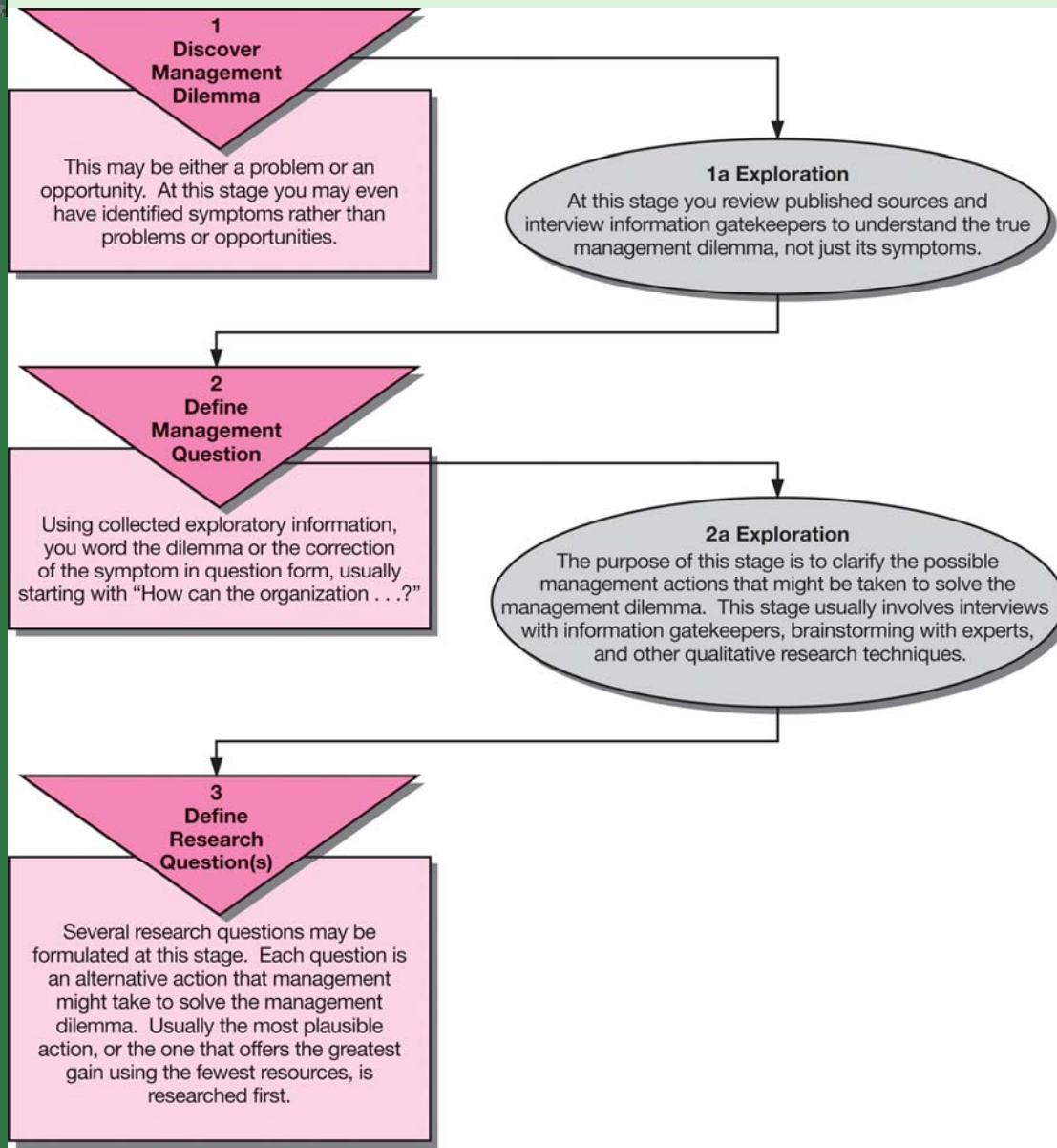
What is the likelihood that we will lose excellent salespeople in the South and Northeast if we implement the compensation change? What is the likelihood that current customer satisfaction in these regions will decrease? What is the likelihood that future sales to existing customers will be lost?

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.

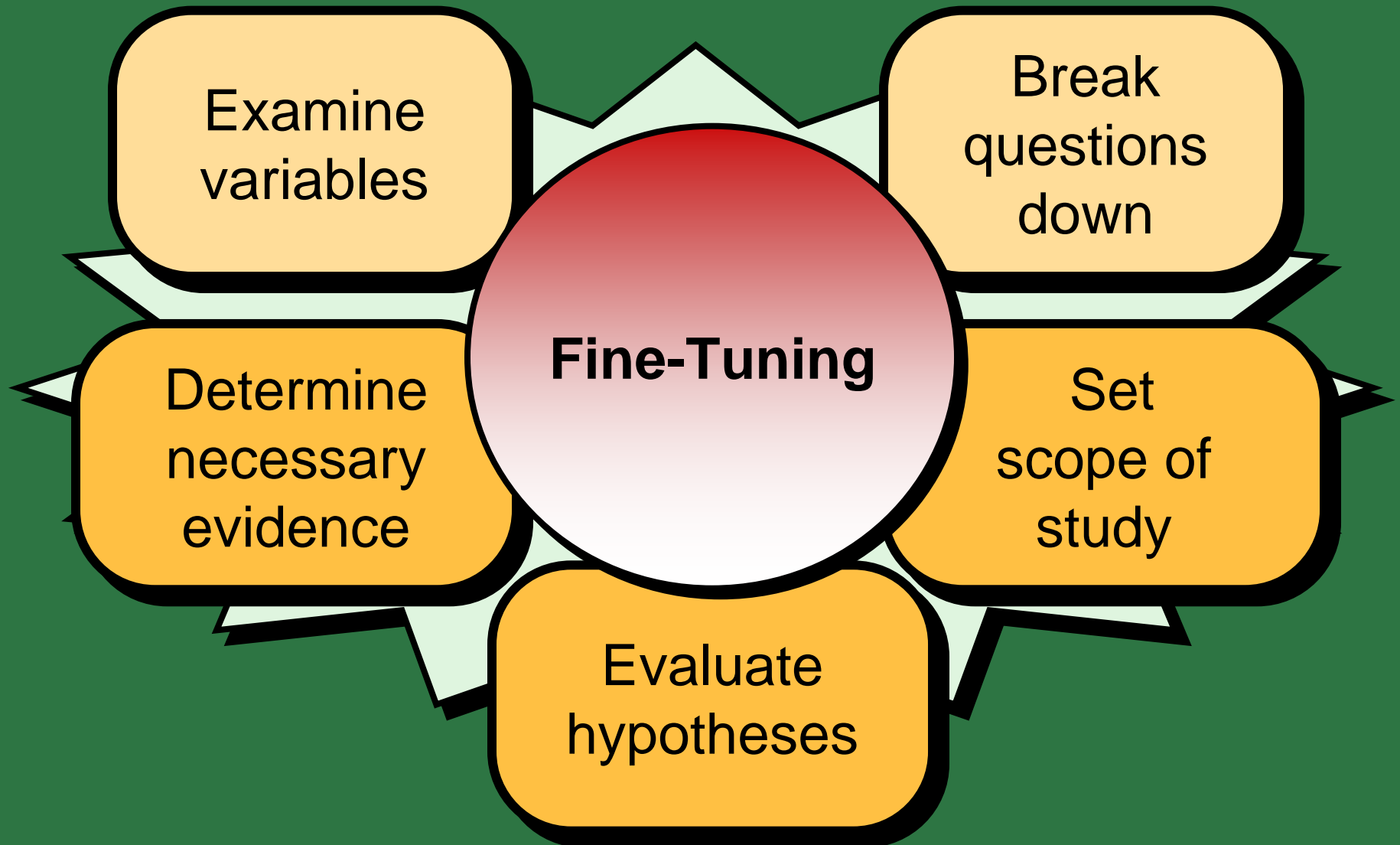
Formulating the Research Question



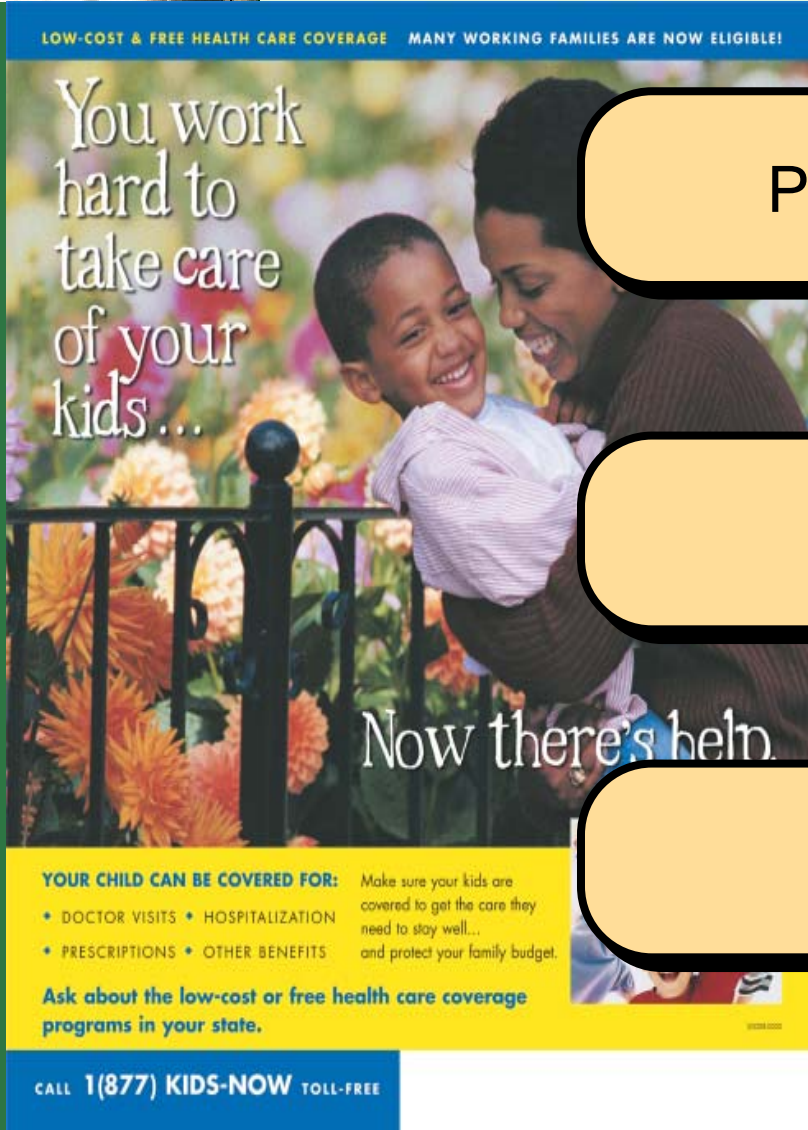
Types of Management Questions

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



Investigative Questions



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Now there's help.

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Make sure your kids are covered to get the care they need to stay well... and protect your family budget.

Ask about the low-cost or free health care coverage programs in your state.

CALL 1(877) KIDS-NOW TOLL-FREE

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

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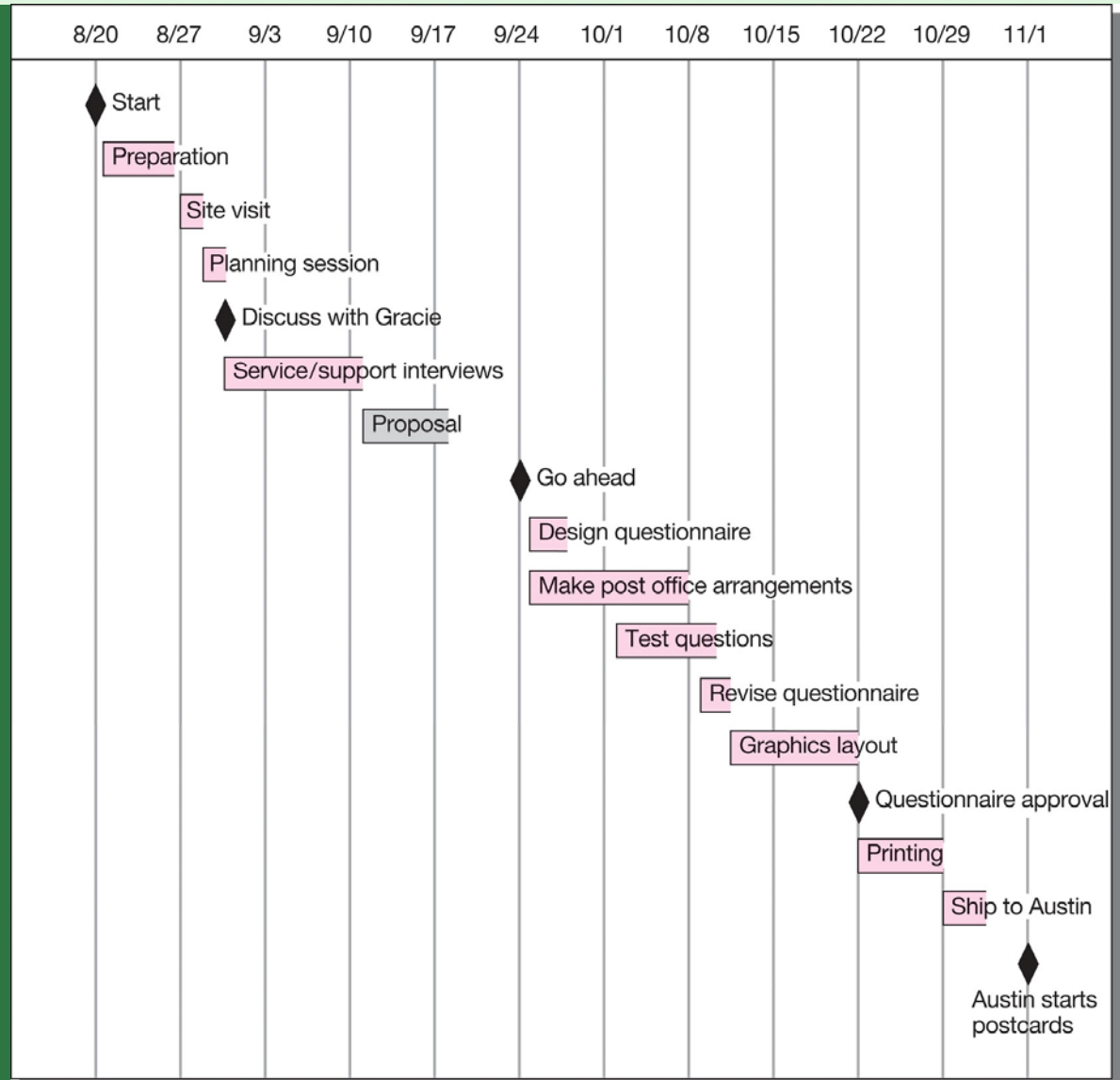



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Gantt Chart

MindWriter Project Plan



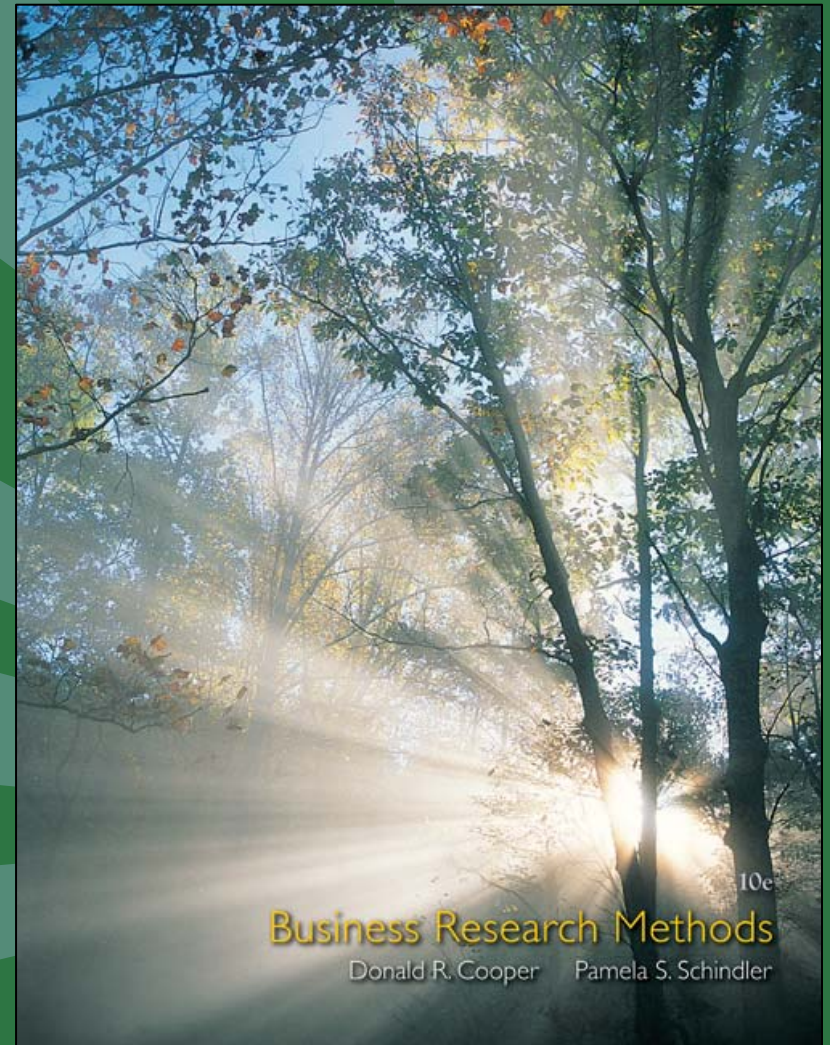


Key Terms

- | | |
|---|--|
| <ul style="list-style-type: none">• Bibliography• Bibliographic Database• Data Mart• Data Mining• Data Visualization• Data Warehouse• Dictionary• Directory• Encyclopedia• Expert interview• Exploratory research• Handbook• Index• Individual depth interview | <ul style="list-style-type: none">• Investigative questions• Literature search• Management question• Measurement question<ul style="list-style-type: none">– Custom-designed– Predesigned• Primary sources• Research questions• Secondary sources• Source evaluation<ul style="list-style-type: none">– 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.	3. Construct a search query.
<ul style="list-style-type: none"> ▪ Review and evaluate search results. 	<ul style="list-style-type: none"> ▪ Review and evaluate search results.
<ul style="list-style-type: none"> ▪ Modify the search query, if necessary. 	<ul style="list-style-type: none"> ▪ 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**.

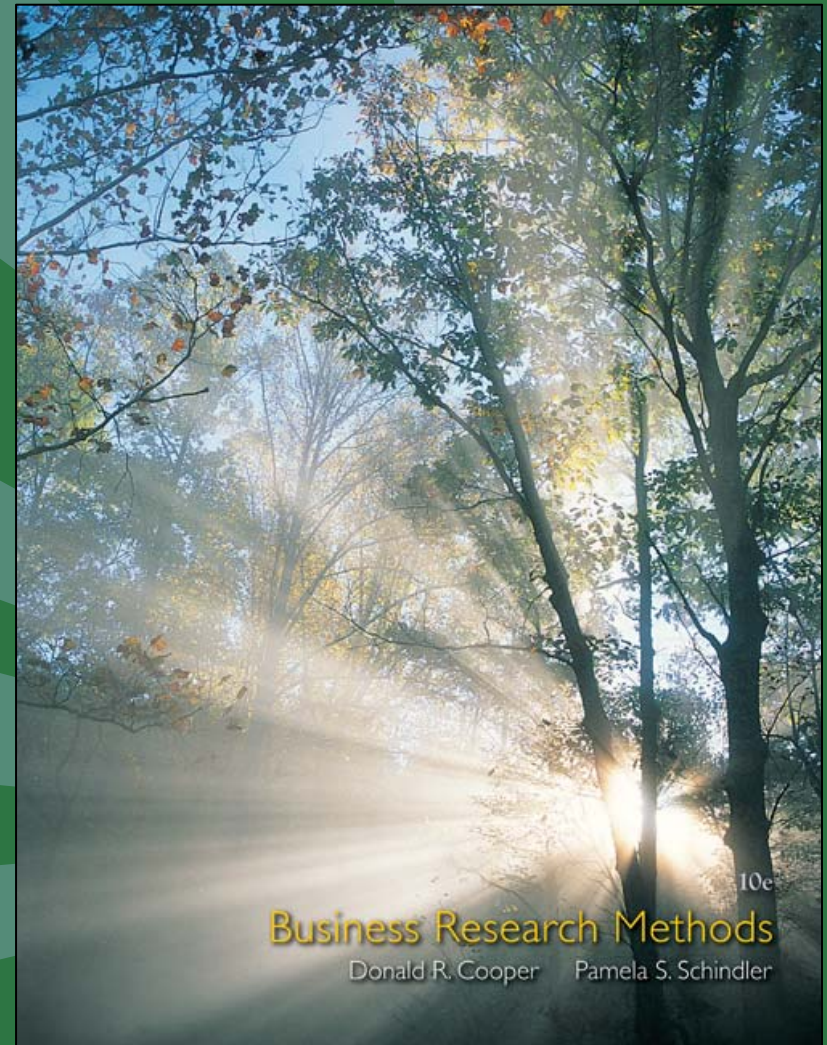
(training OR awareness OR behavior OR professional development) AND (sex* harassment OR wom*n OR men OR female OR gender) AND (lawsuit OR legal OR law OR courts)


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			
<p>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.</p>			

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?



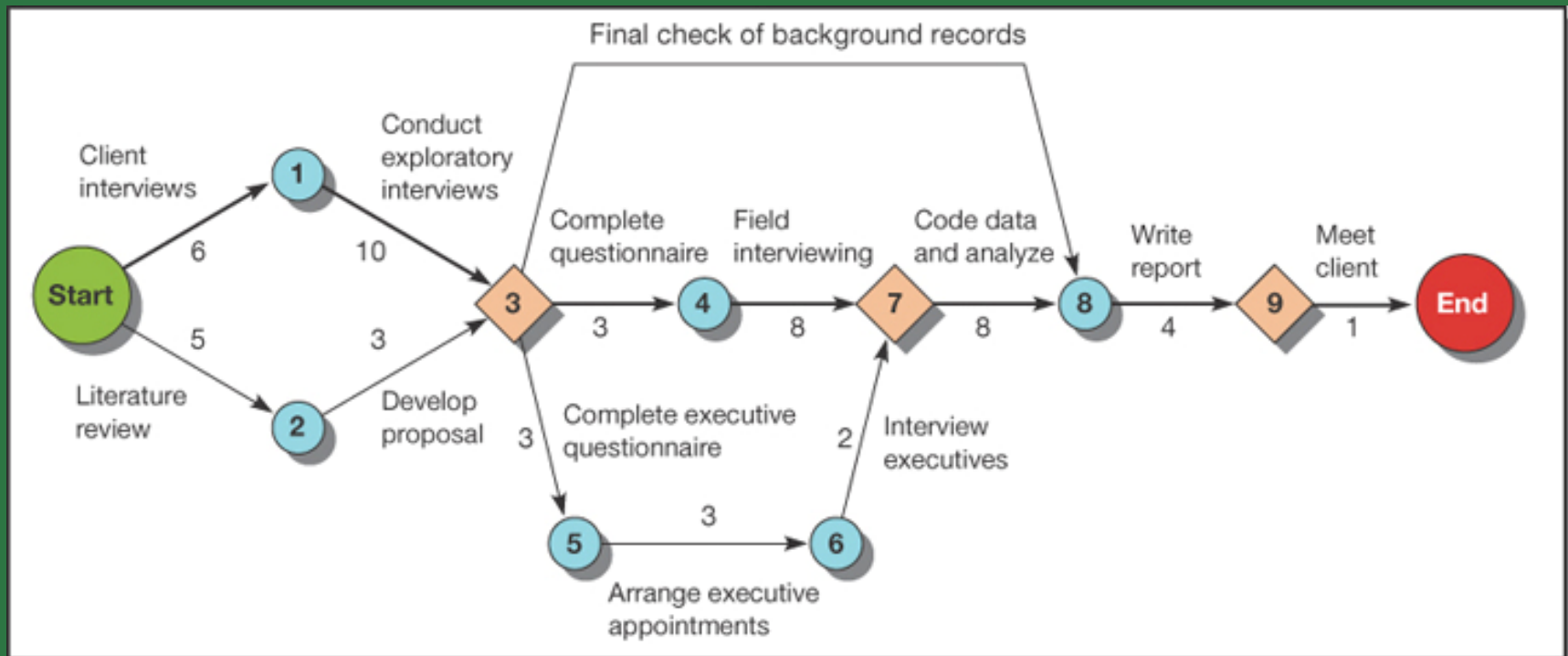
Blueprint

Plan

Guide

Framework

What Tools Are Used in Designing Research?



Milestones:

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

Critical Path:

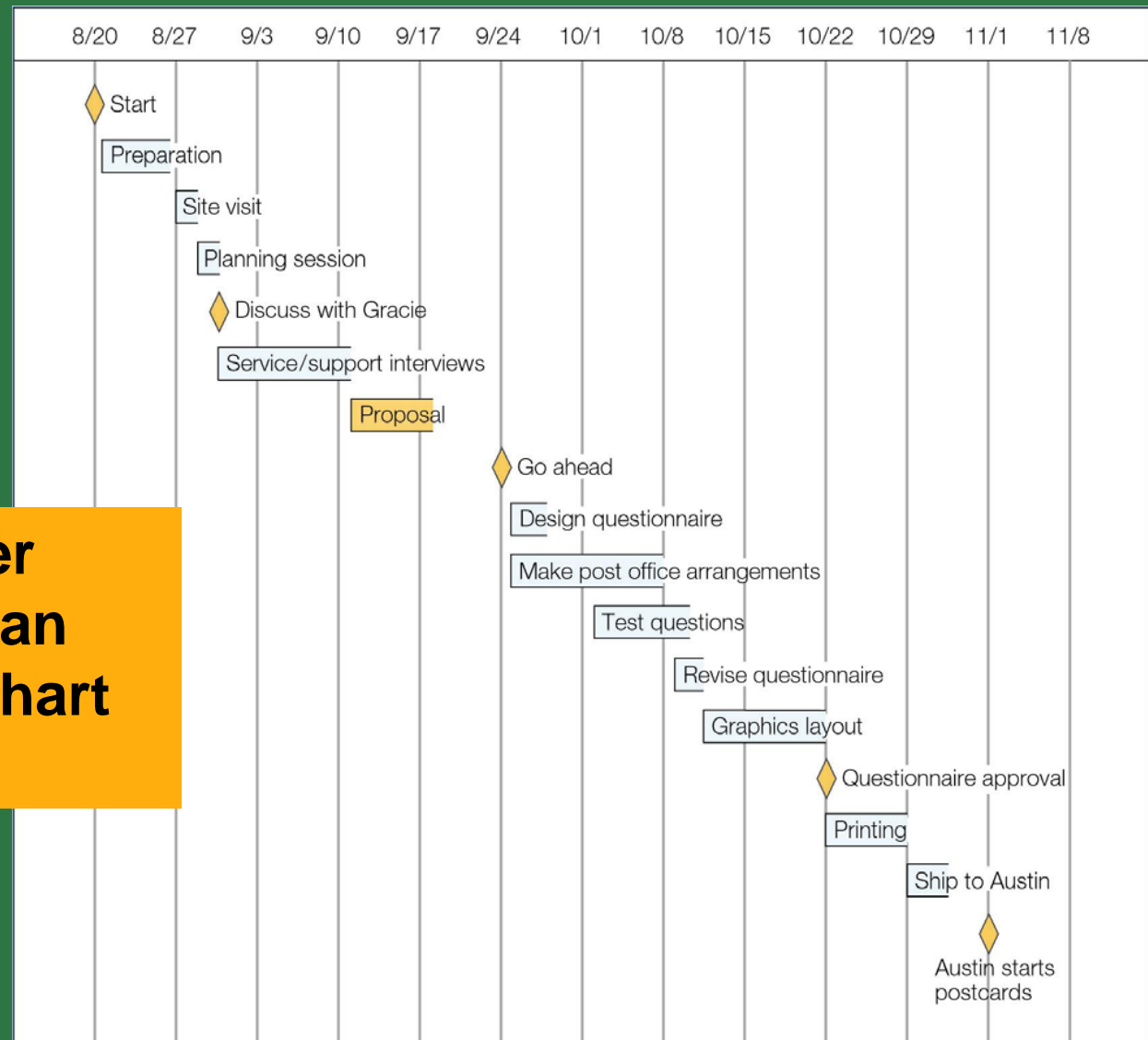
S-1-3-4-7-8-9-E

Time to Completion:

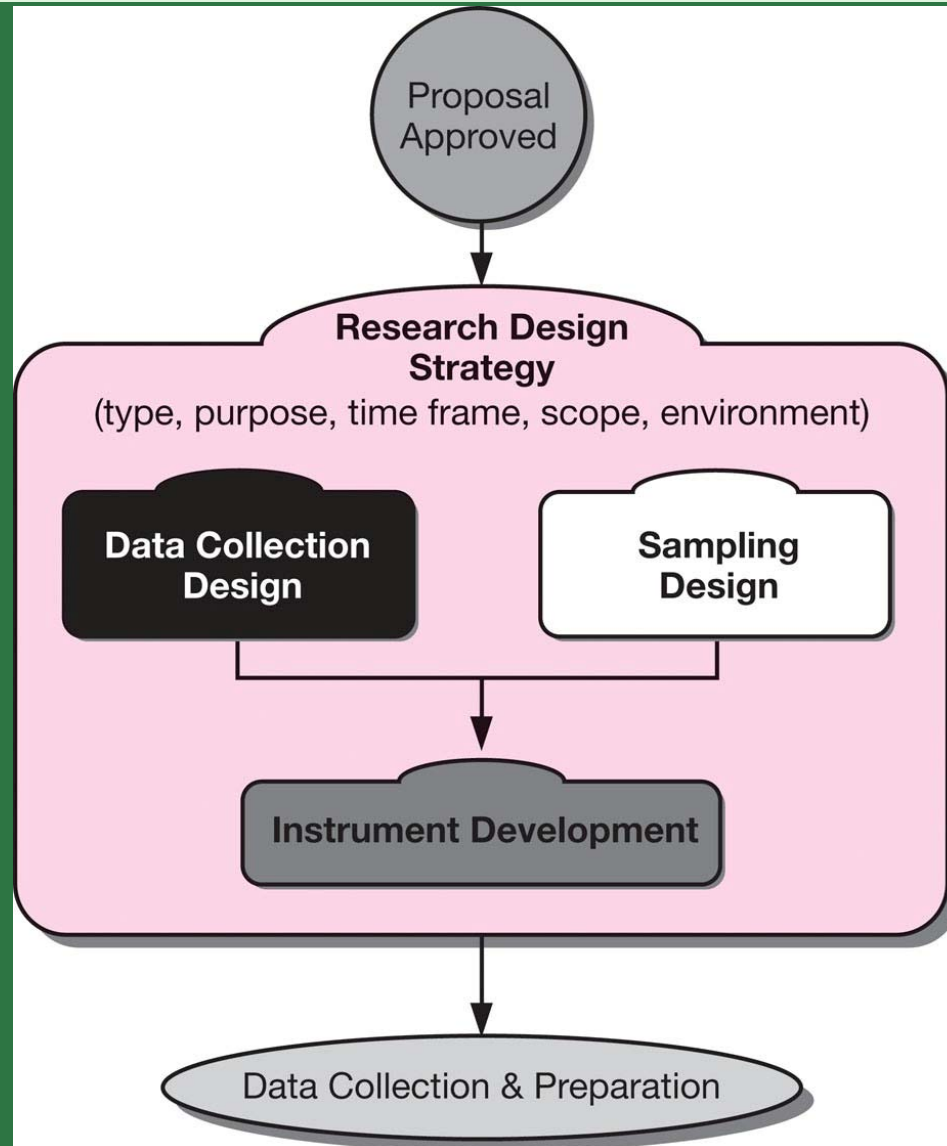
40 working days

What Tools Are Used in Designing Research?

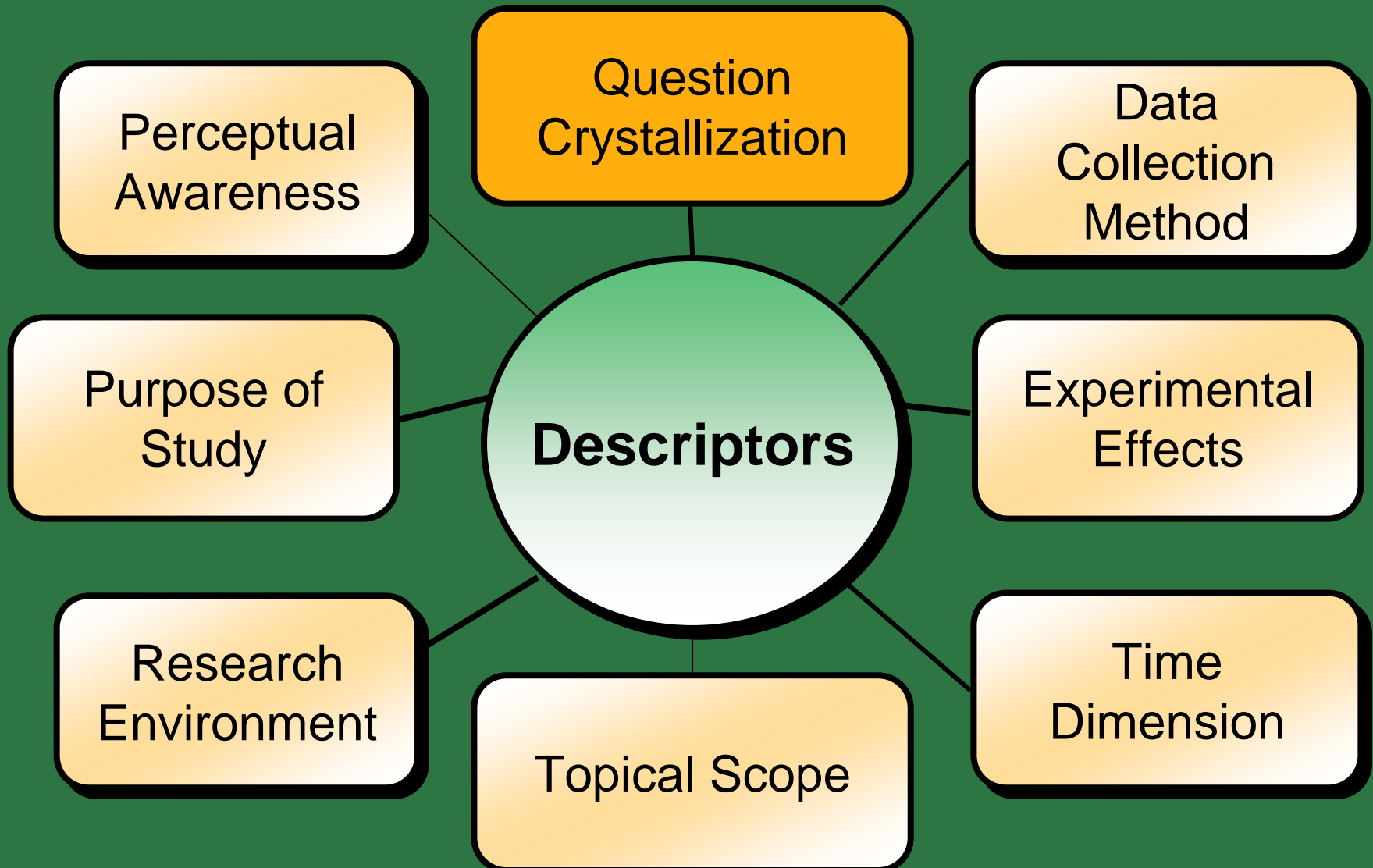
**MindWriter
Project Plan
in Gantt chart
format**



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



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

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

Appleton, WI
Atlanta
Chicago
Columbus

Dallas
Kansas City
Los Angeles
Minneapolis

Philadelphia
Phoenix
Seattle
St. Louis



Experience Surveys

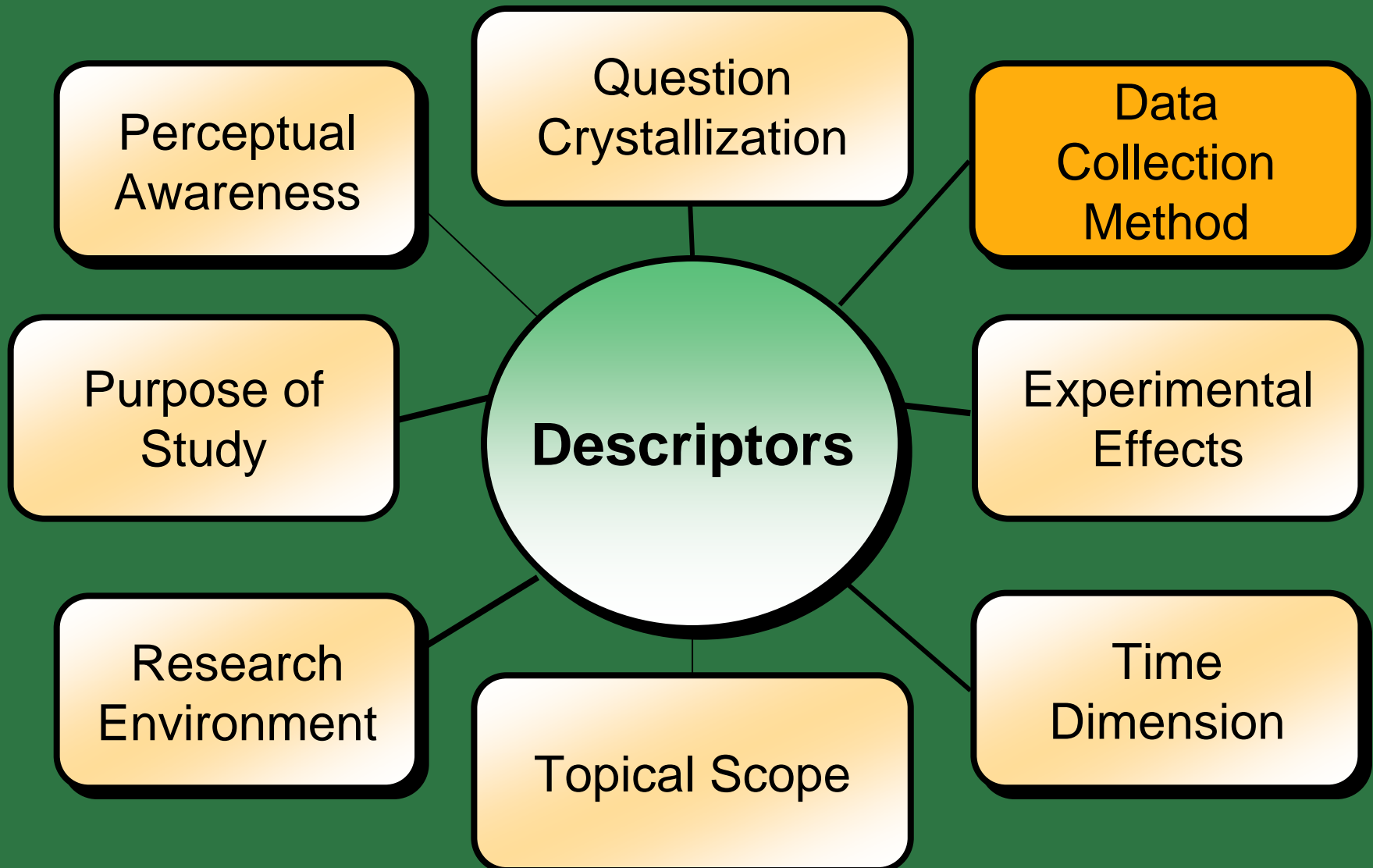
- What is being done?
- What has been tried in the past with or without success?
- How have things changed?
- Who is involved in the decisions?
- What problem areas can be seen?
- Whom can we count on to assist or participate in the research?

Focus Groups

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



Descriptors of Research Design



Data Collection Method

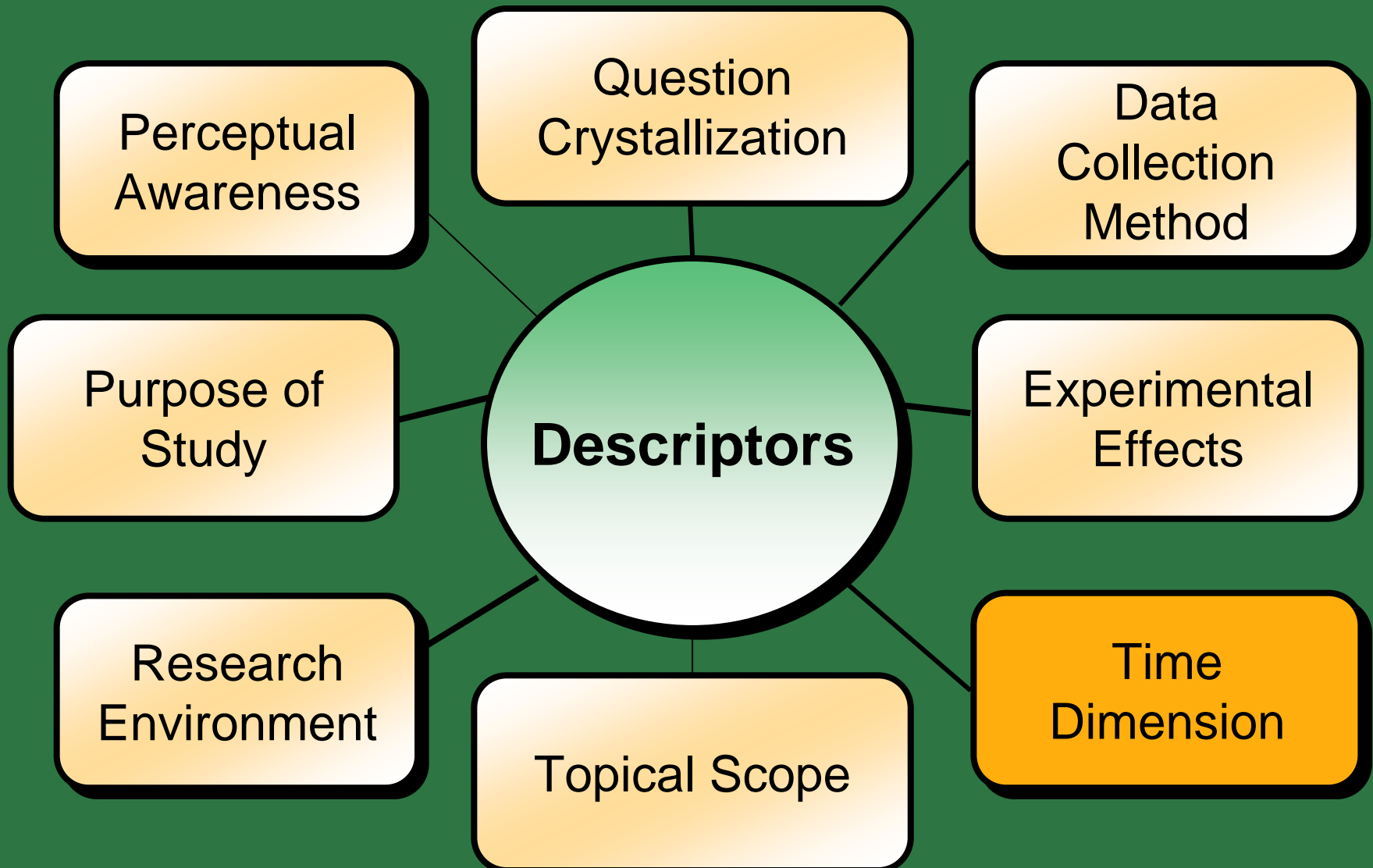
Monitoring



Communication



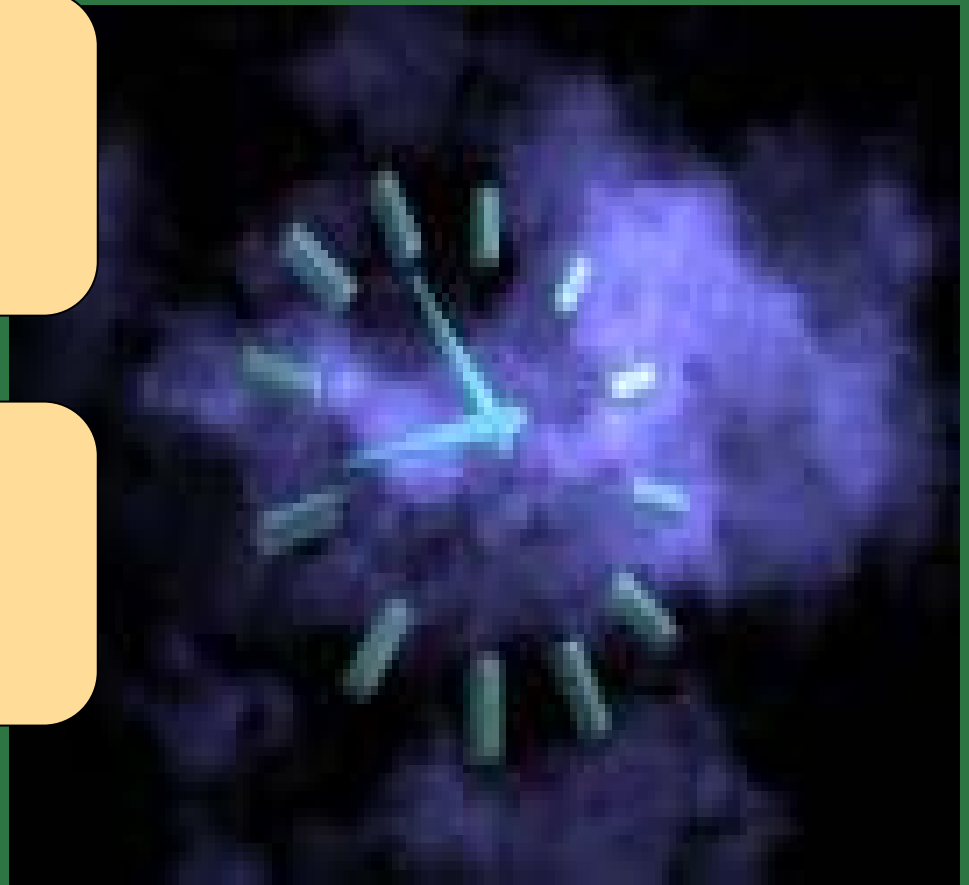
Descriptors of Research Design



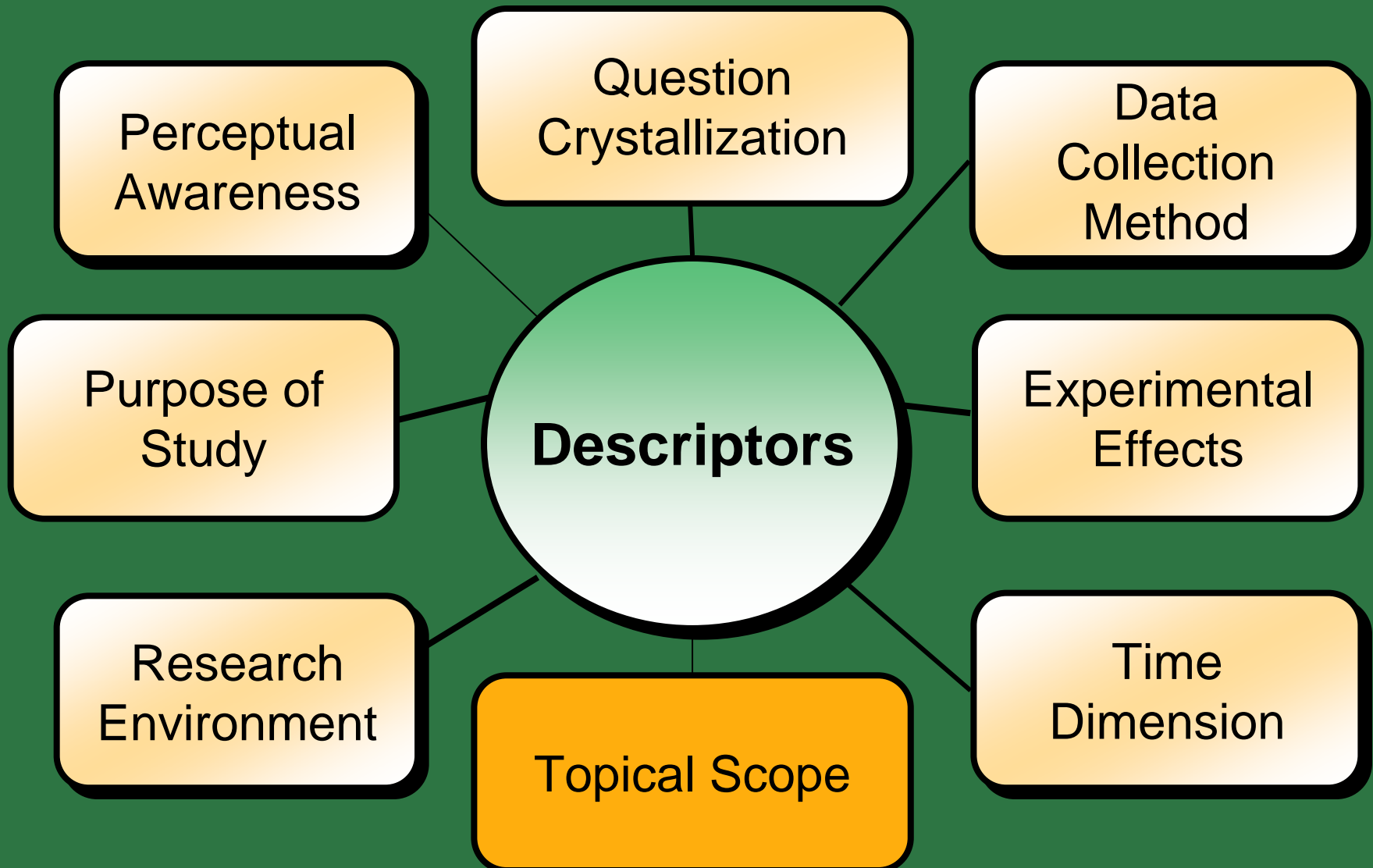
The Time Dimension


Cross-sectional

Longitudinal



Descriptors of Research Design





The Topical Scope

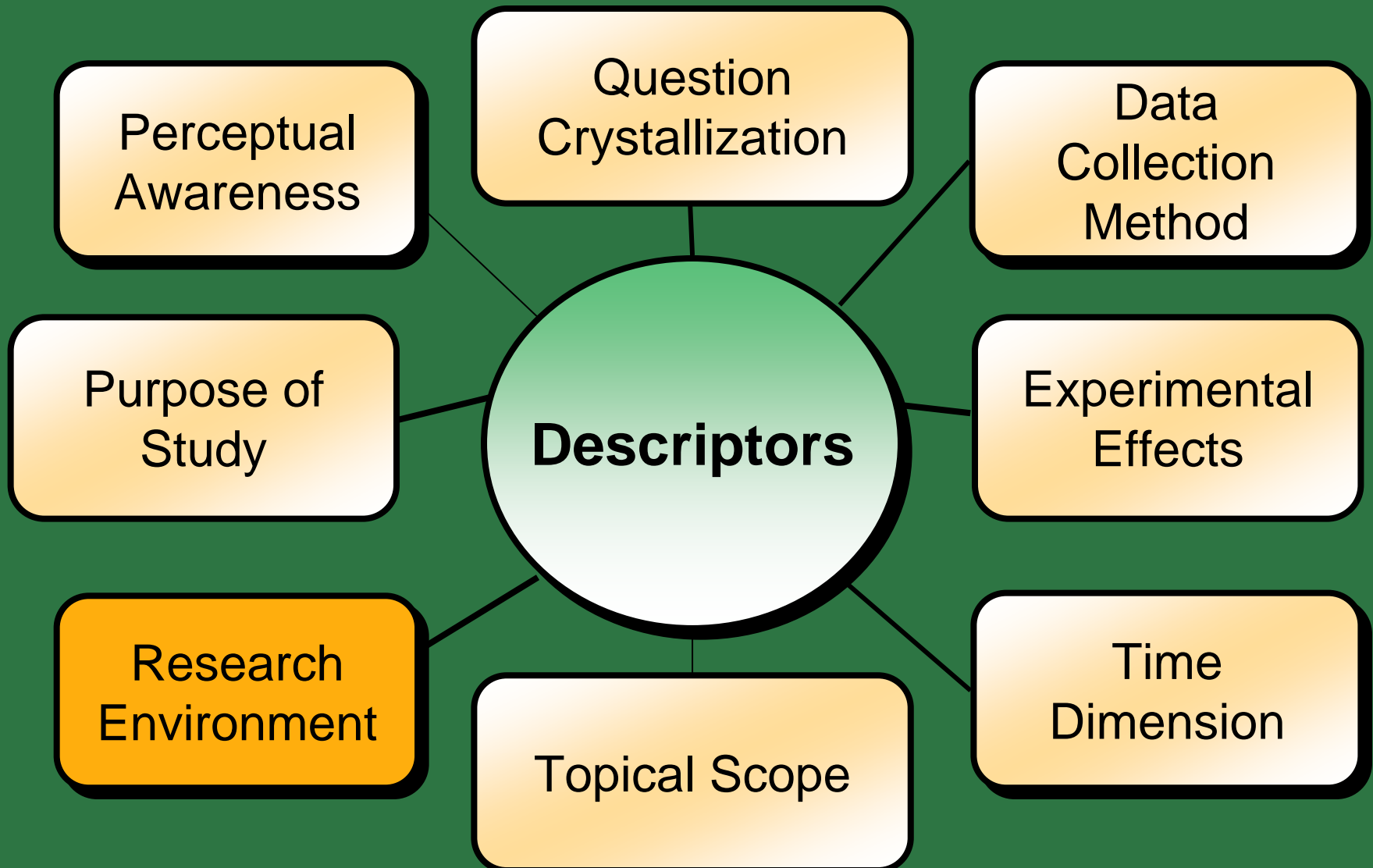
Statistical Study

- Breadth
- Population inferences
- Quantitative
- Generalizable findings

Case Study

- Depth
- Detail
- Qualitative
- Multiple sources of information

Descriptors of Research Design



The Research Environment

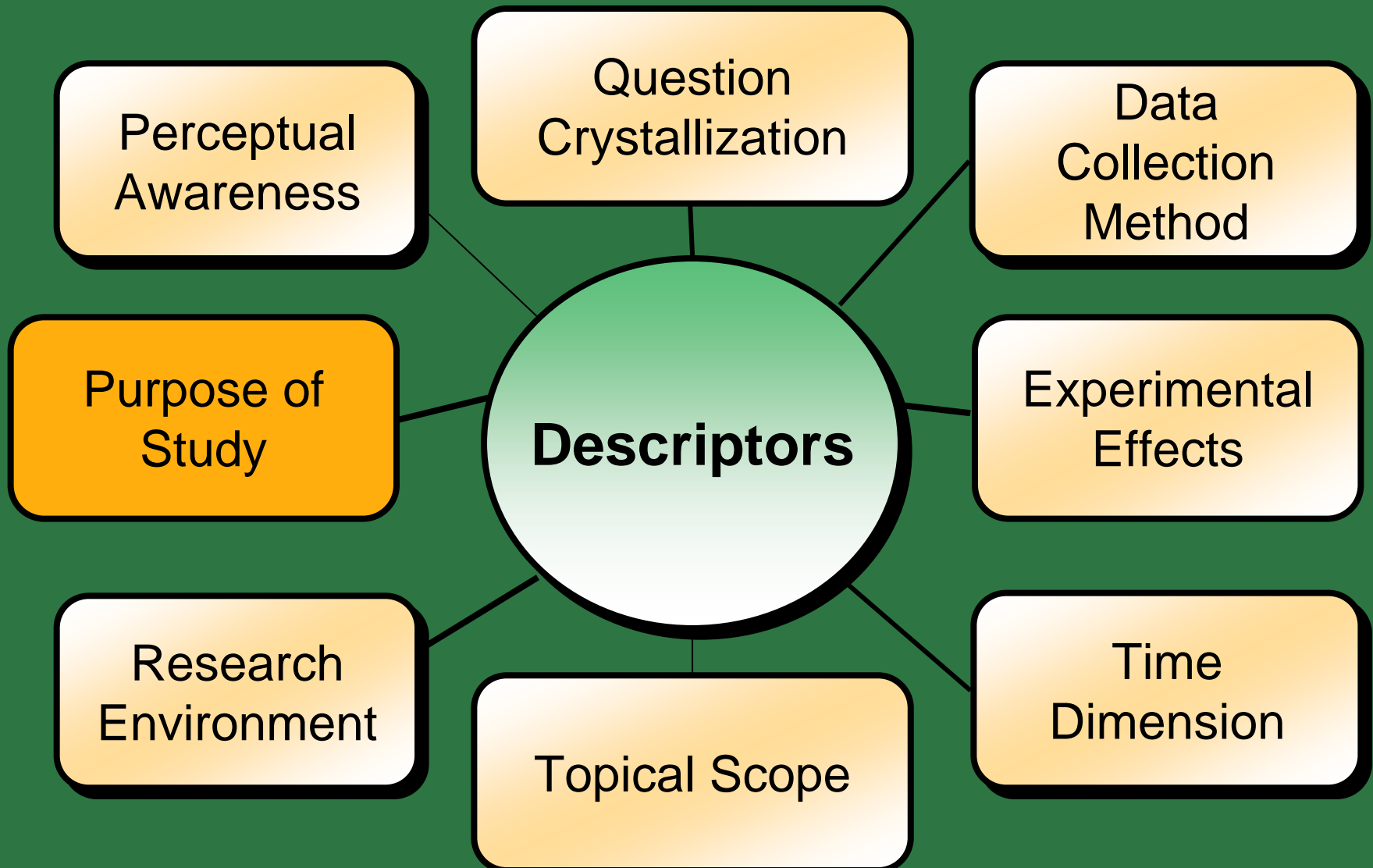
Field conditions

Lab conditions

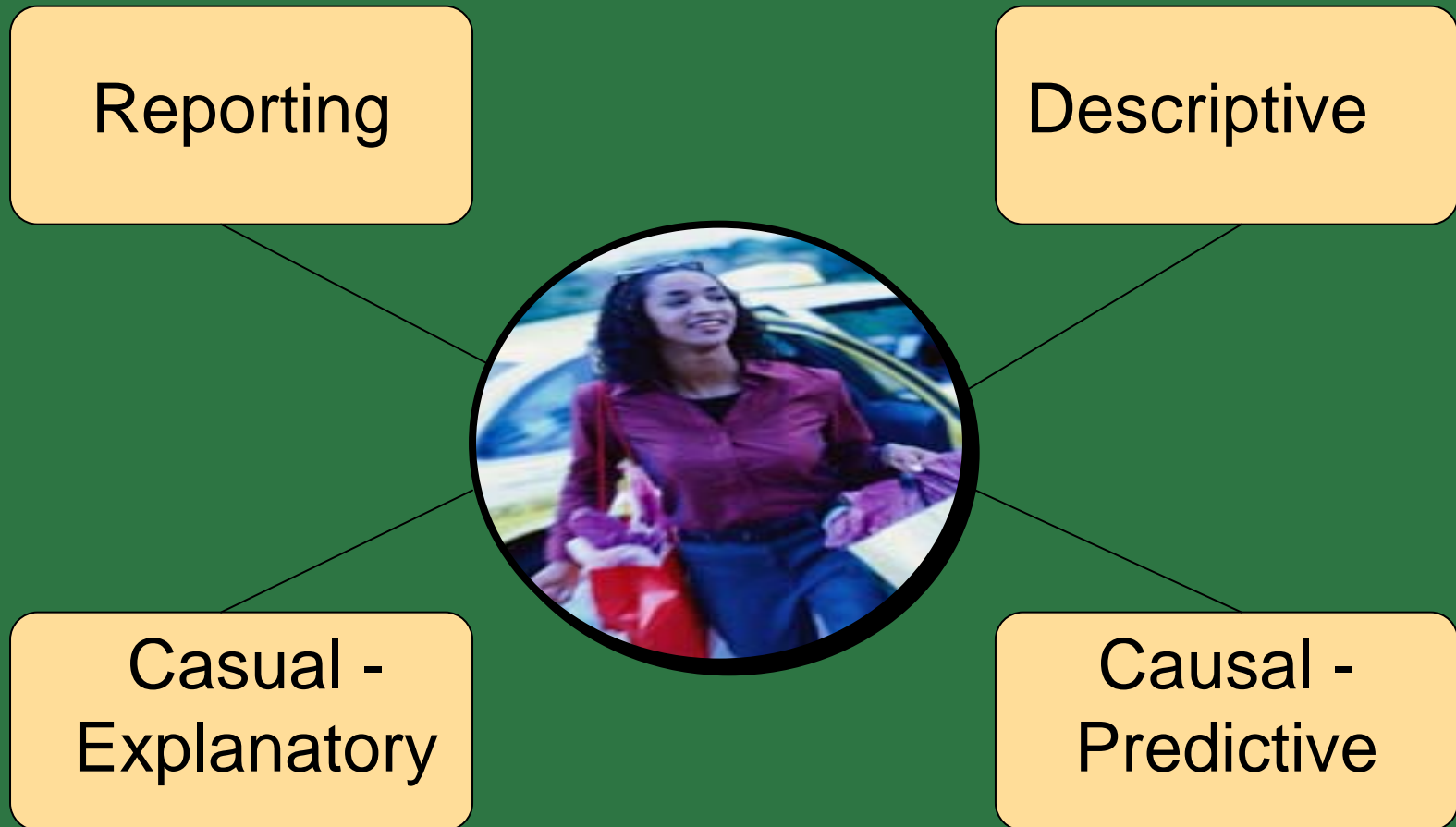
Simulations



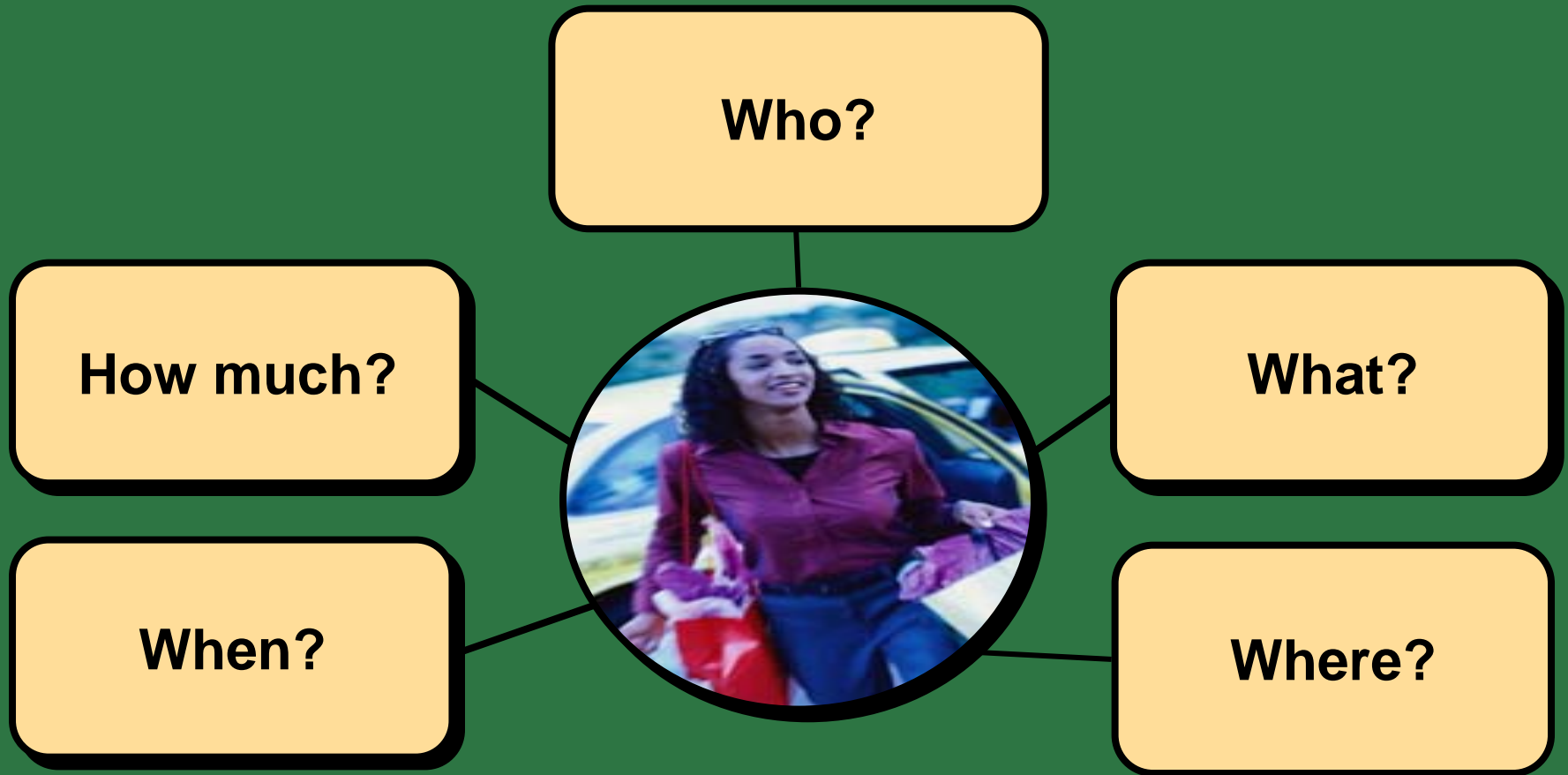
Descriptors of Research Design



Purpose of the Study



Descriptive Studies

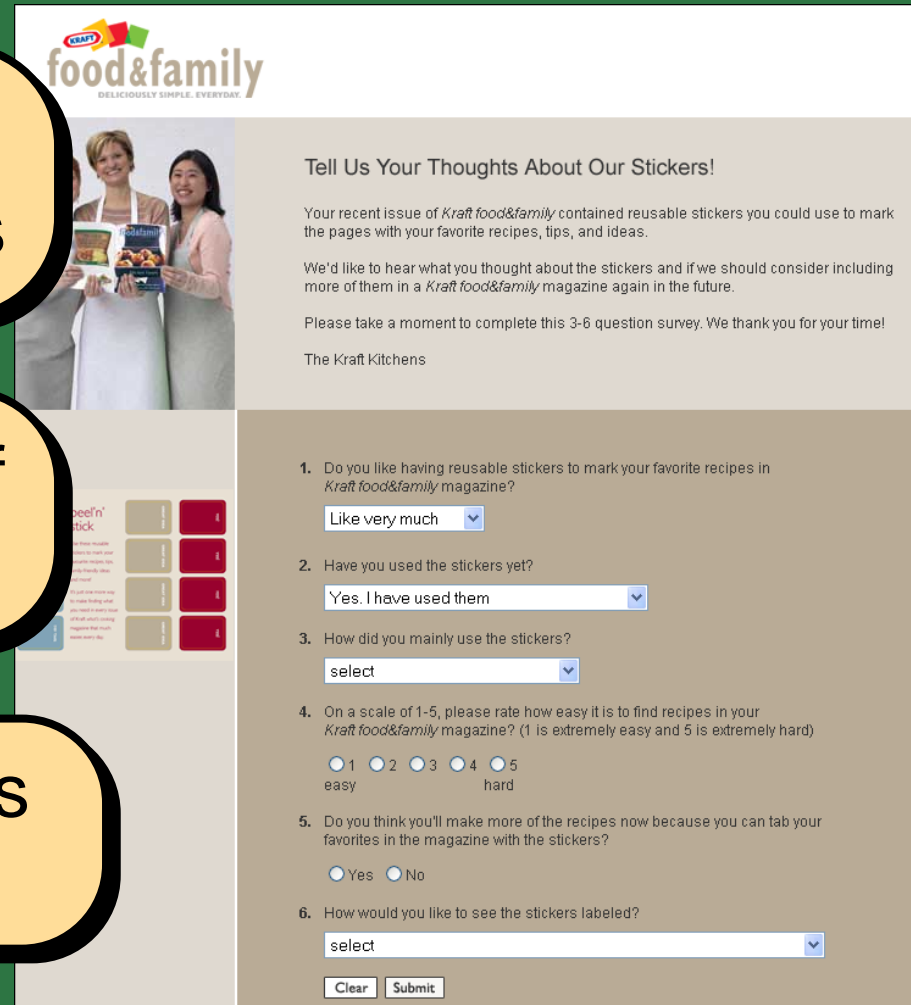


Descriptive Studies

Descriptions of
population characteristics

Estimates of frequency of
characteristics

Discovery of associations
among variables



food&family
DELICIOUSLY SIMPLE. EVERYDAY.

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.

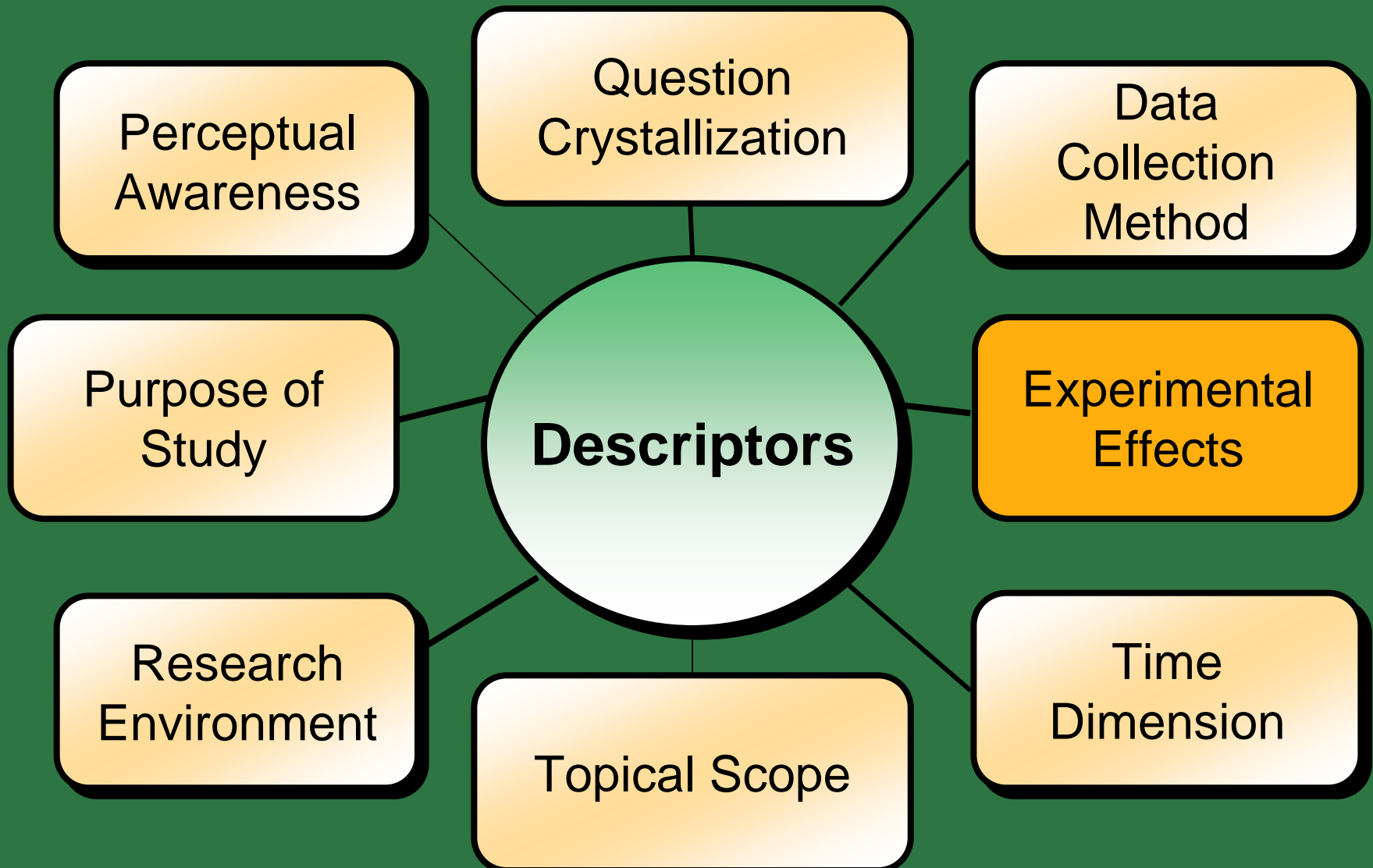
Please take a moment to complete this 3-6 question survey. We thank you for your time!


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 ▾

Clear Submit

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

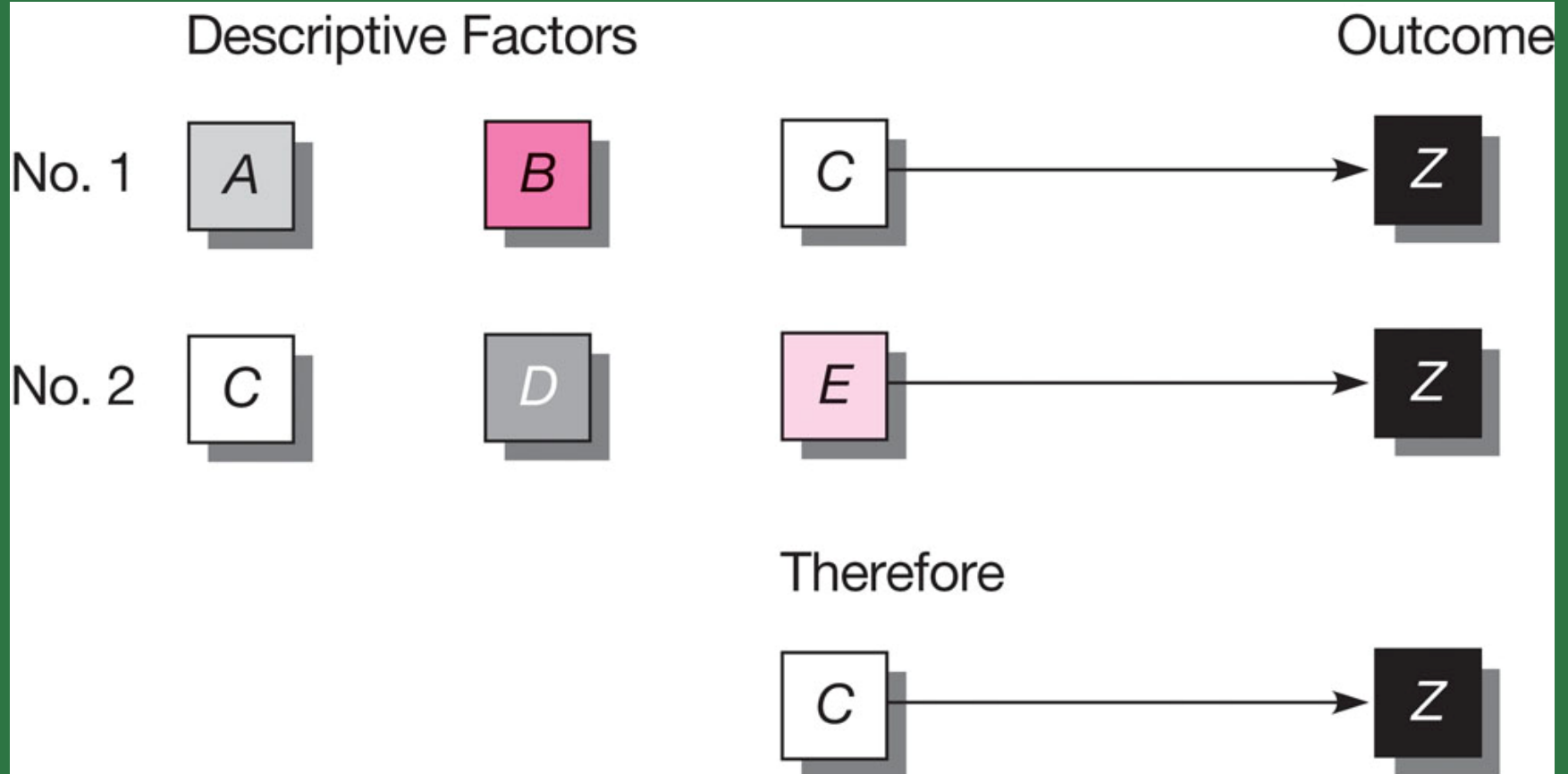


A diagram illustrating experimental design components. It features a large, orange, multi-pointed starburst shape in the center. Inside this starburst are two rectangular boxes: a green one on the left and a yellow one on the right. The green box contains the text 'Control/ Matching' and the yellow box contains the text 'Random Assignment'. The entire diagram is set against a dark green background.

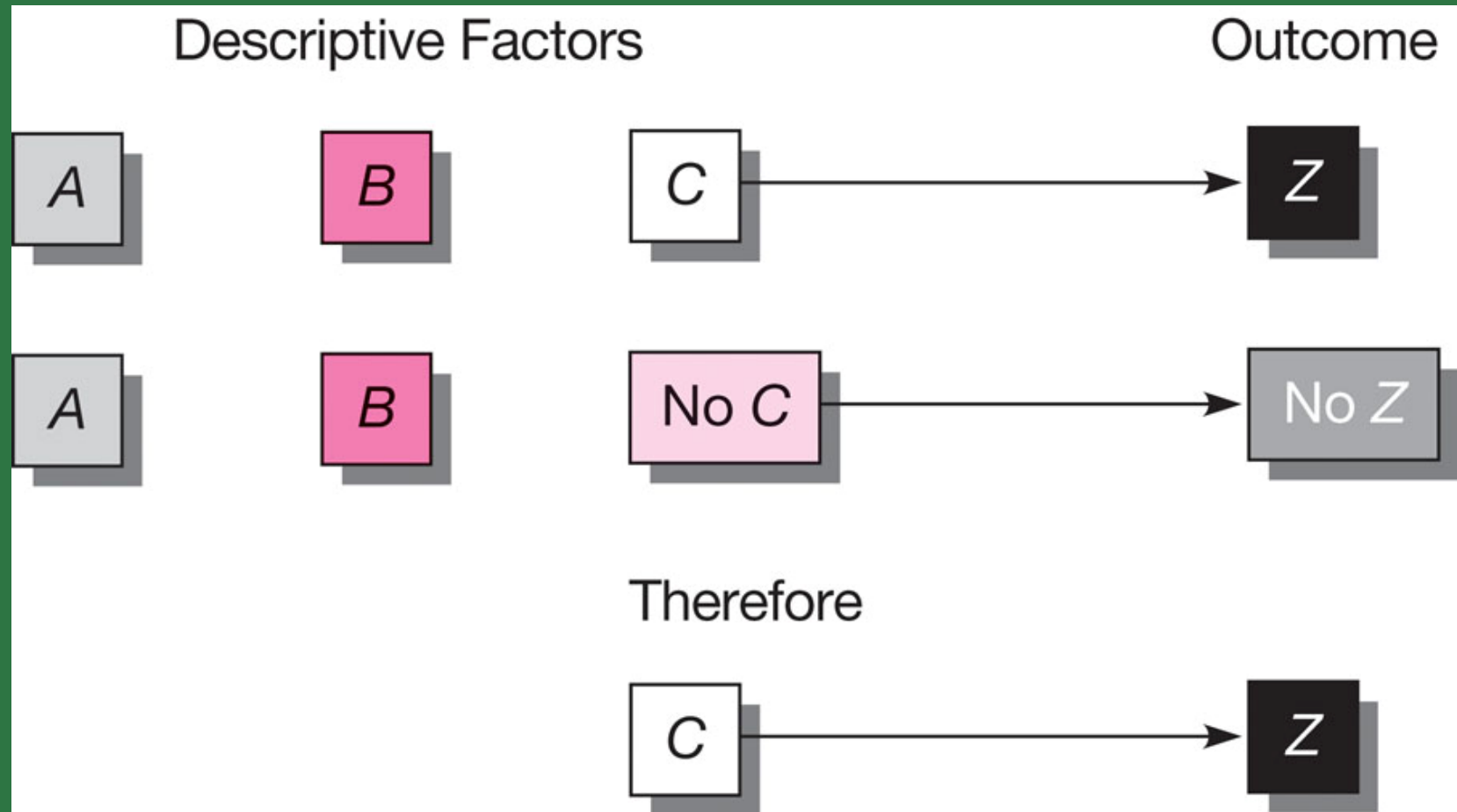
Control/
Matching

Random
Assignment

Mills Method of Agreement



Mills Method of Difference

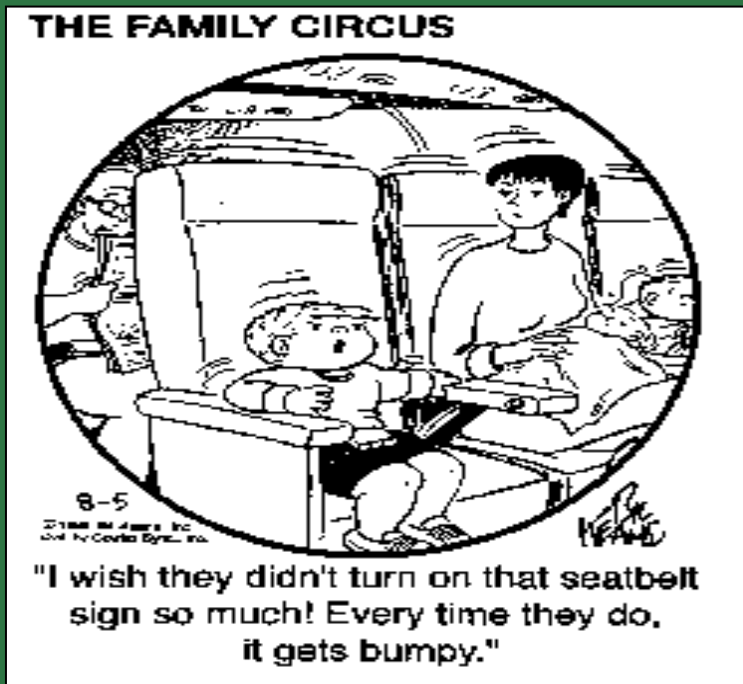


Causal Studies

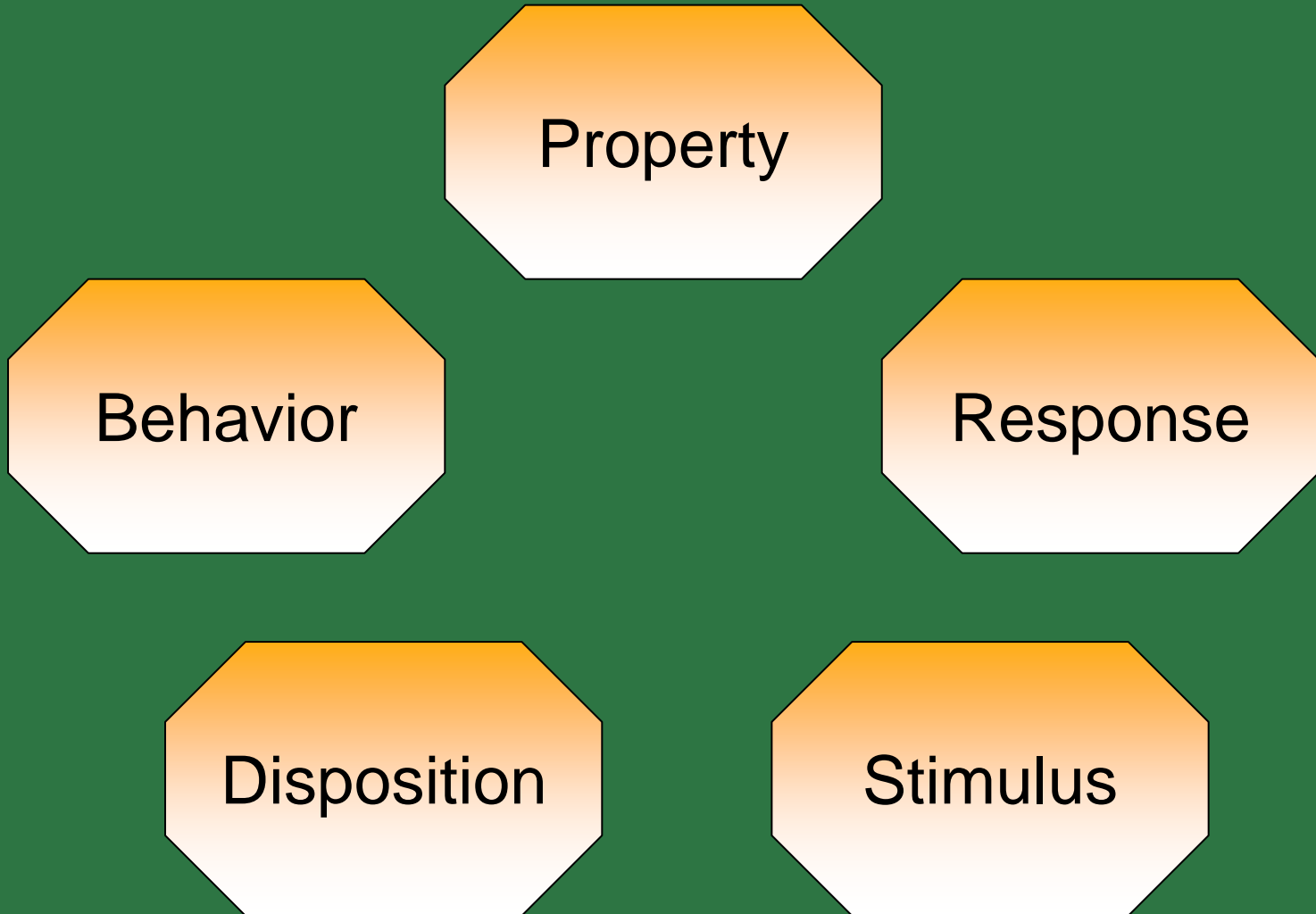
Symmetrical

Reciprocal

Asymmetrical



Understanding Casual Relationships



Asymmetrical Casual Relationships

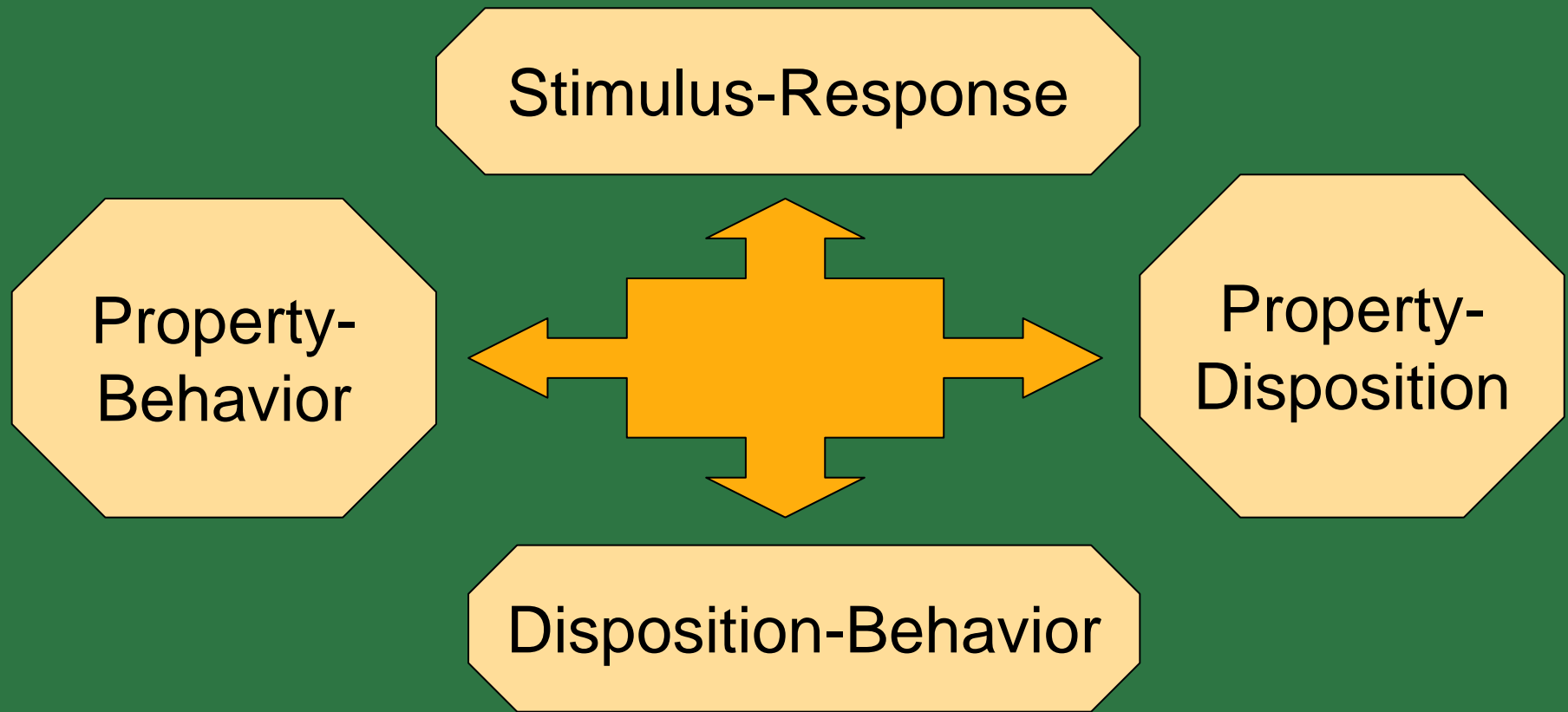


Exhibit 6-6 Types of Asymmetrical Causal Relationships

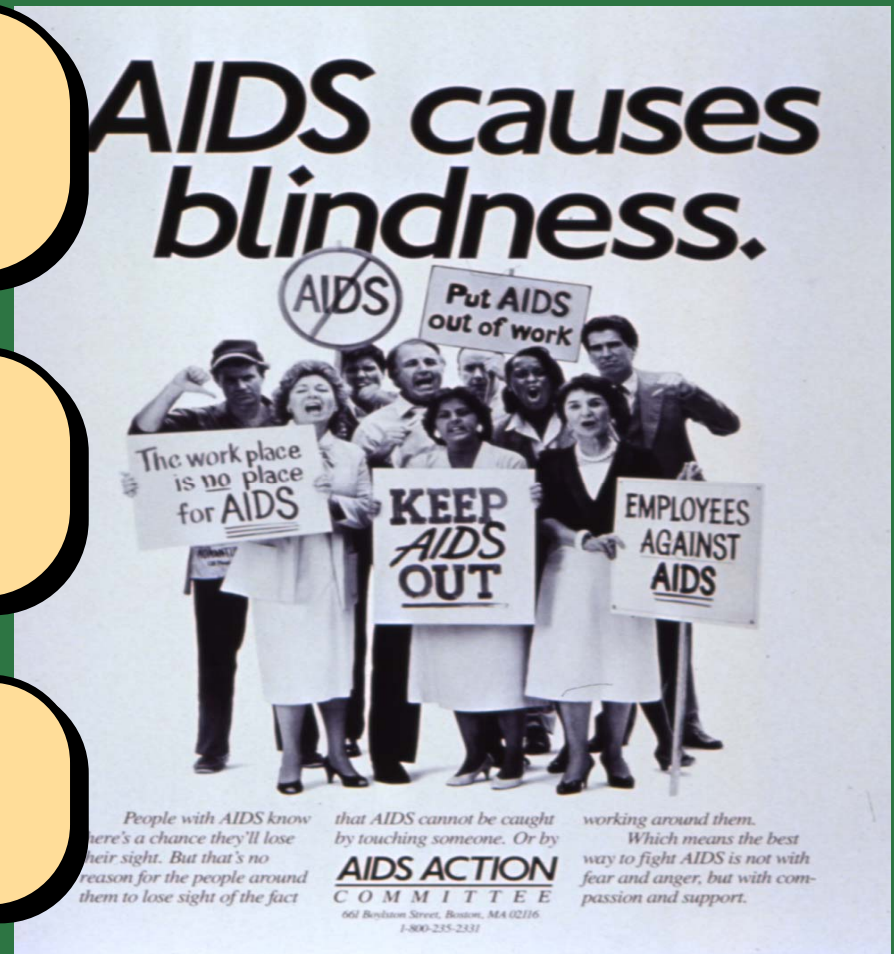
Relationship Type	Nature of Relationship	Examples
Stimulus-response	An event or change results in a response from some object.	<ul style="list-style-type: none"> • A change in work rules leads to a higher level of worker output. • A change in government economic policy restricts corporate financial decisions. • 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

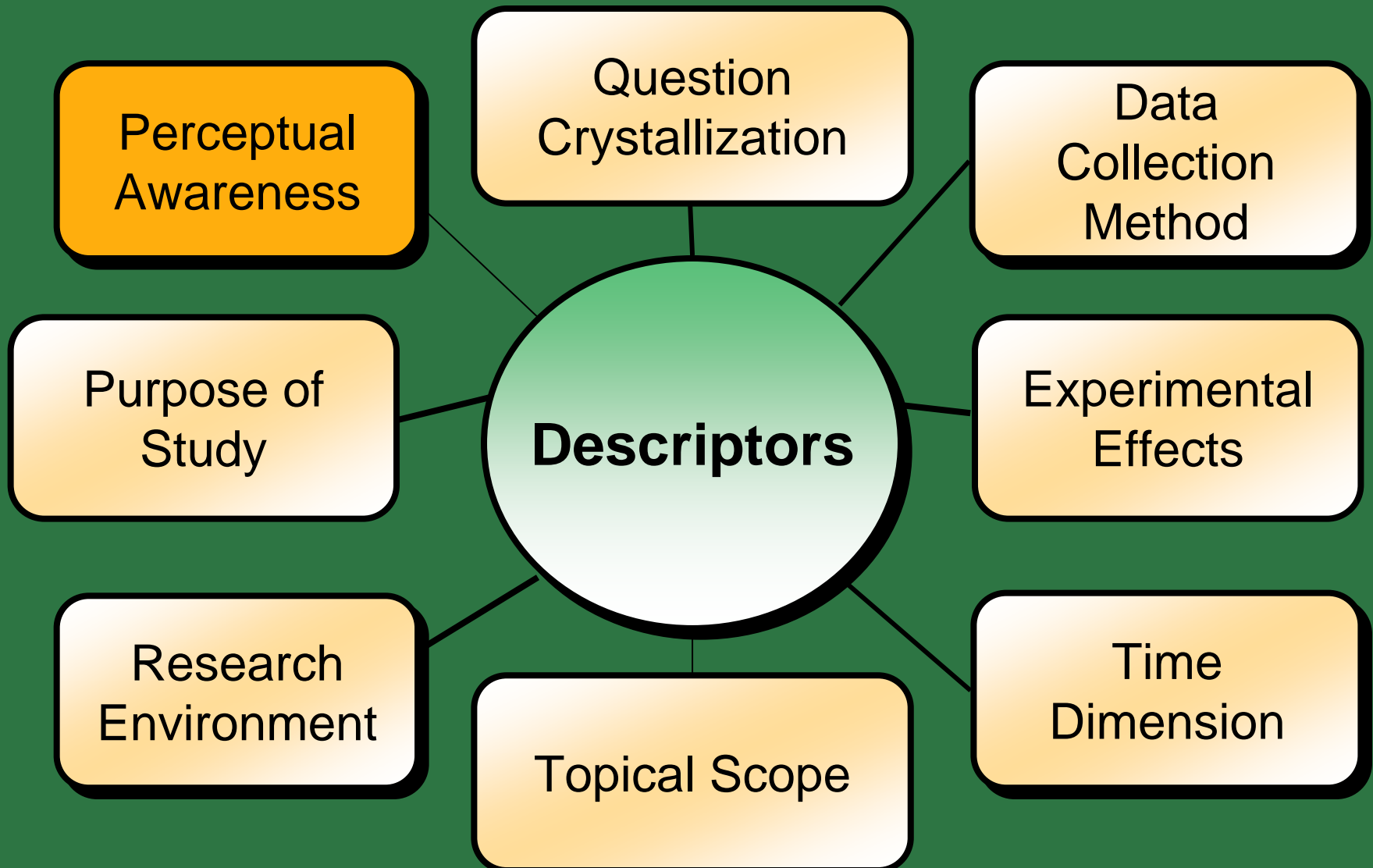
Covariation between
A and B

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

- | | |
|---|--|
| <ul style="list-style-type: none">• Asymmetrical relationship• Case study• Causal study• Causation• Children's panels• Communication study• Control• Control group• Correlation• Cross-sectional study | <ul style="list-style-type: none">• Descriptive study• Ethnographic research• Ex post facto design• Experience• Experiment• Exploratory study• Field conditions• Focus group• Formal study• Individual depth interview• Intranet |
|---|--|

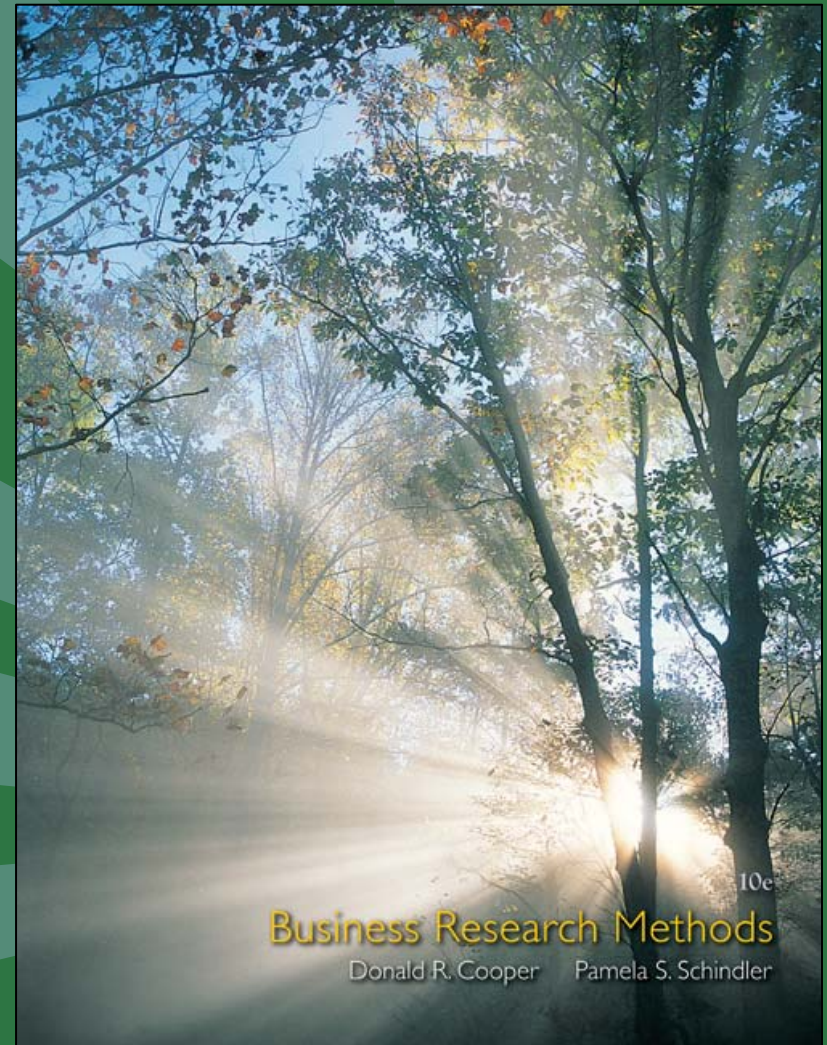



Key Terms (cont.)

- | | |
|--|--|
| <ul style="list-style-type: none">• Laboratory conditions• Longitudinal study• Matching• Monitoring• Primary data• Qualitative techniques• Random assignment | <ul style="list-style-type: none">• 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.

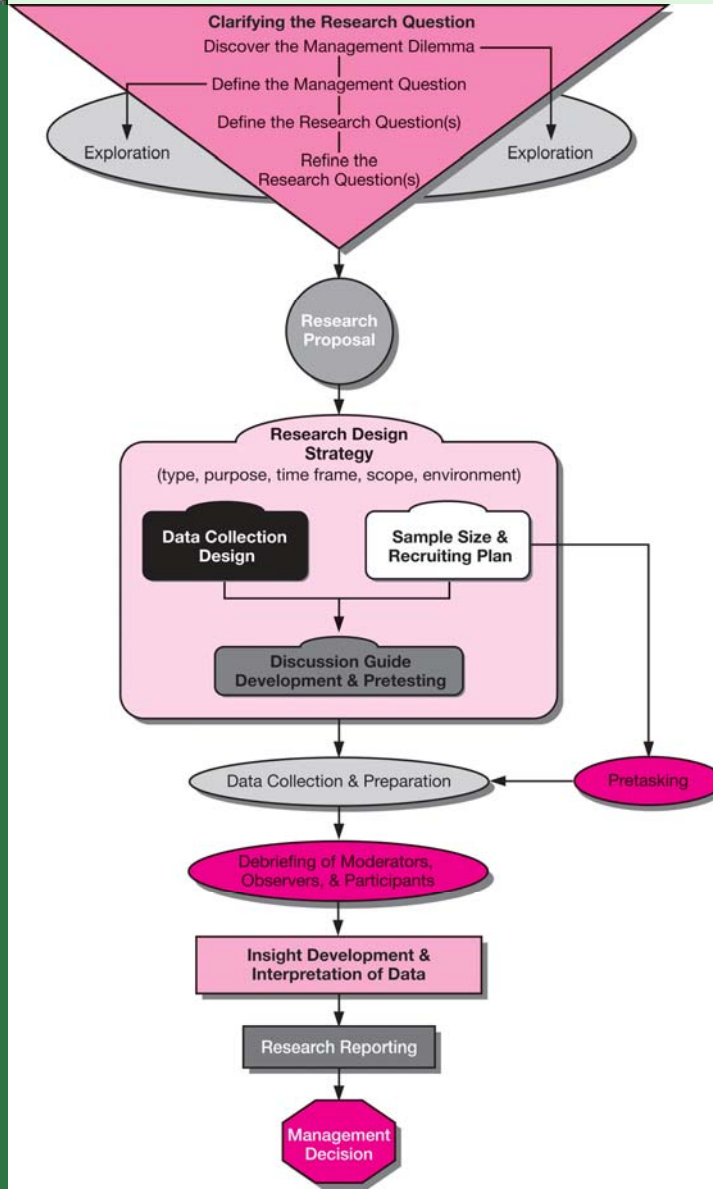


Emotion has Power

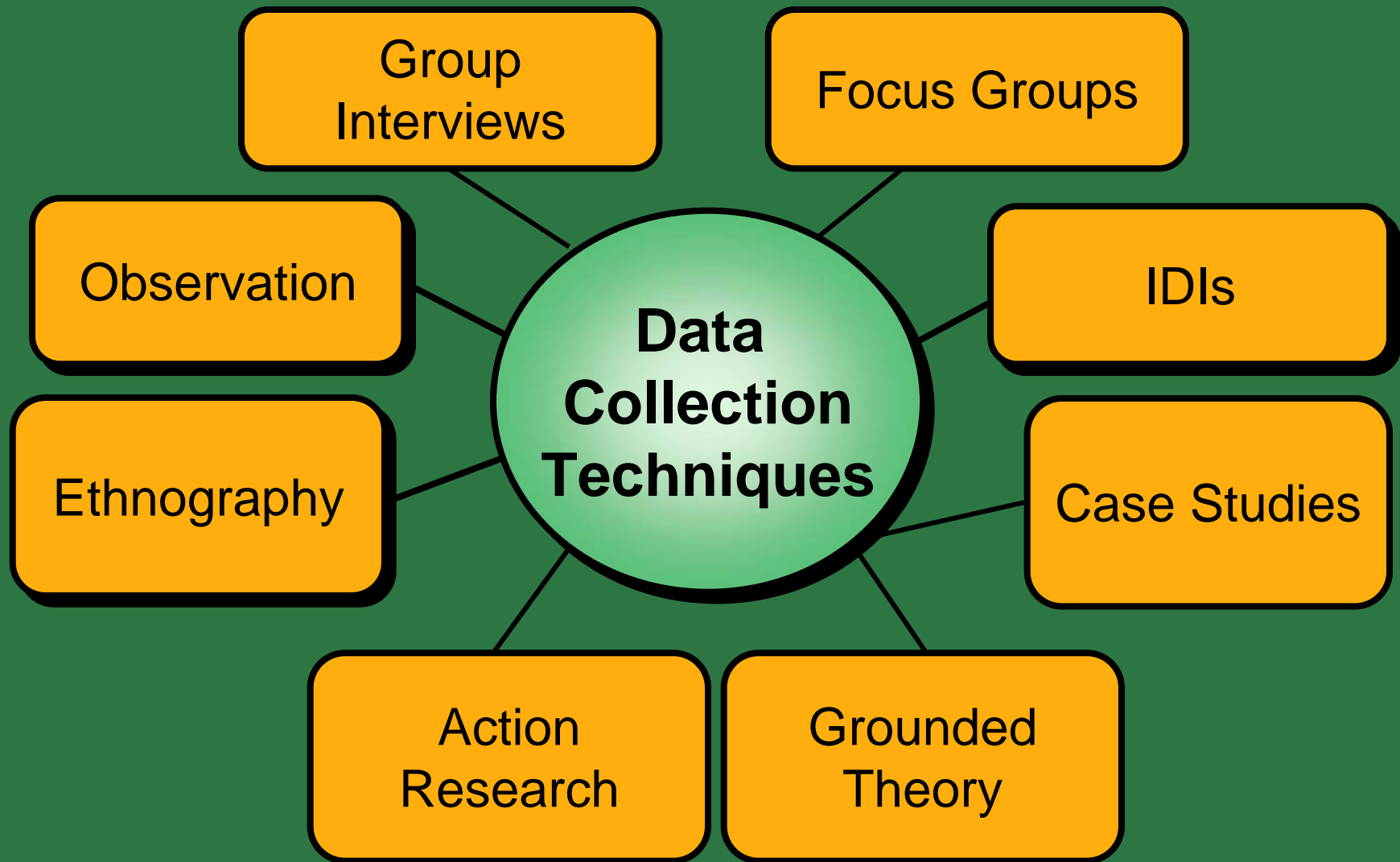
“We’re learning that emotion plays a key role in decisions that are very logical and shouldn’t have anything to do with emotion . . . If [researchers] are trying to make a connection . . . they have to understand how the brain works.”

*Justine Meaux,
BrightHouse Neurostrategies*

Qualitative Research and the Research Process



Qualitative Research



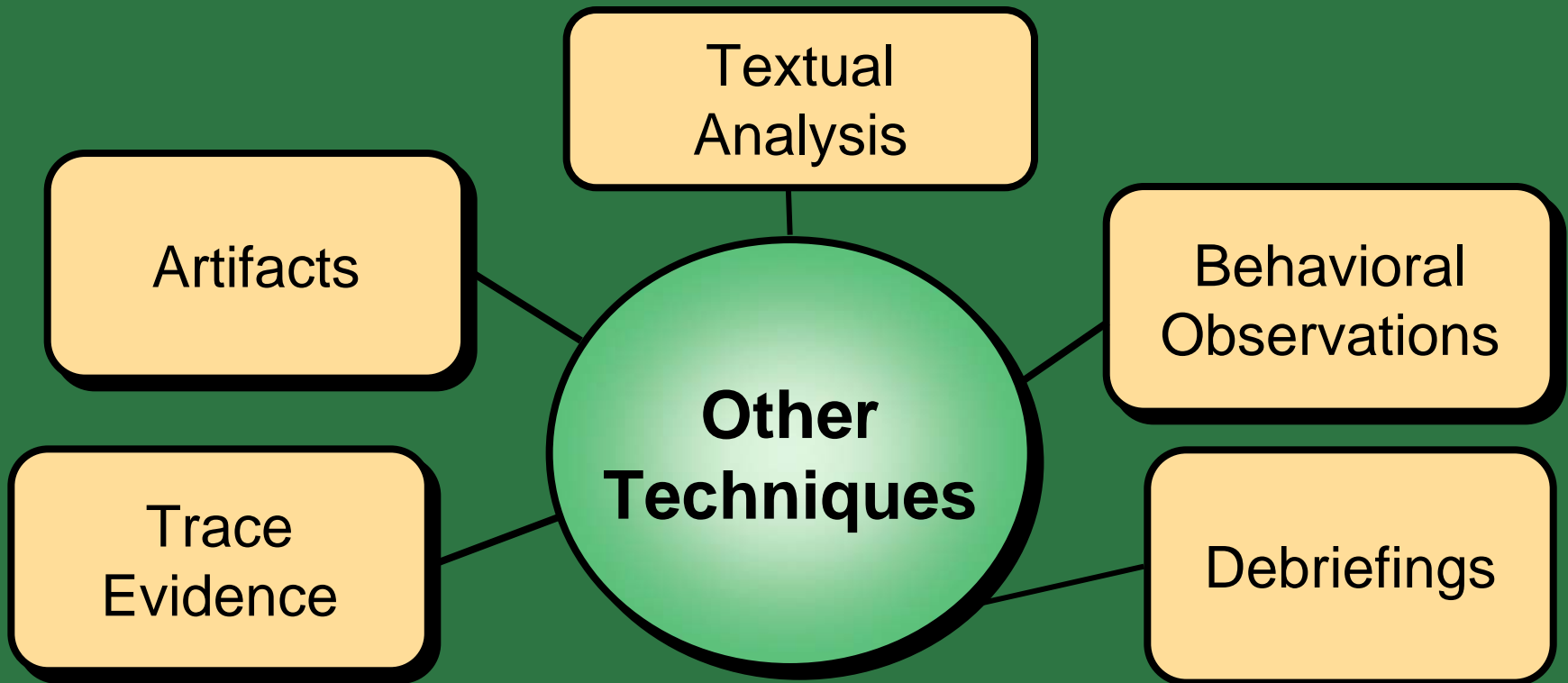



Why Use Qualitative Research?

“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

**Qualitative
Research**

Economics

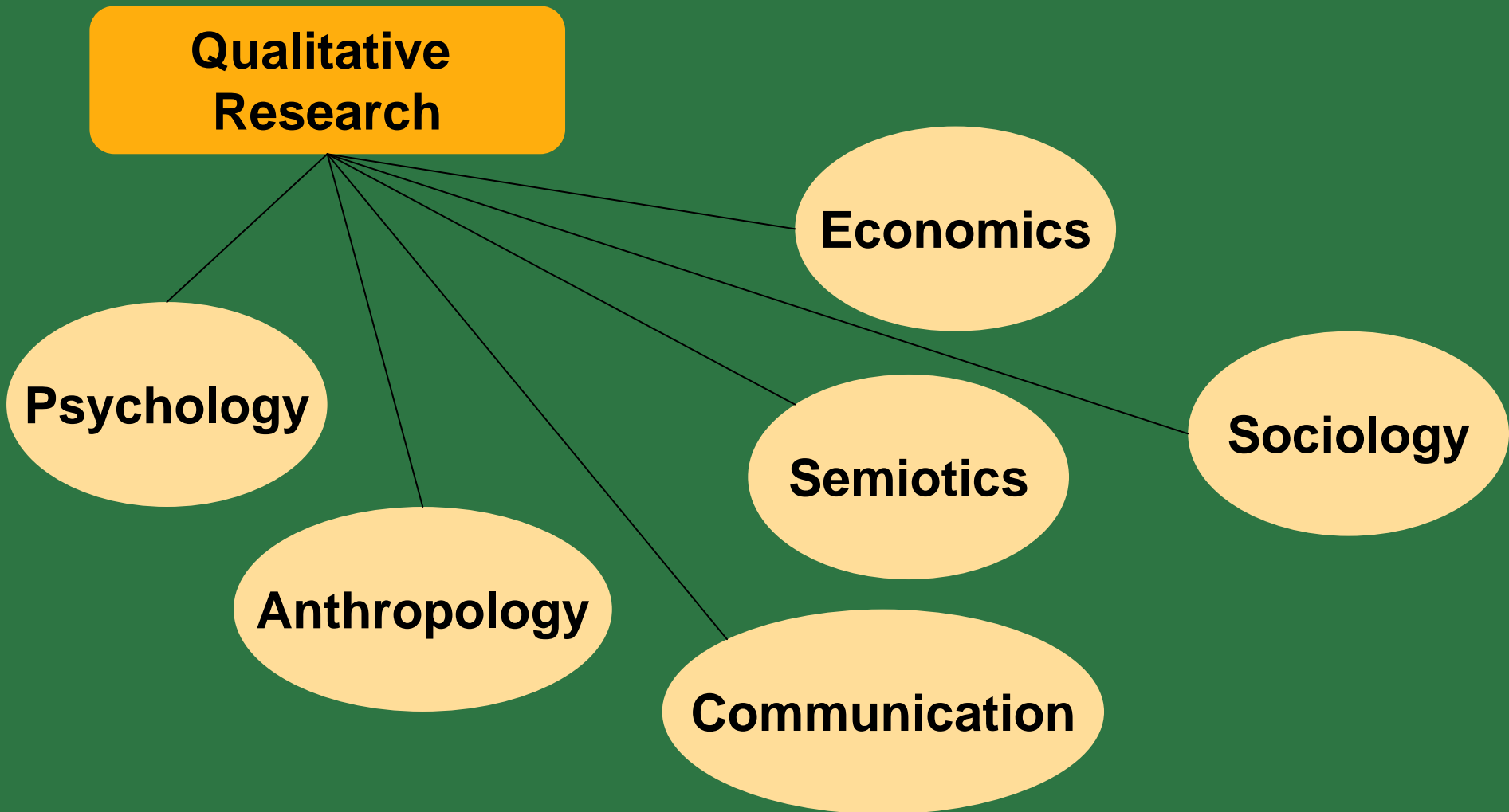
Psychology

Semiotics

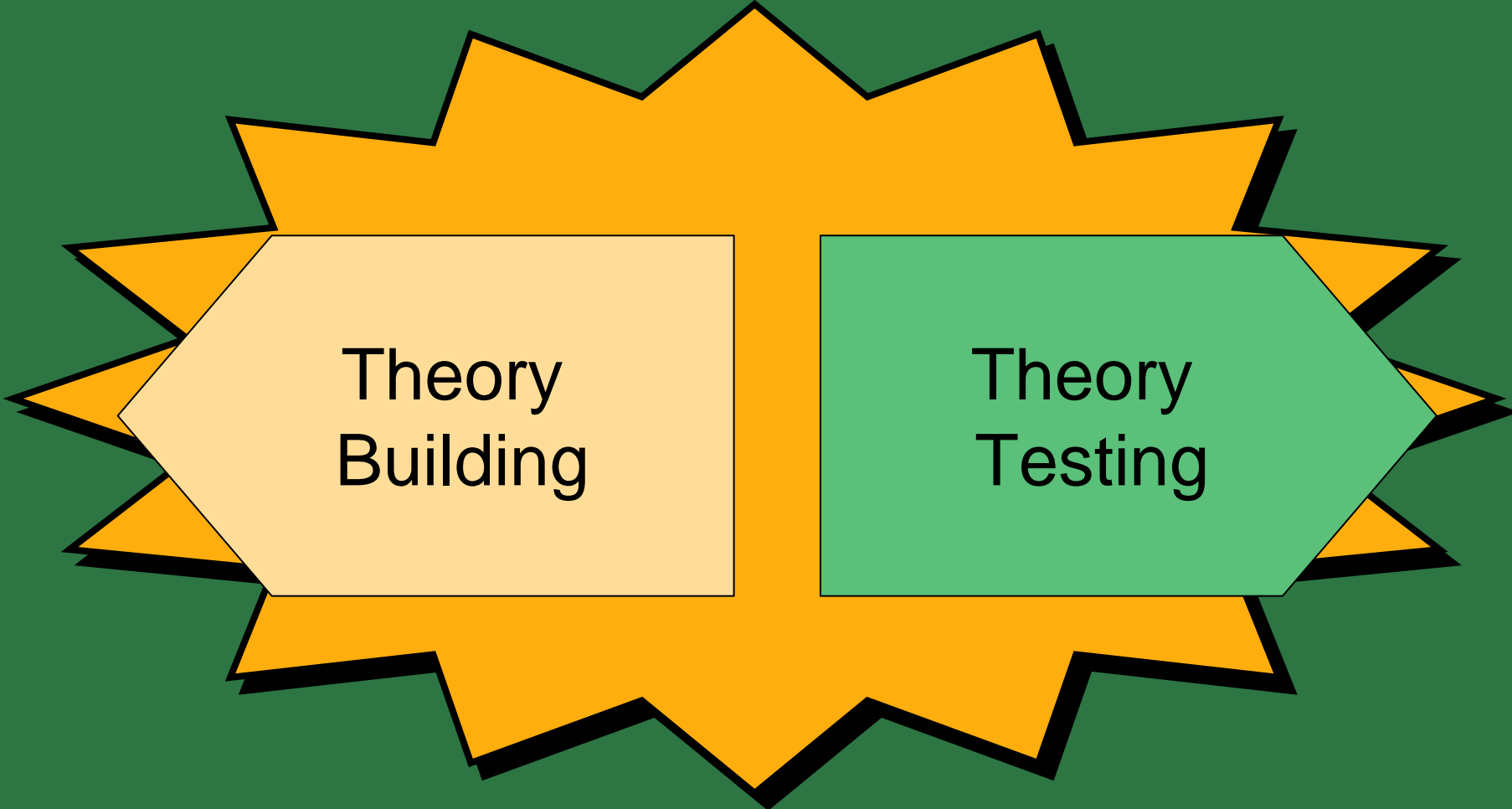
Sociology

Anthropology

Communication



Distinction between Qualitative & Quantitative



The diagram features a large, jagged orange starburst shape centered on a dark green background. Inside the starburst are two hexagonal boxes. The left box is light orange and contains the text 'Theory Building'. The right box is light green and contains the text 'Theory Testing'.

Theory
Building

Theory
Testing

Focus of Research



Qualitative

- Understanding
- Interpretation

Quantitative

- Description
- Explanation

Researcher Involvement



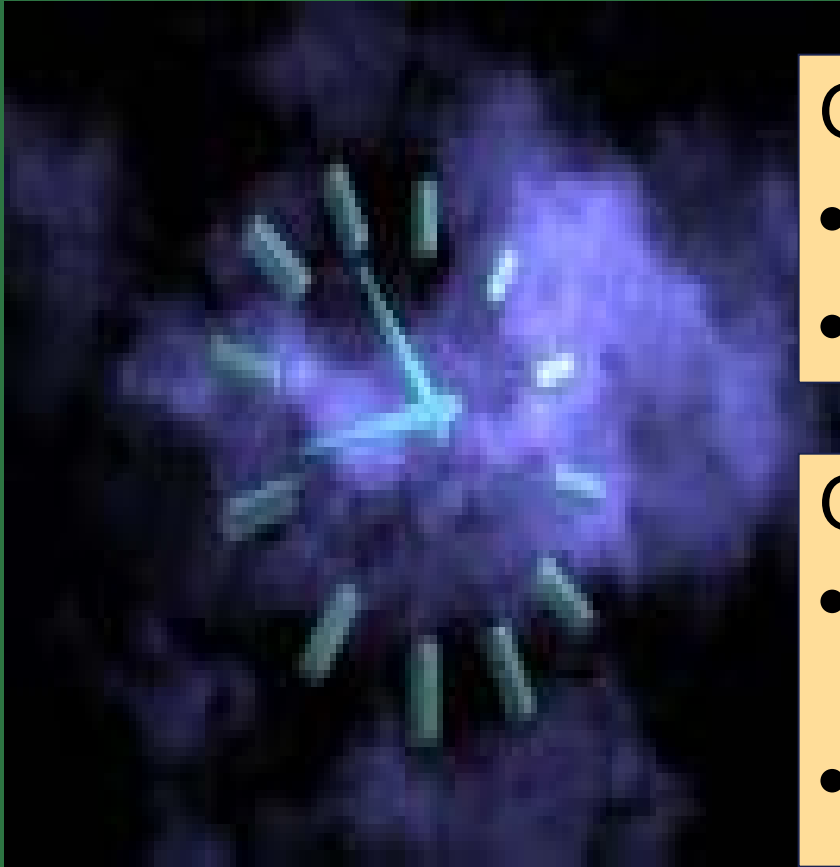
Qualitative

- 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 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-demand analysis to help determine optimal pricing.
- Target market references to improve advertising media focus.
- Tests of economic viability to predict your true 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 1-817-440-6168 or visit: www.decisionanalyst.com

Decision Analyst
The global leader in analytical research systems



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

800.220.0011 www.harrisinteractive.com Tel 877.919.4765
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Qualitative

- Verbal or pictorial
- Reduced to verbal codes

Quantitative

- Verbal descriptions
- Reduced to numeric codes

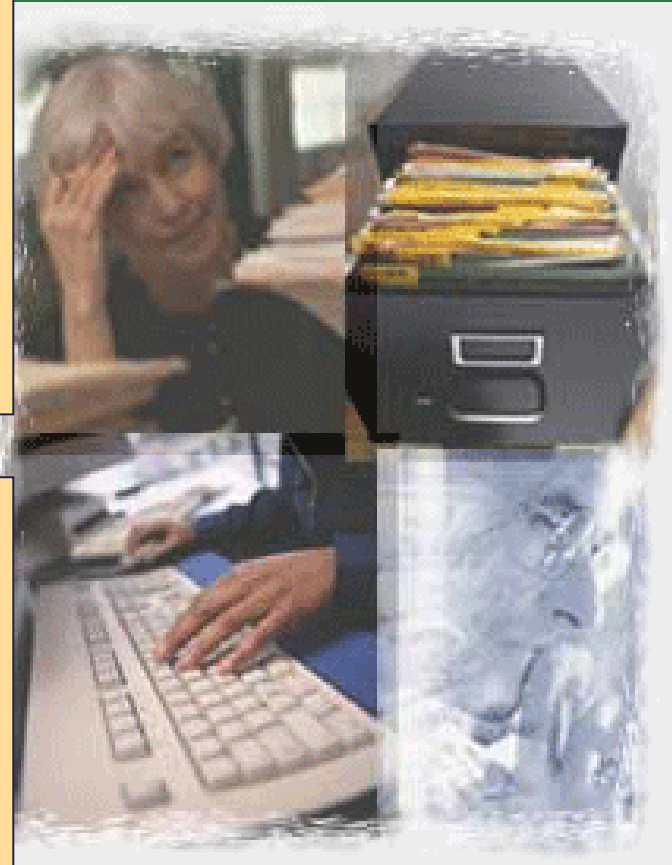
Turnaround

Qualitative

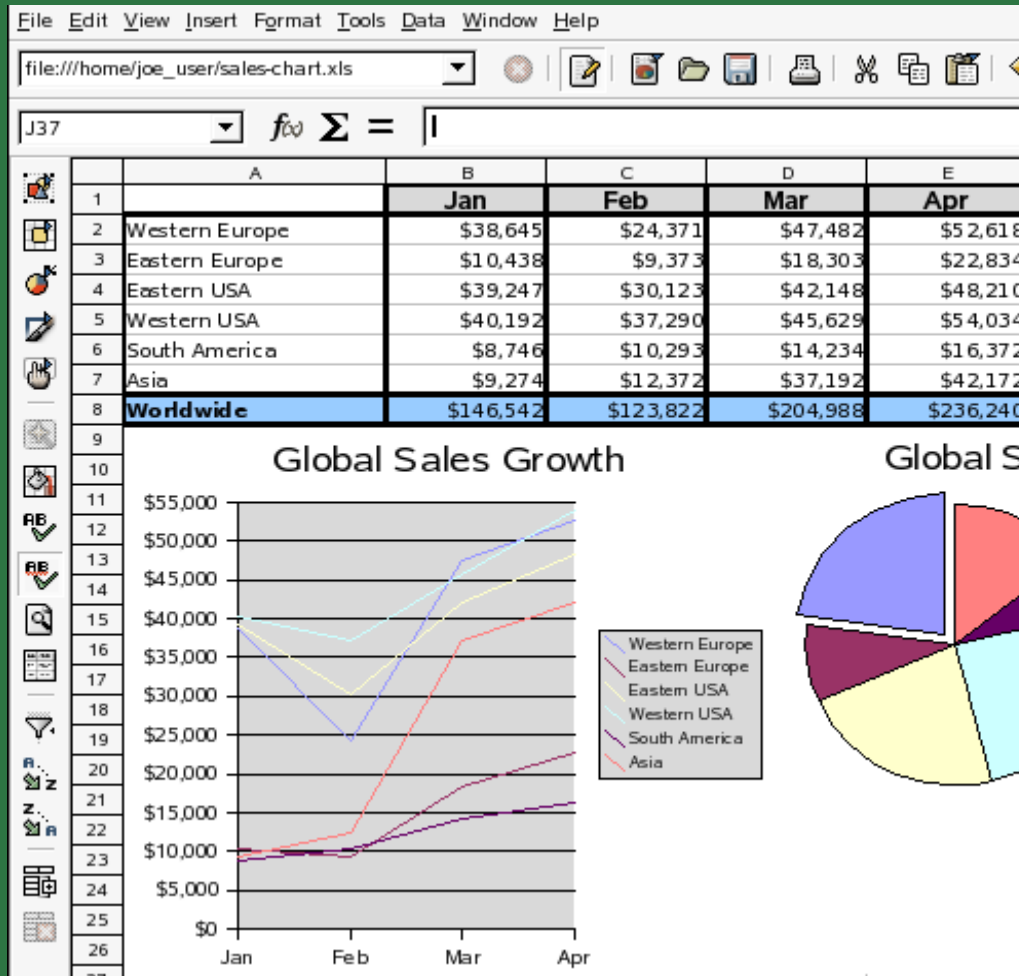
- Shorter turnaround possible
- Insight development ongoing

Quantitative

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



Data Analysis



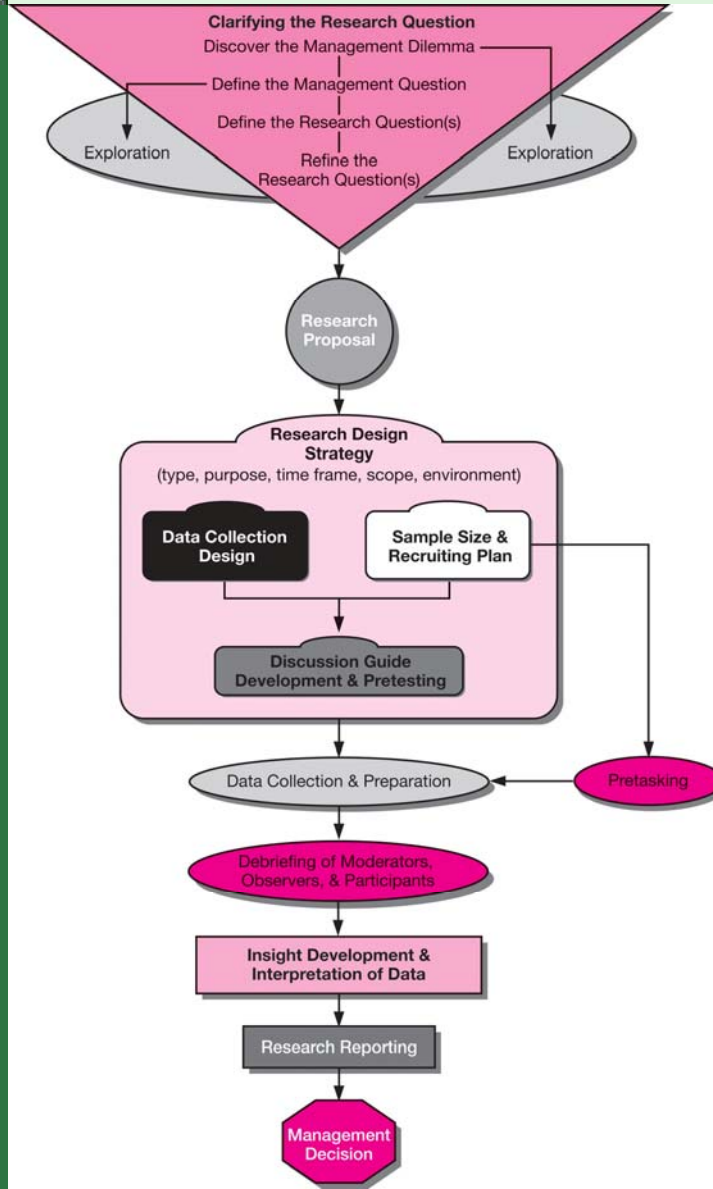
Qualitative

- 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

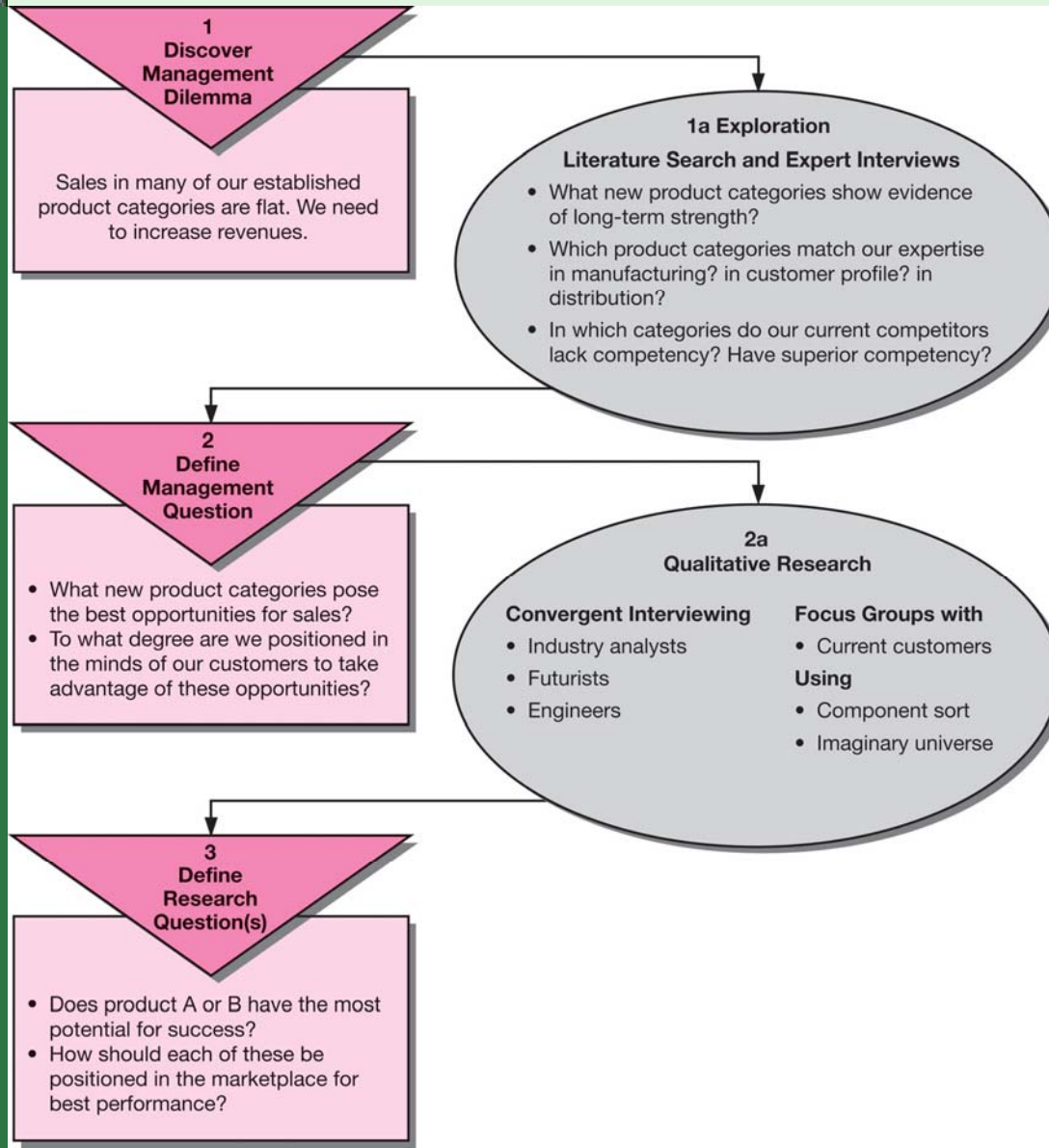
Create collage

Keep diaries

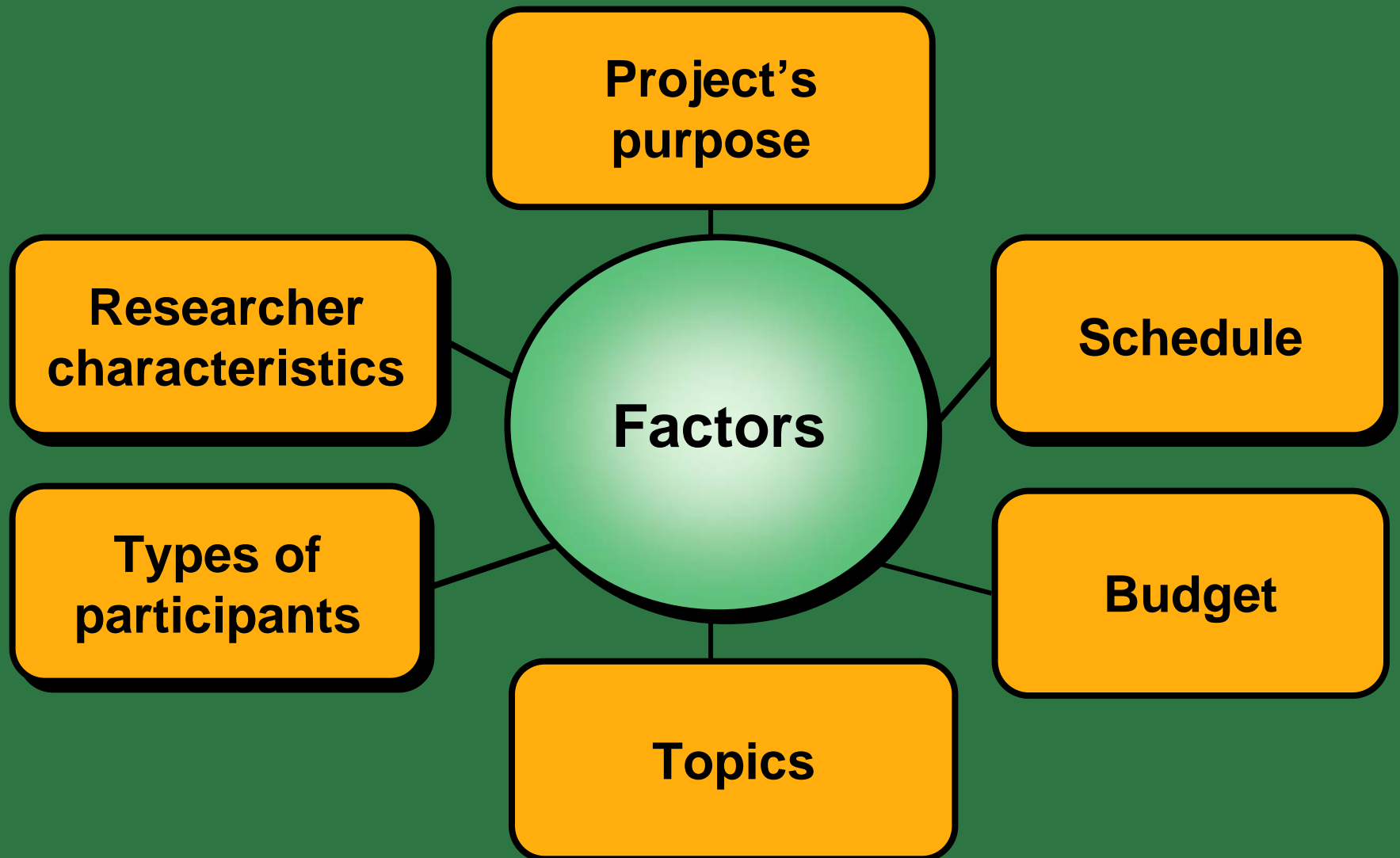
Draw pictures

Construct a story

Formulating the Qualitative Research Question



Choosing a Qualitative Method




NonProbability Sampling

**Purposive
Sampling**

**Snowball
Sampling**

**Convenience
Sampling**

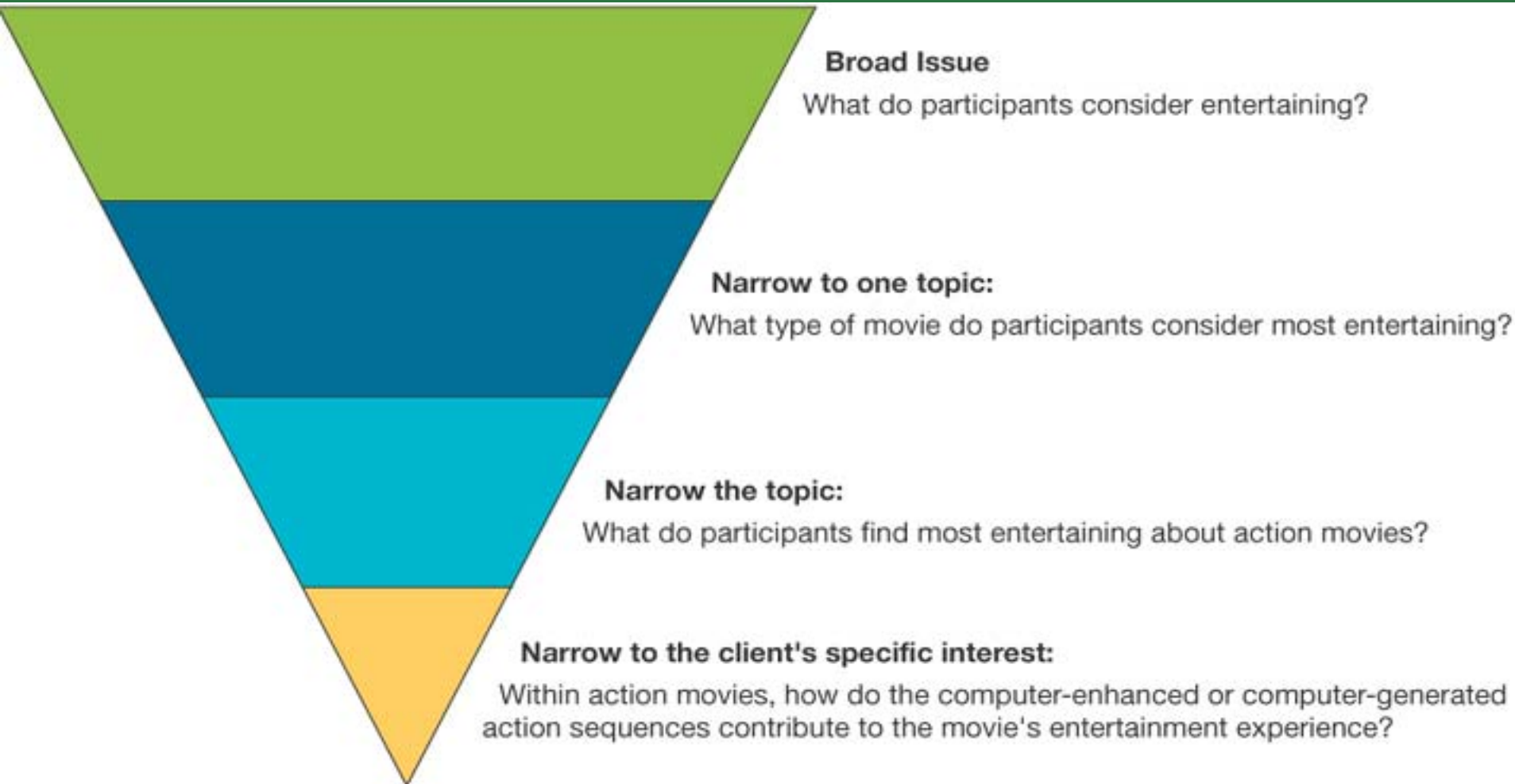


Qualitative Sampling

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

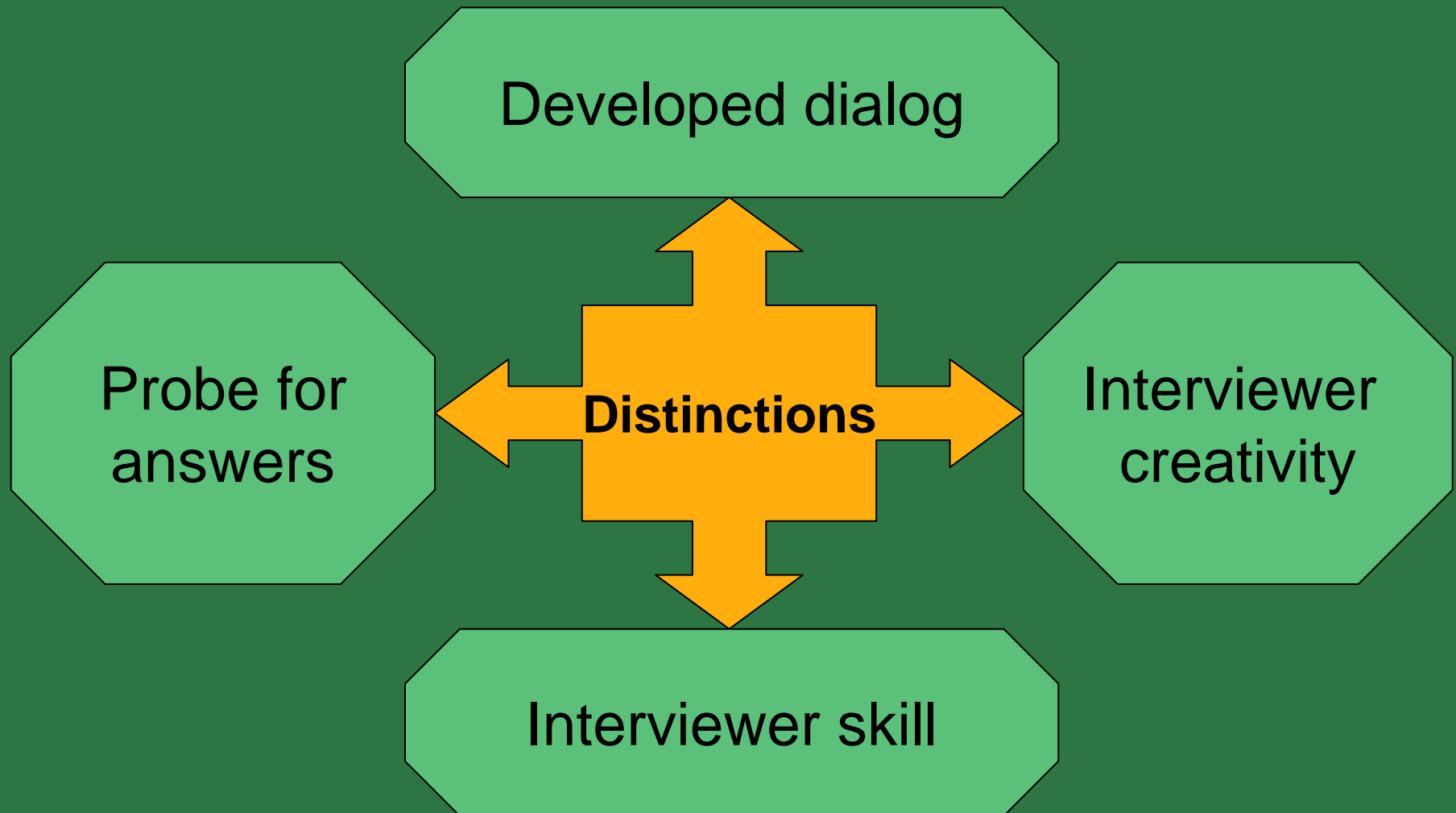
Unstructured

Semi-structured

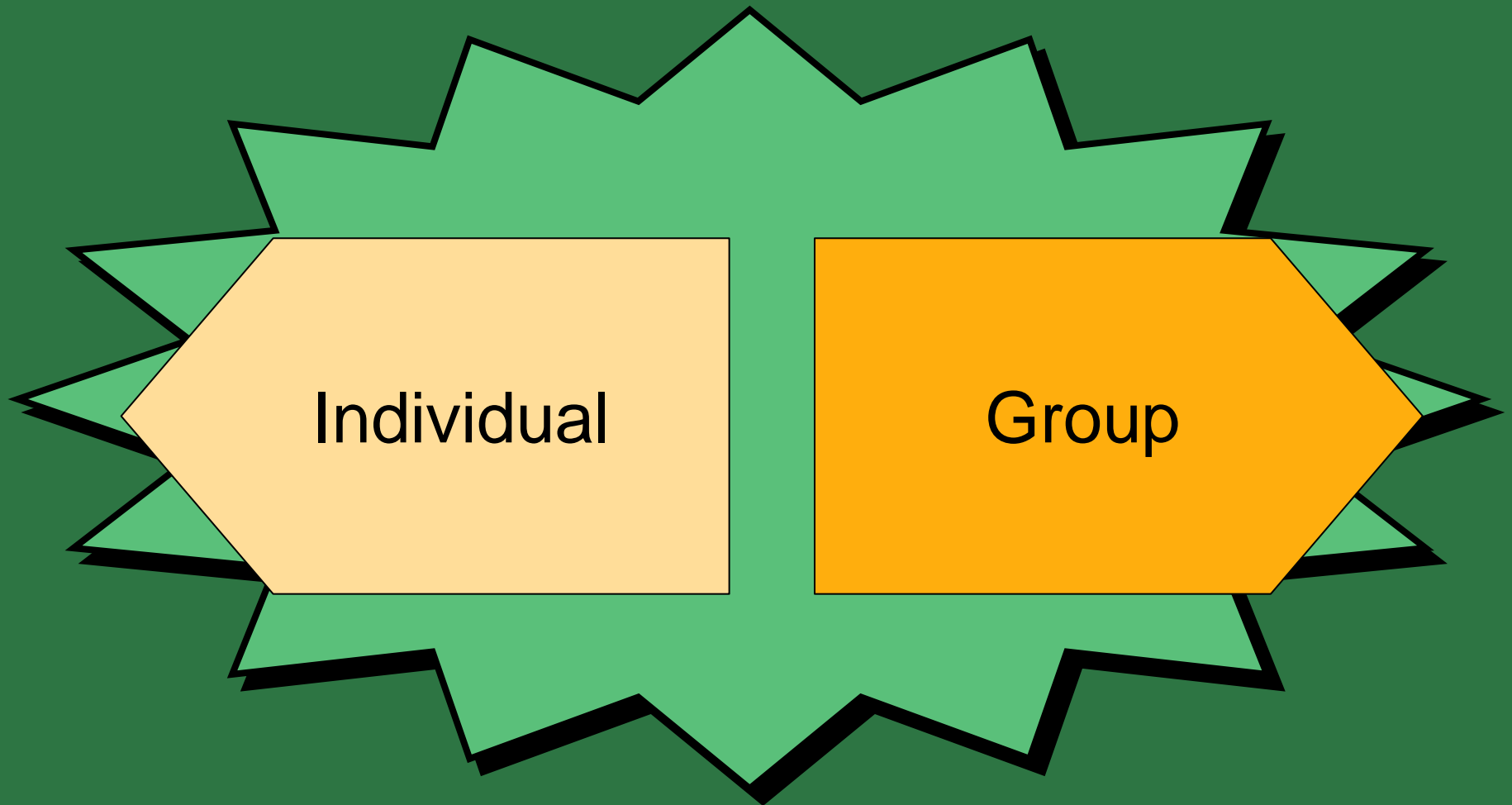
Structured



Requirements for Unstructured Interviews



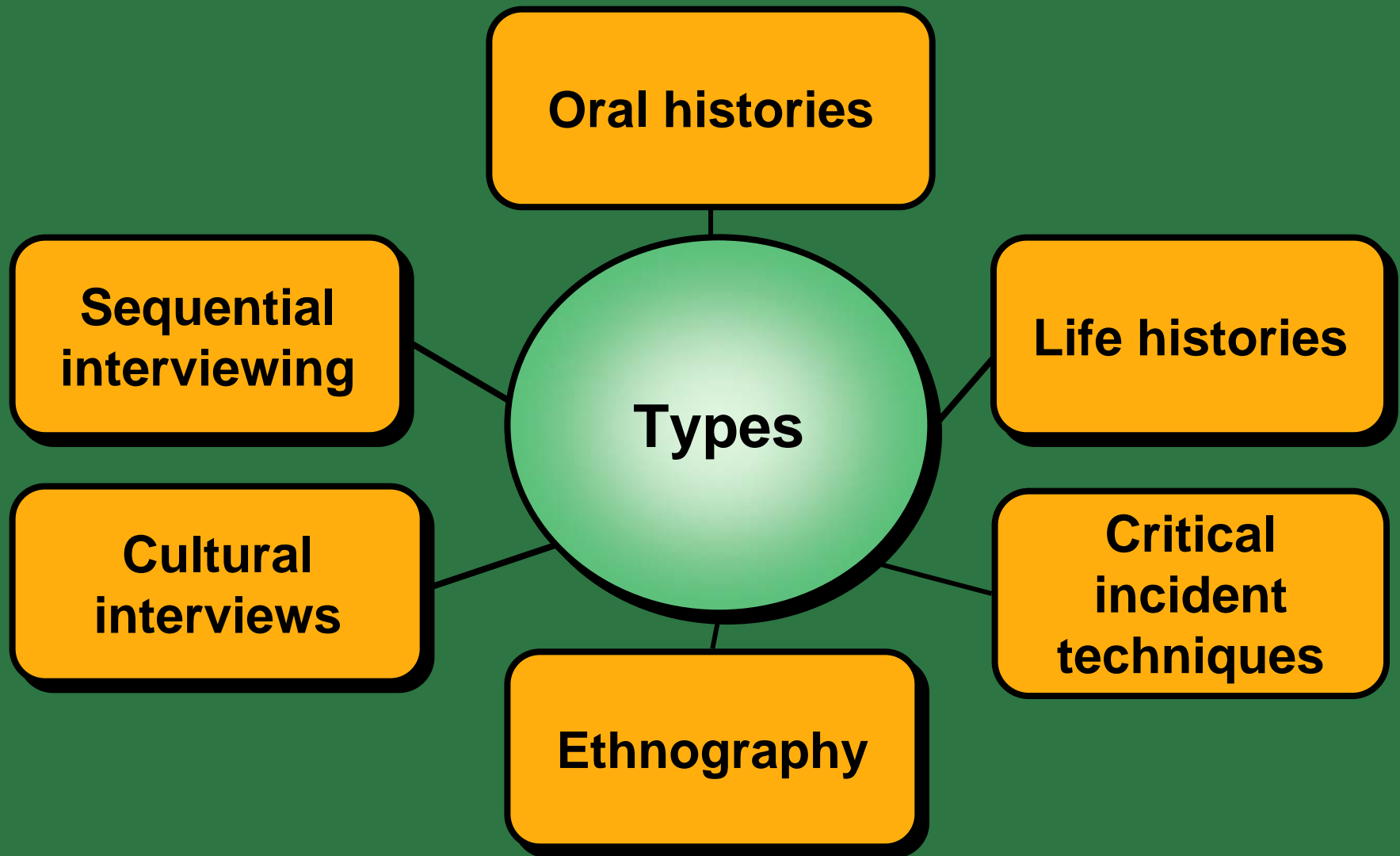
The Interview Mode



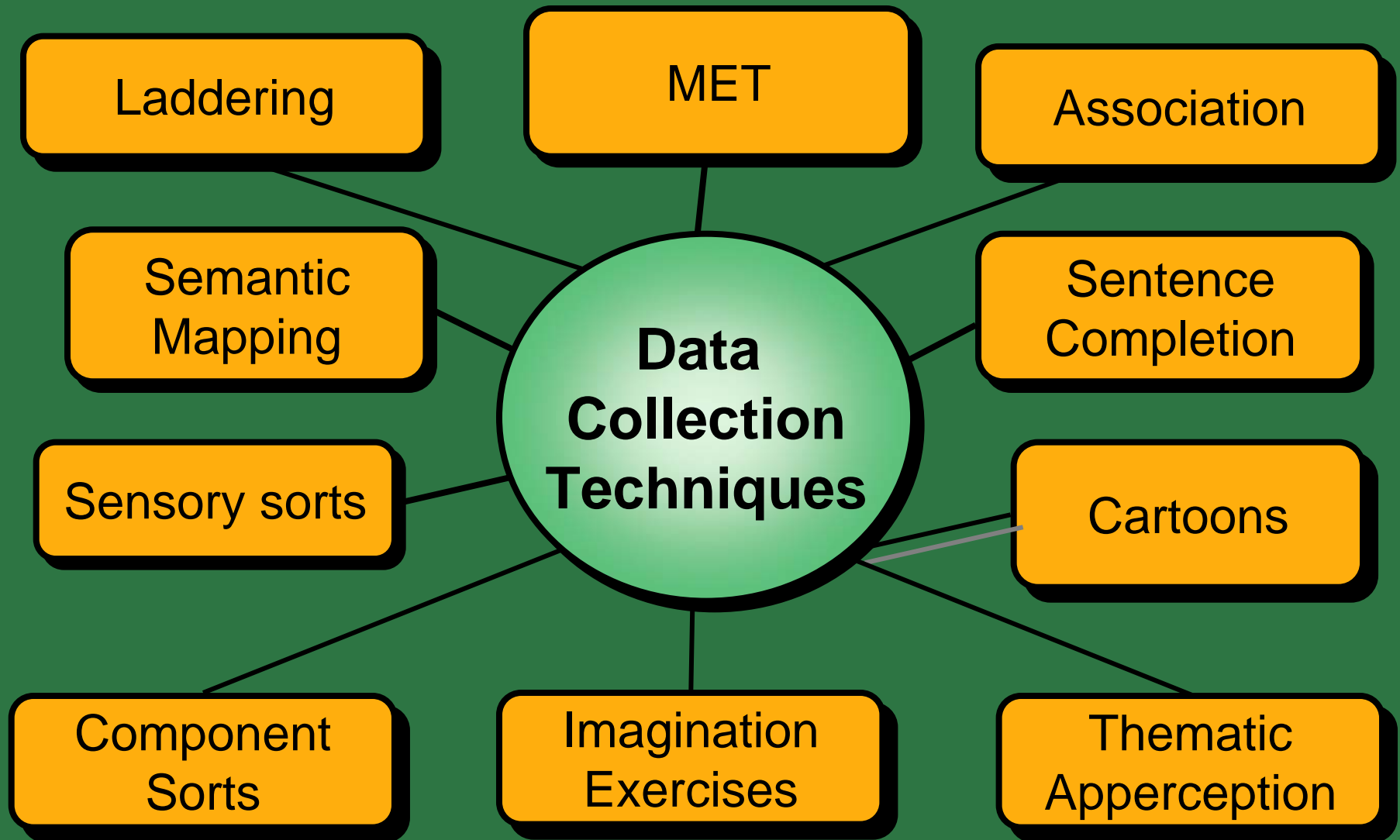
IDI vs Group

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



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 displays the FocusVision VideoMarker software interface. The top-left panel shows metadata: Location (FocusVision Worldwide, Inc., Stamford CT), Date (7/11/2005), Client (Client Demonstration), and Topic (VideoMarker Demo). The main window features a video player on the left showing a group of people in a meeting room. Below the video is a playback control bar with a progress slider and buttons for play, stop, and volume. To the right of the video is a list of clips with timestamps, each preceded by a microphone icon and a green play button. The clips are: 'Always forget to bring coupons' (00:10), 'New safety cap design' (00:10), 'Generic brand is better value' (00:10), and 'Close-up on easel' (00:10). Above the clip list is a red 'VideoMark!' button and a prompt to 'Click the VideoMark button to create a new clip'. Below the clip list is a prompt to 'Click ► to play VideoMark or ► to create a clip'. At the bottom of the interface are three buttons: 'Technical Support', 'Review/Email/Export Clips', and 'Help'. The version number 'ver. 1.0.0' is displayed in the bottom right corner.

FocusVision VideoMarker

Location: FocusVision Worldwide, Inc., Stamford CT
Date: 7/11/2005
Client: Client Demonstration
Topic: VideoMarker Demo

Click the VideoMark button to create a new clip

VideoMark!

Click ► to play VideoMark or ► to create a clip

Always forget to bring coupons 00:10
New safety cap design 00:10
Generic brand is better value 00:10
Close-up on easel 00:10

Clip: vmarkdemo 01:27

Technical Support

Review/Email/Export Clips

Help

ver. 1.0.0

Face-to-Face

Telephone

Online

Videoconference


Combining Qualitative Methodologies



Case Study

The diagram features a dark green background. In the center is a light green starburst shape with a black outline. Inside this starburst are two overlapping hexagonal shapes. The left hexagon is light orange and contains the text 'Case Study'. The right hexagon is a darker orange and contains the text 'Action Research'. The two hexagons overlap in the middle, with the 'Action Research' hexagon slightly behind the 'Case Study' one.

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

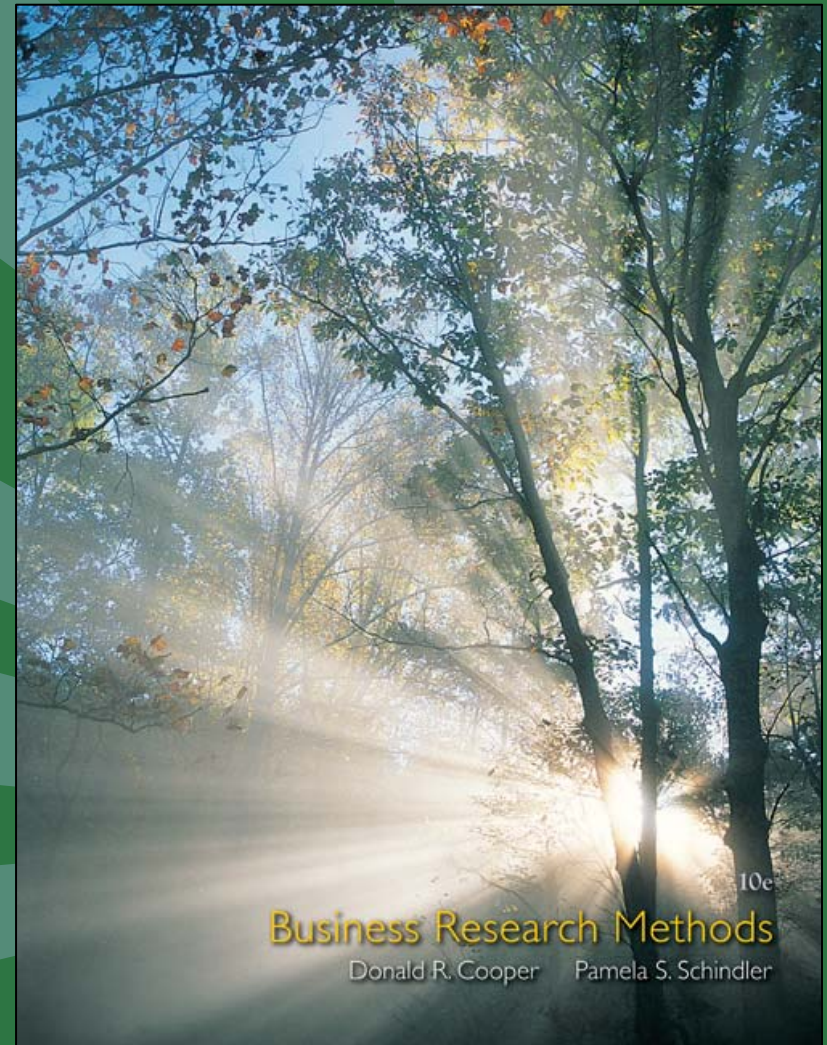



Key Terms (cont.)

- 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

101

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

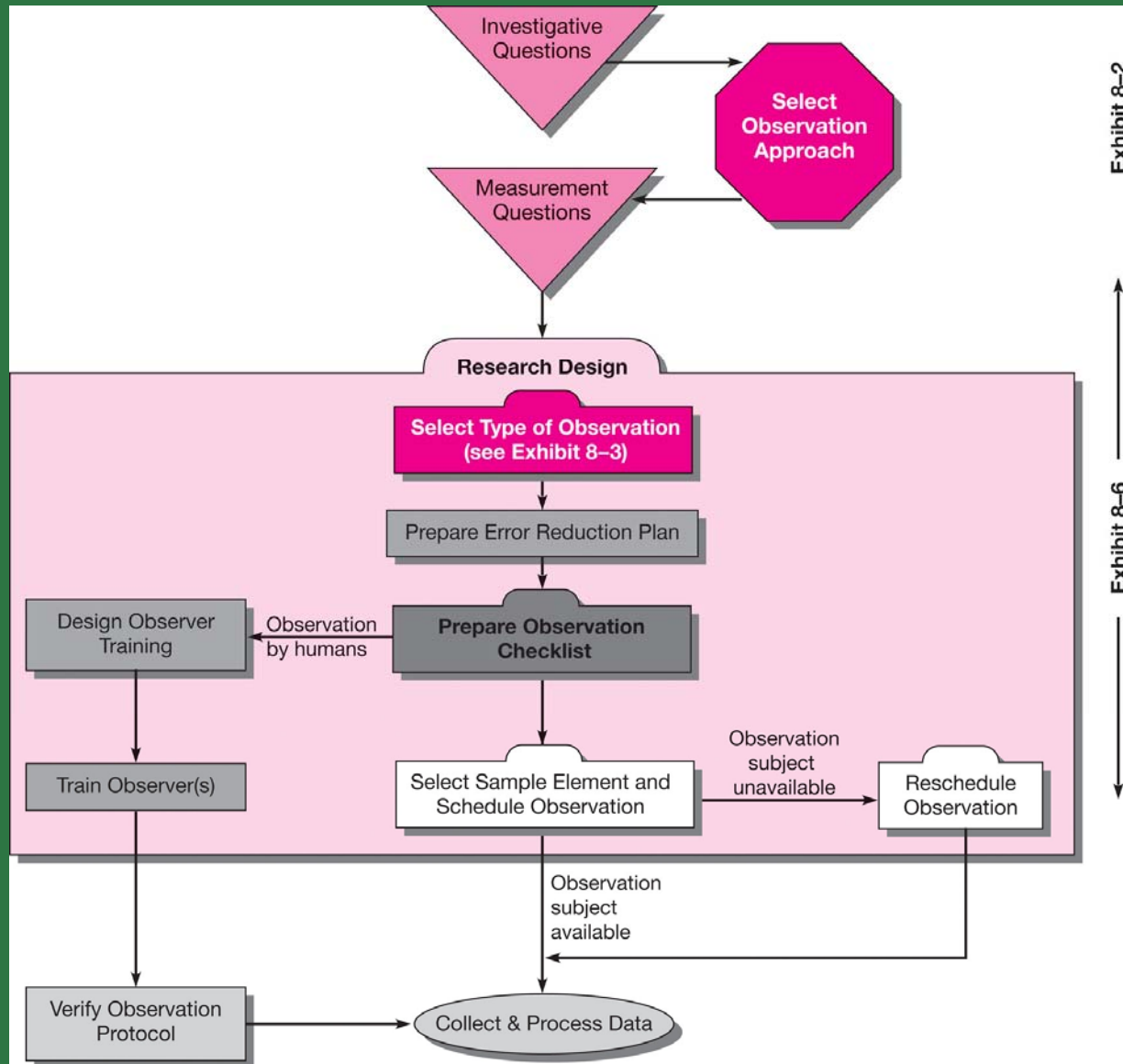


RFID Changes Monitoring

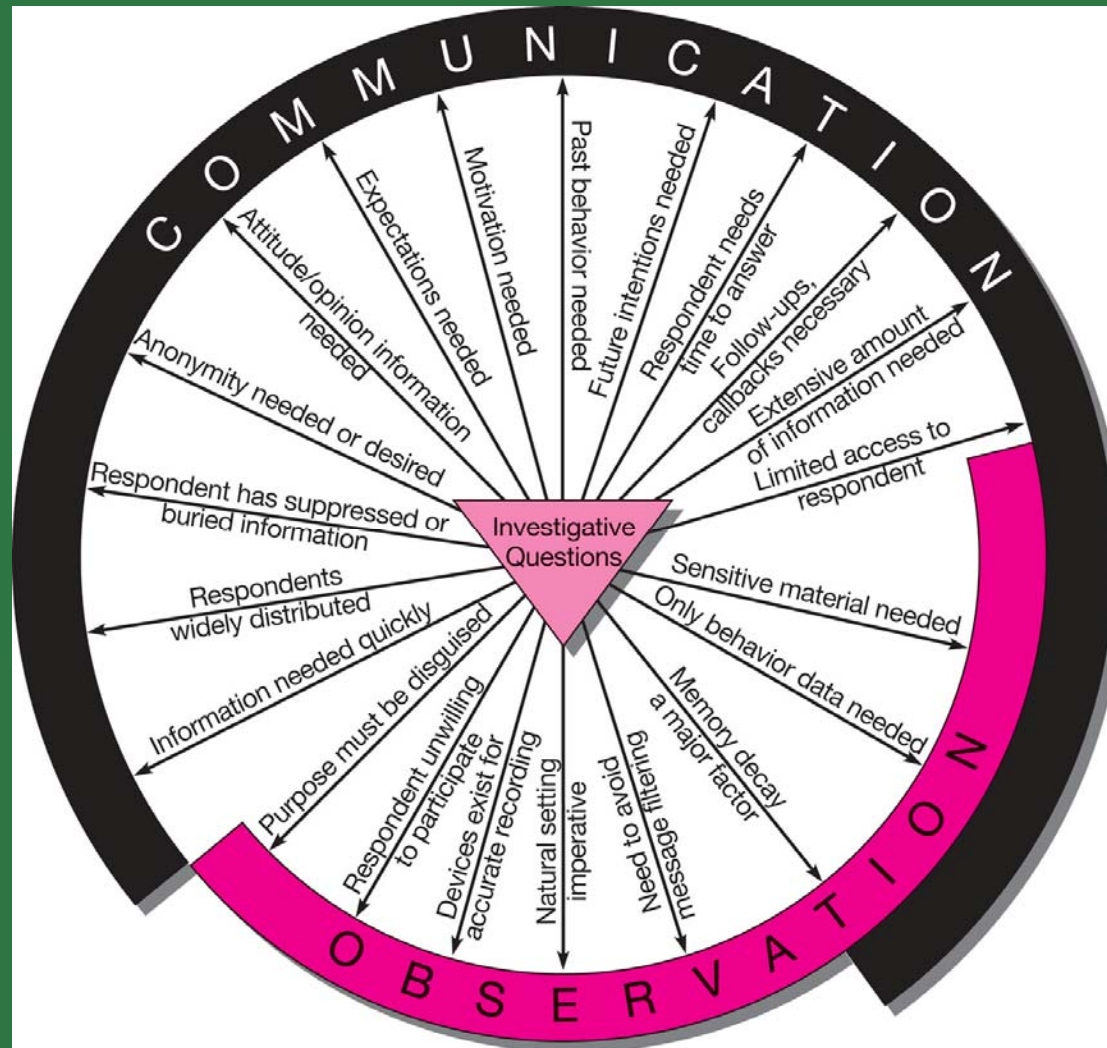
“We can certainly understand and appreciate consumer concern about privacy. That’s why we want our customers to know that RFID tags will not contain nor collect any additional data about our customers. In fact in the foreseeable future, there won’t even be any RFID readers on our stores’ main sales floors.”

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

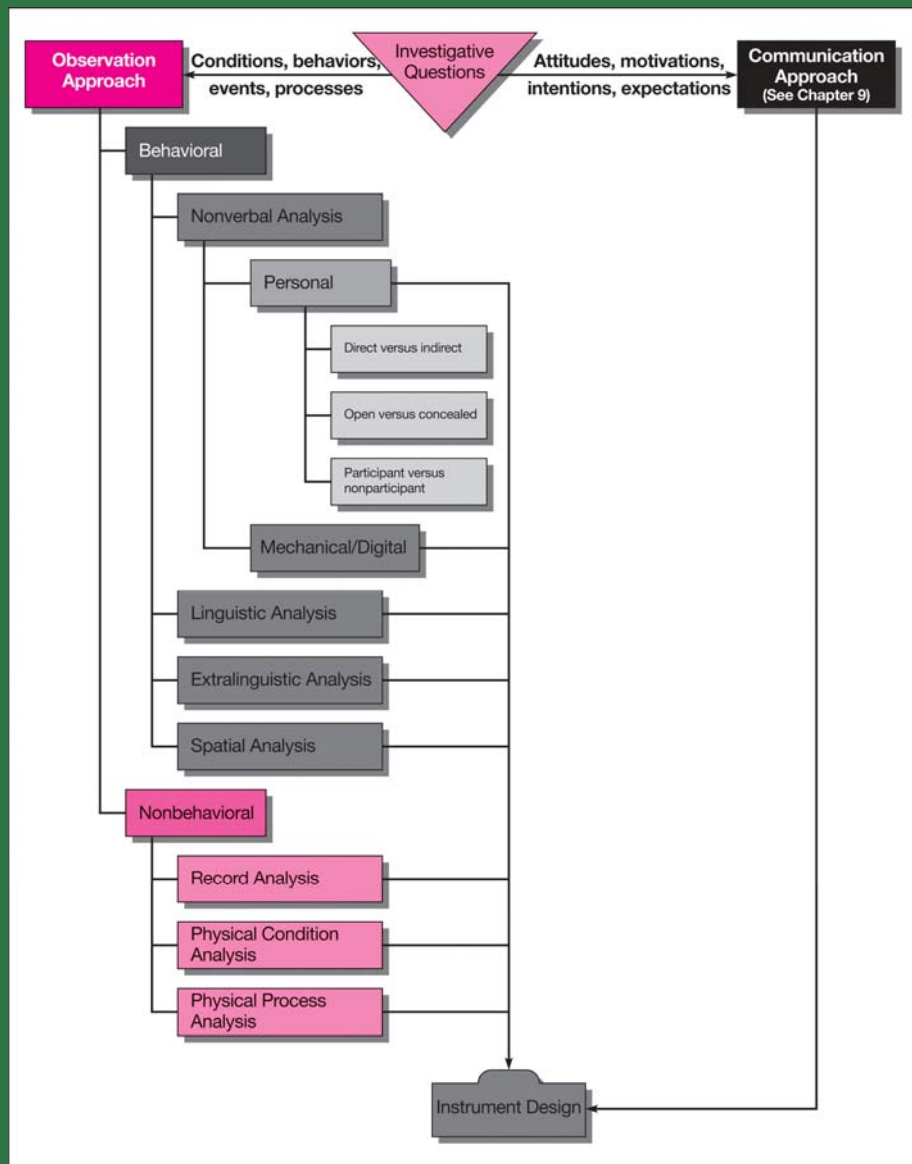
Observation and the Research Process



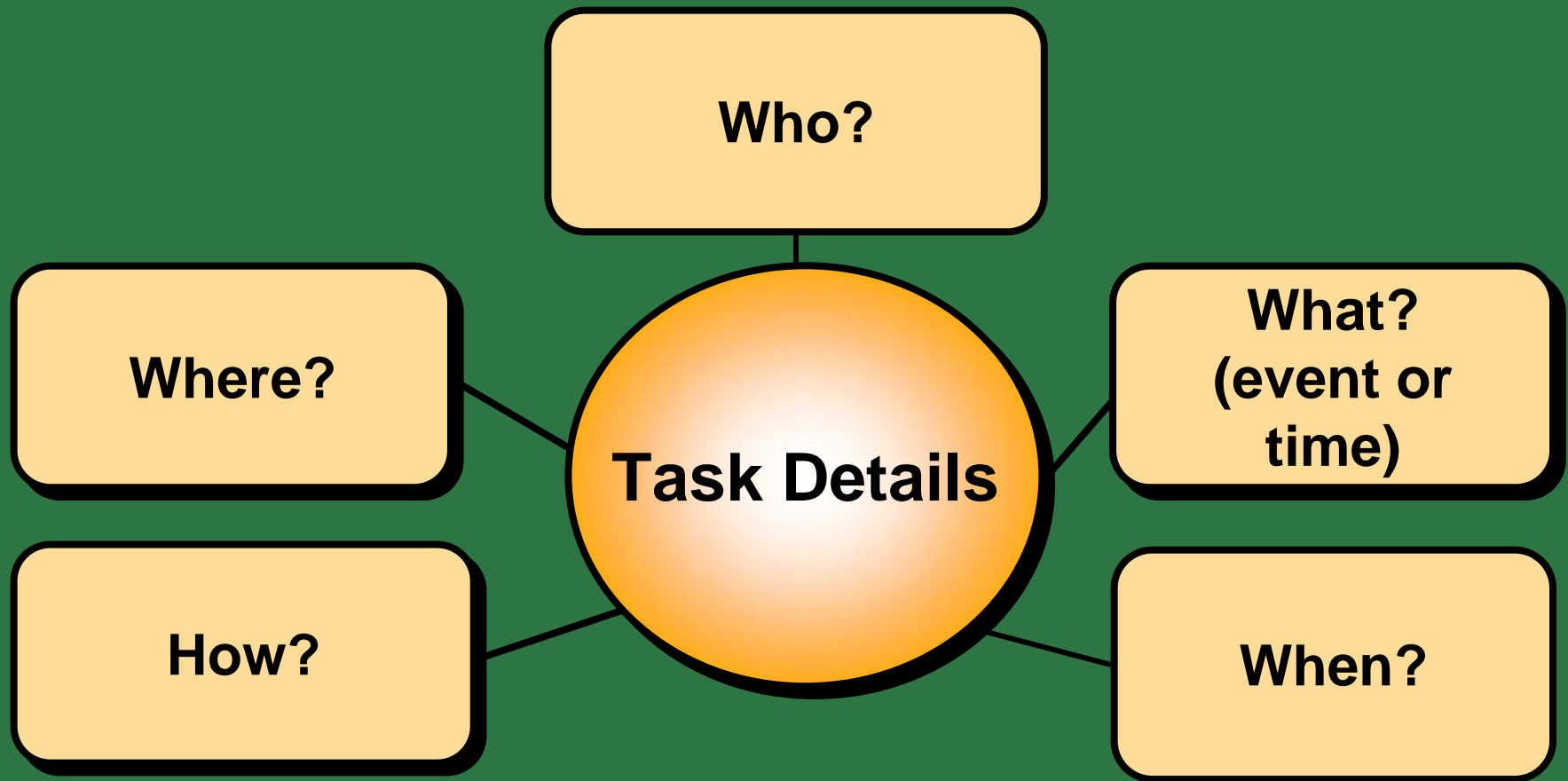
Selecting the Data Collection Method



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

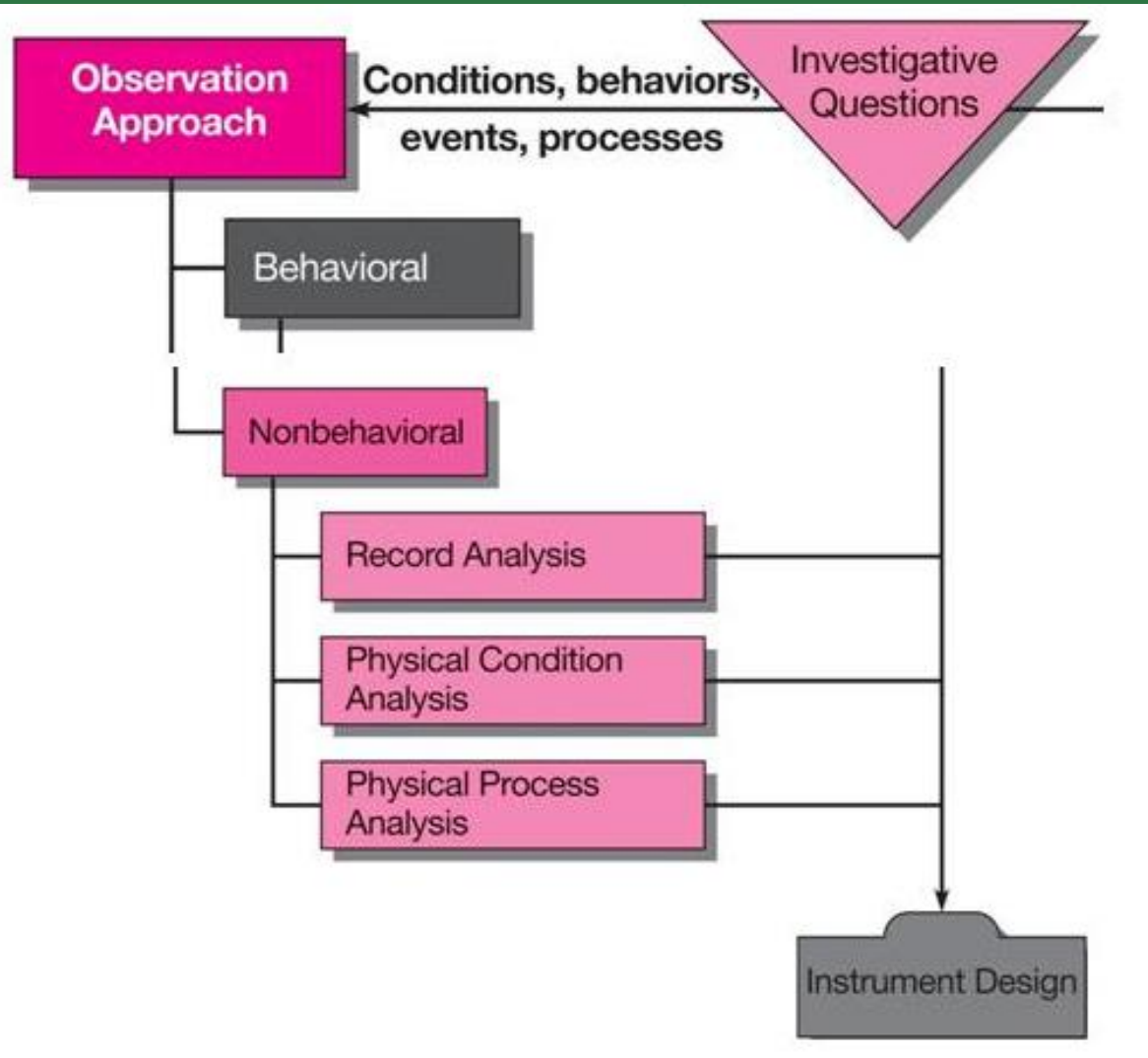
Nonbehavioral

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

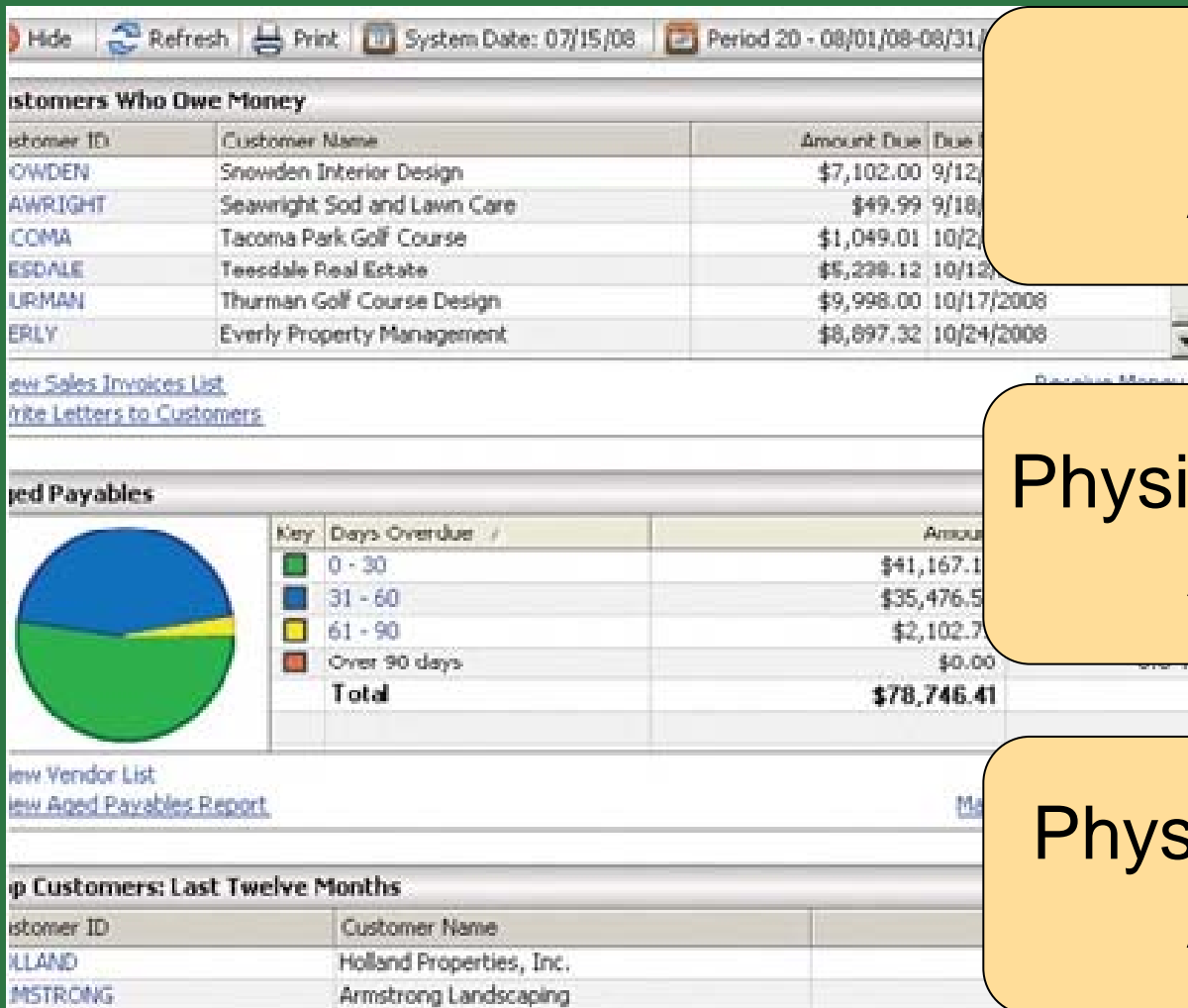
Behavioral

- Nonverbal
- Linguistic
- Extralinguistic
- Spatial

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



Nonbehavioral Observation



Record
Analysis

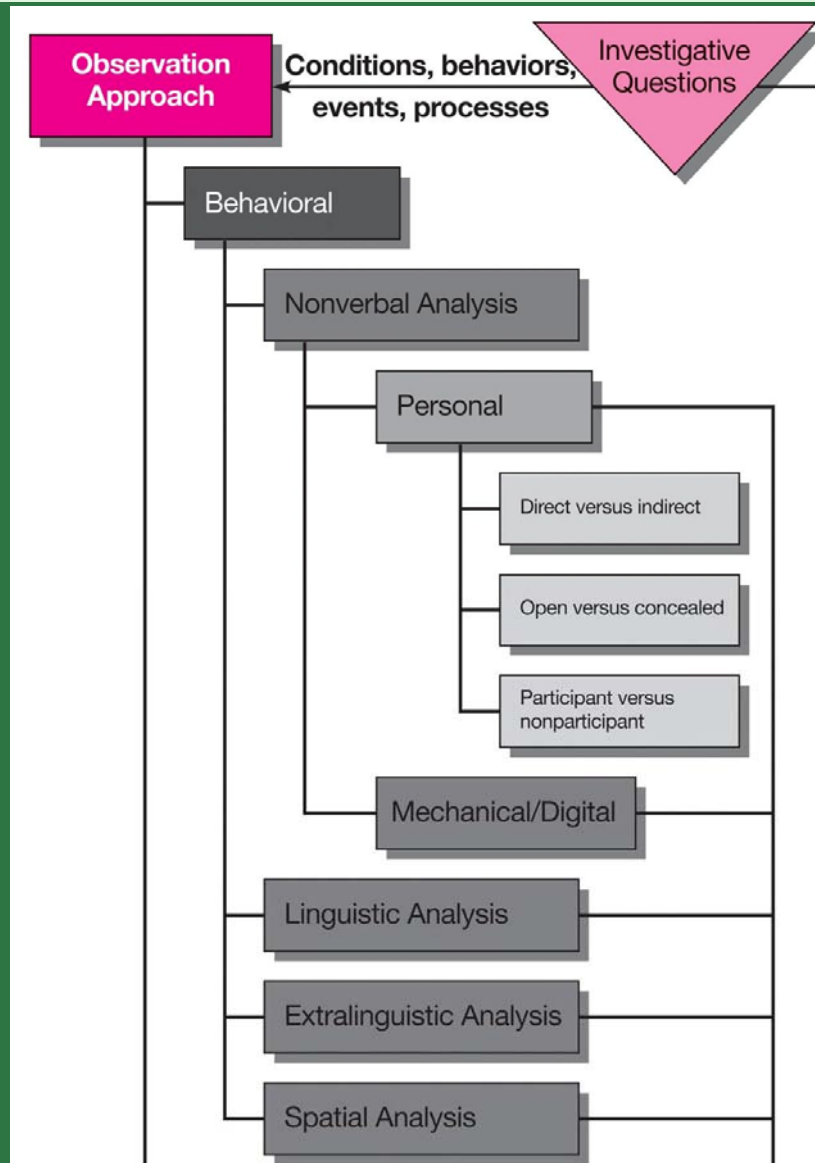
Physical Condition
Analysis

Physical Process
Analysis

Wal-Mart Implements Use of RFID Labels



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

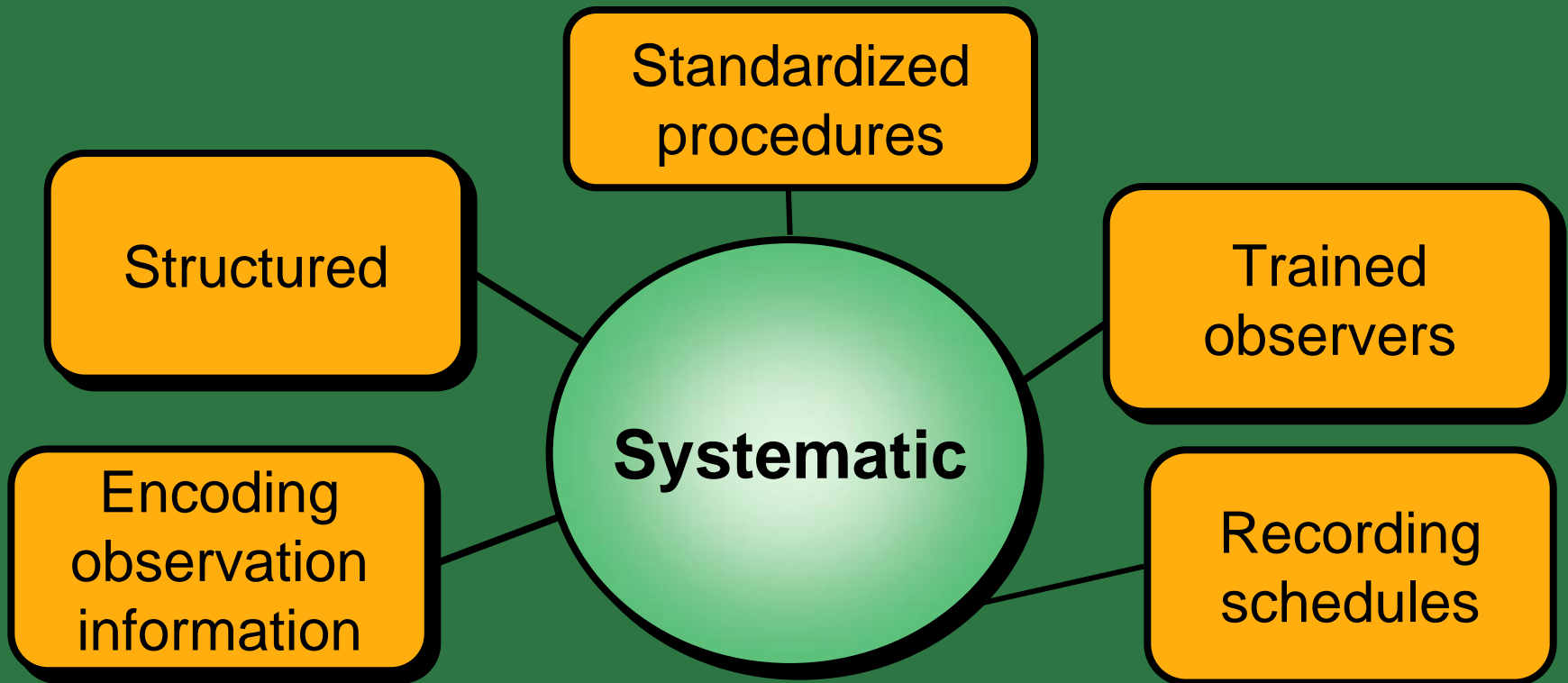


Behavioral Observation

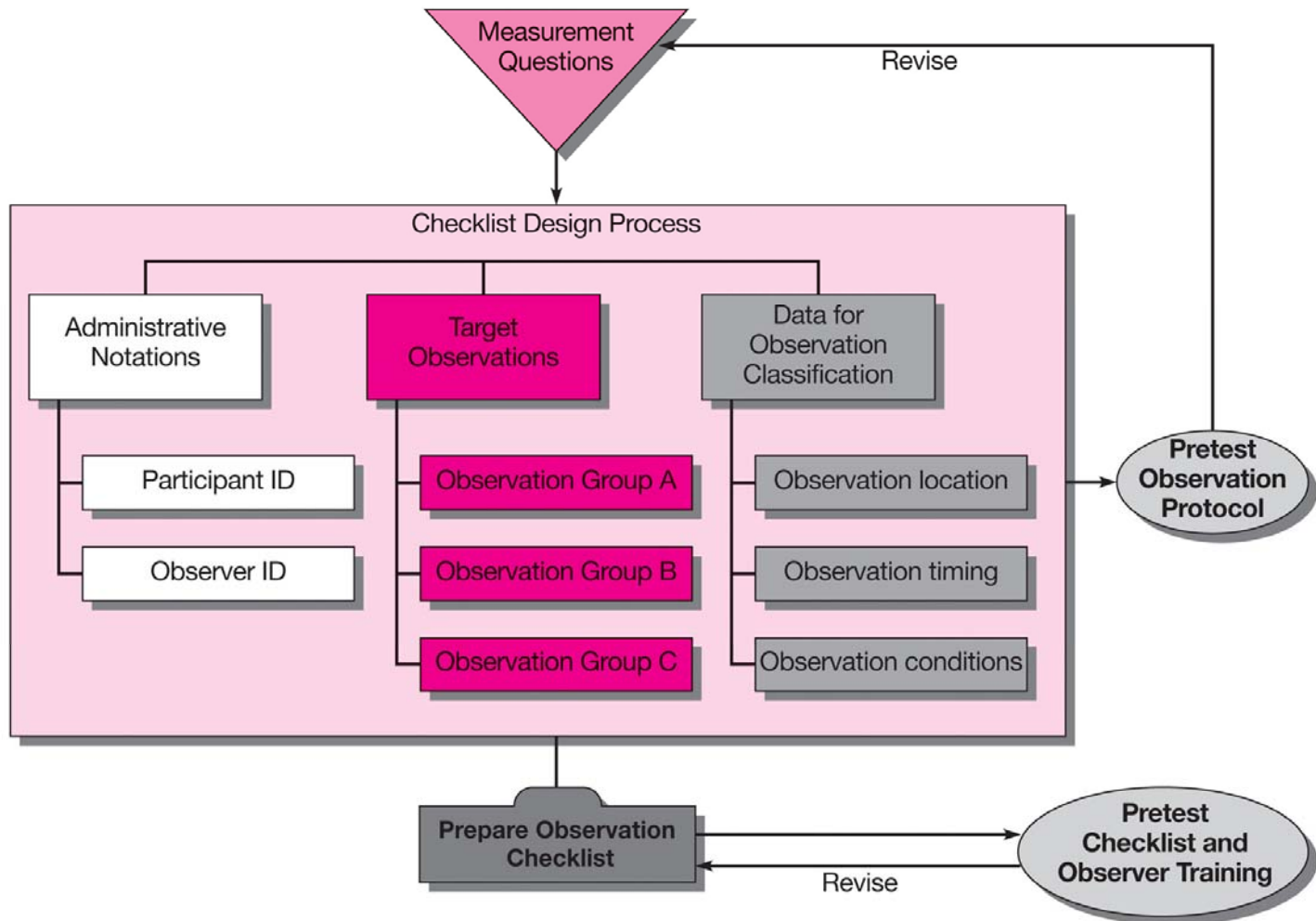
- “We noticed people scraping the toppings off our pizza crusts. We thought at first there was something wrong, but they said, ‘We love it, we just don’t eat the crust anymore.’”
 - Tom Santor, Donatos Pizza



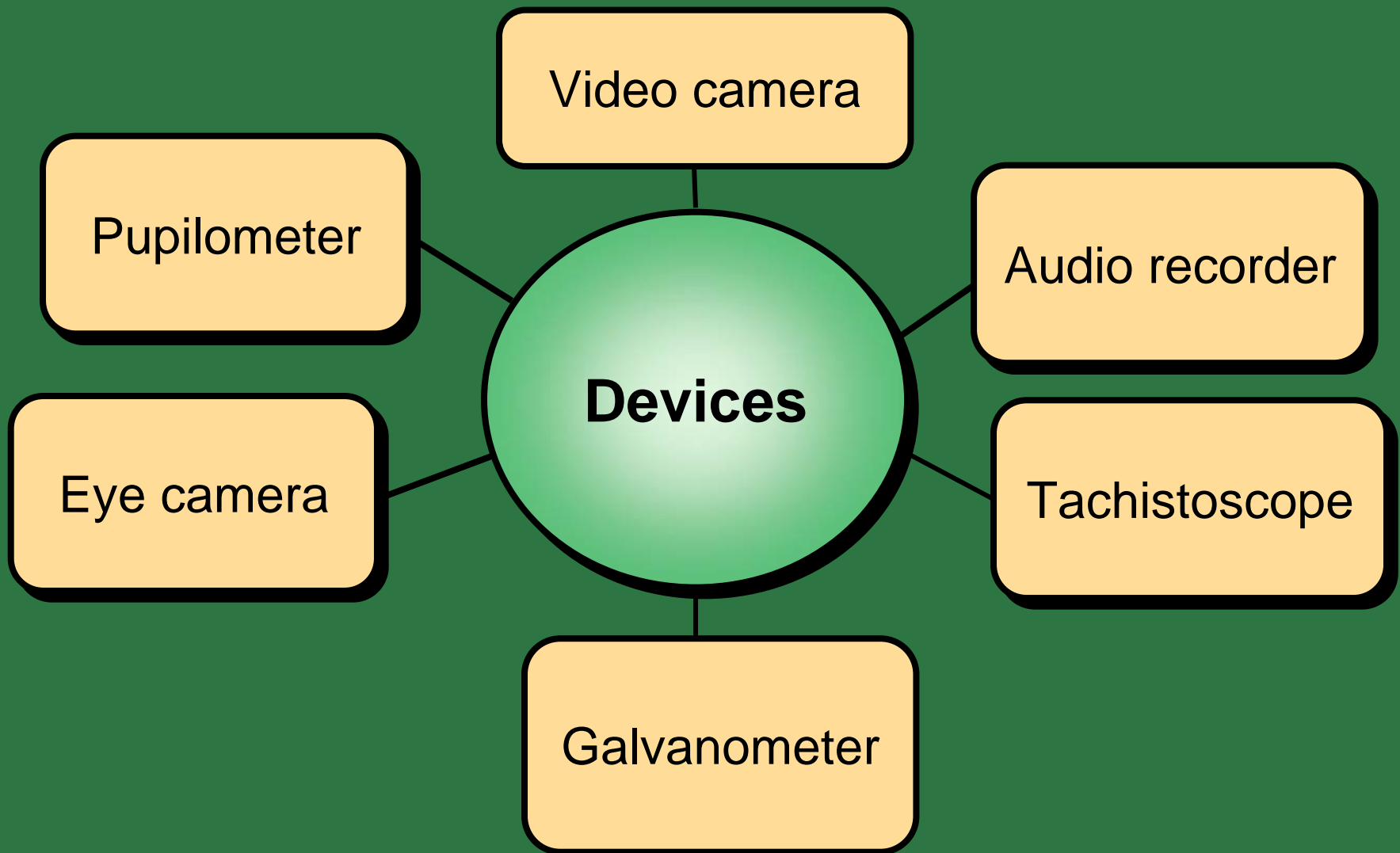
Systematic Observation



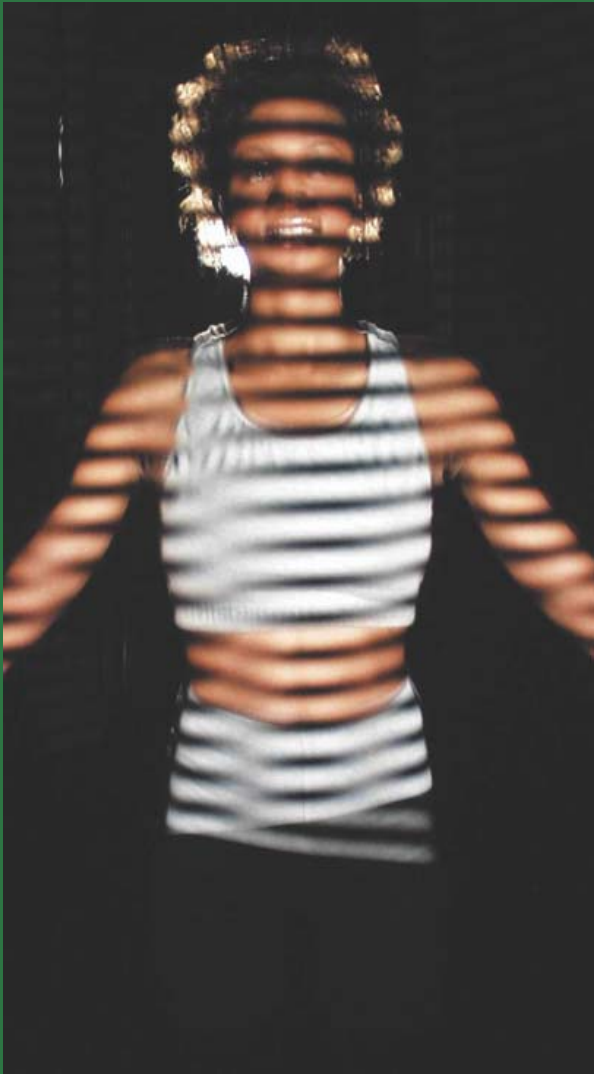
Flowchart for Checklist Design



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



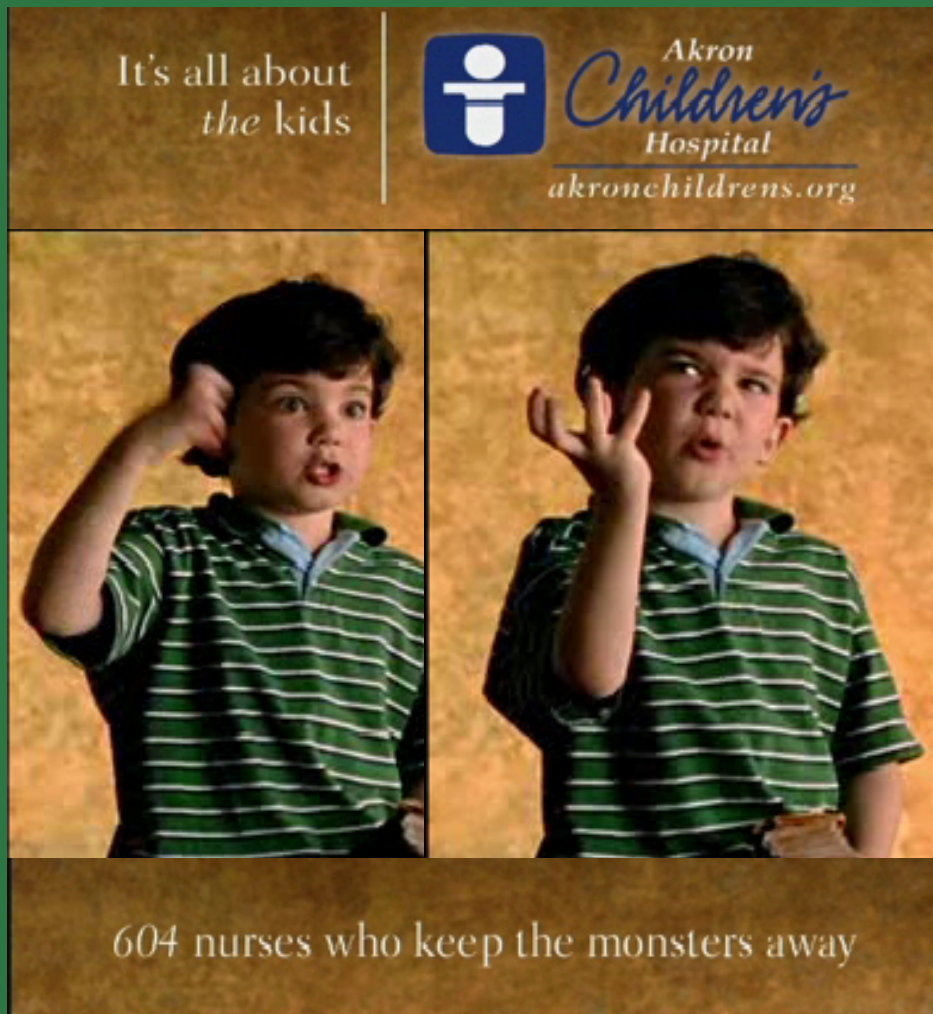
Vocal

Temporal

Interaction

Verbal Stylistic

Desired Characteristics for Observers



Concentration

Detail-oriented

Unobtrusive

Experience level


Errors Introduced by Observers



The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst are two hexagonal boxes. The left box is light orange and contains the text 'Halo Effect'. The right box is a darker orange and contains the text 'Observer Drift'.

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

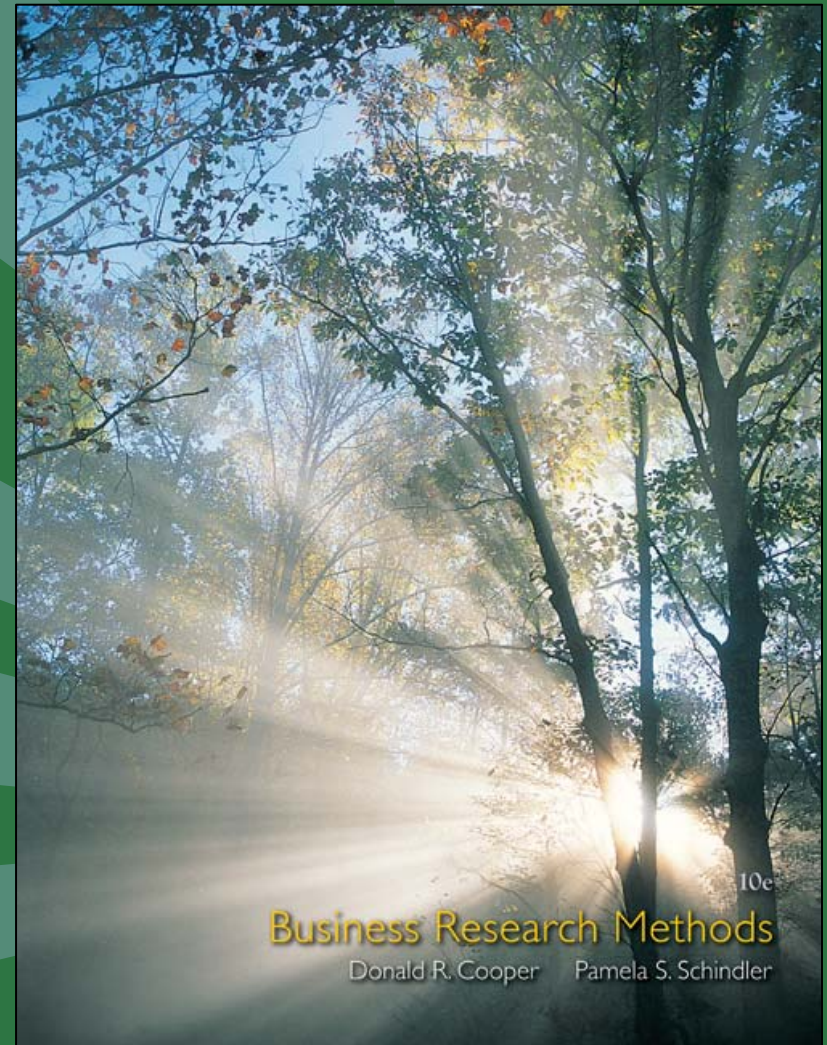



Key Terms

- | | |
|---|--|
| <ul style="list-style-type: none">• Observation checklist• Observer drift• Physical condition analysis• Physical trace• Process (activity) analysis | <ul style="list-style-type: none">• 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.

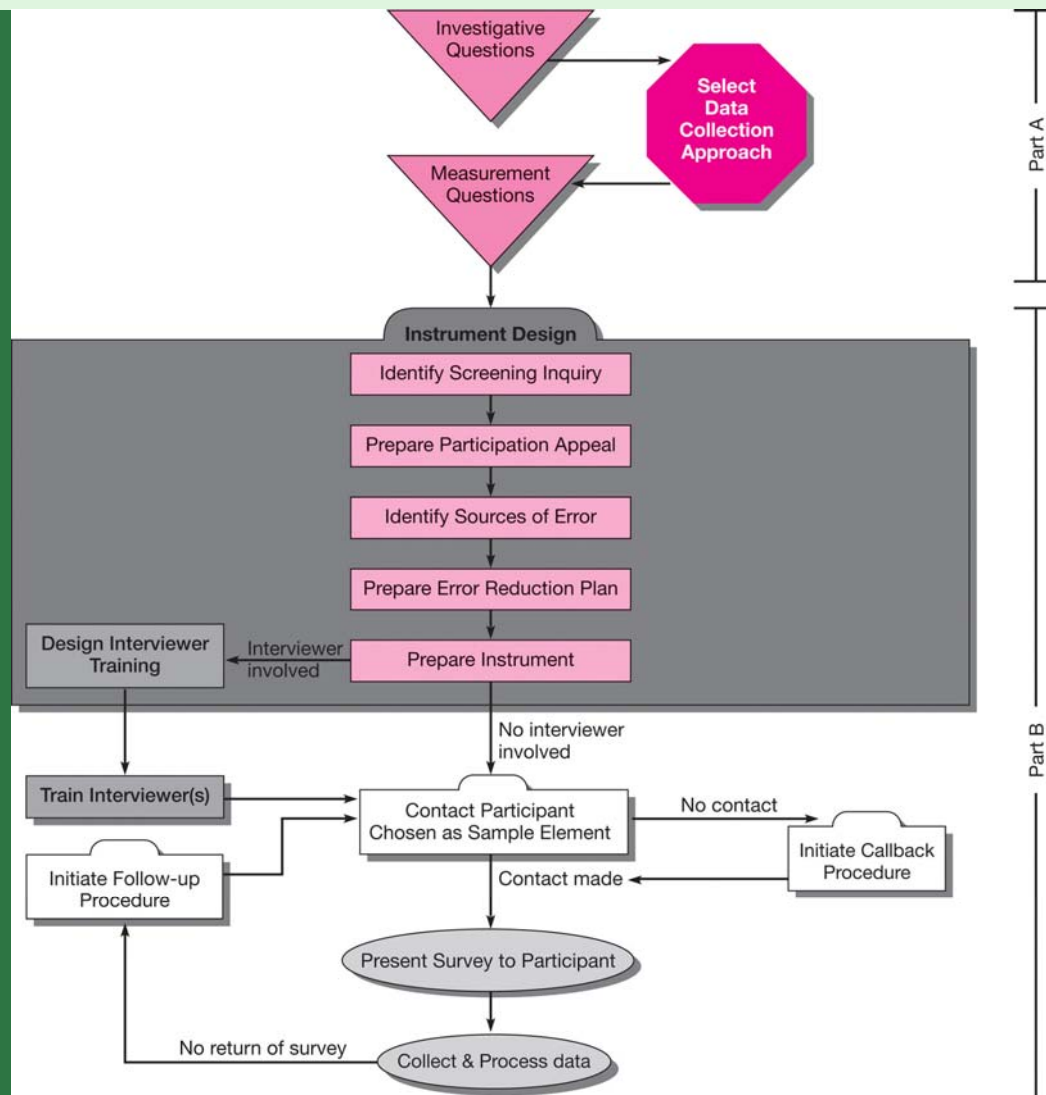


Dilemma for Surveys

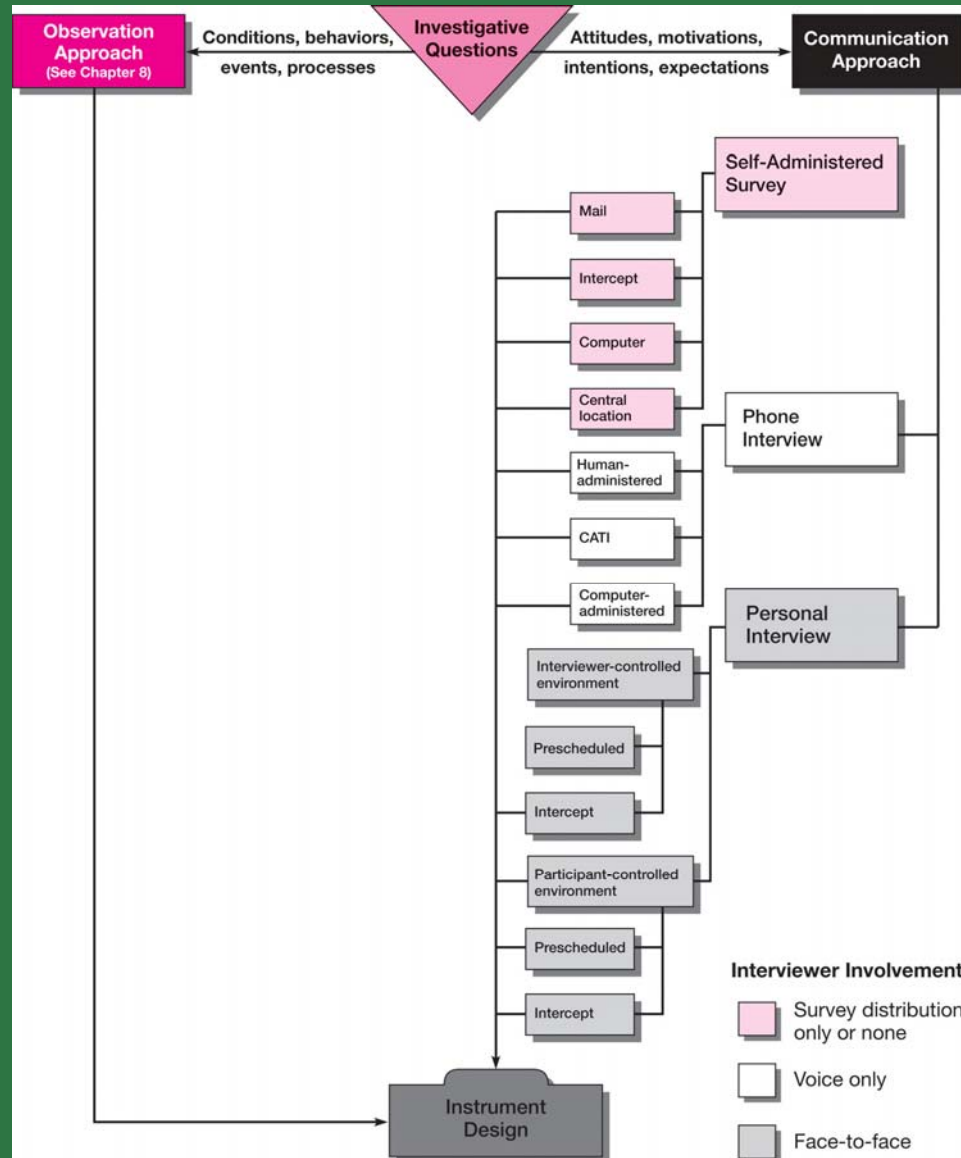
“The ubiquity of cell phones and the rapid and continuing development of the Internet have completely altered the way we talk to each other, the way marketers talk to customers, the way customers shop and the way the media research their audiences.”

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

Data Collection Approach



Selecting a Communication Data Collection Approach



Communication Approach

Strengths

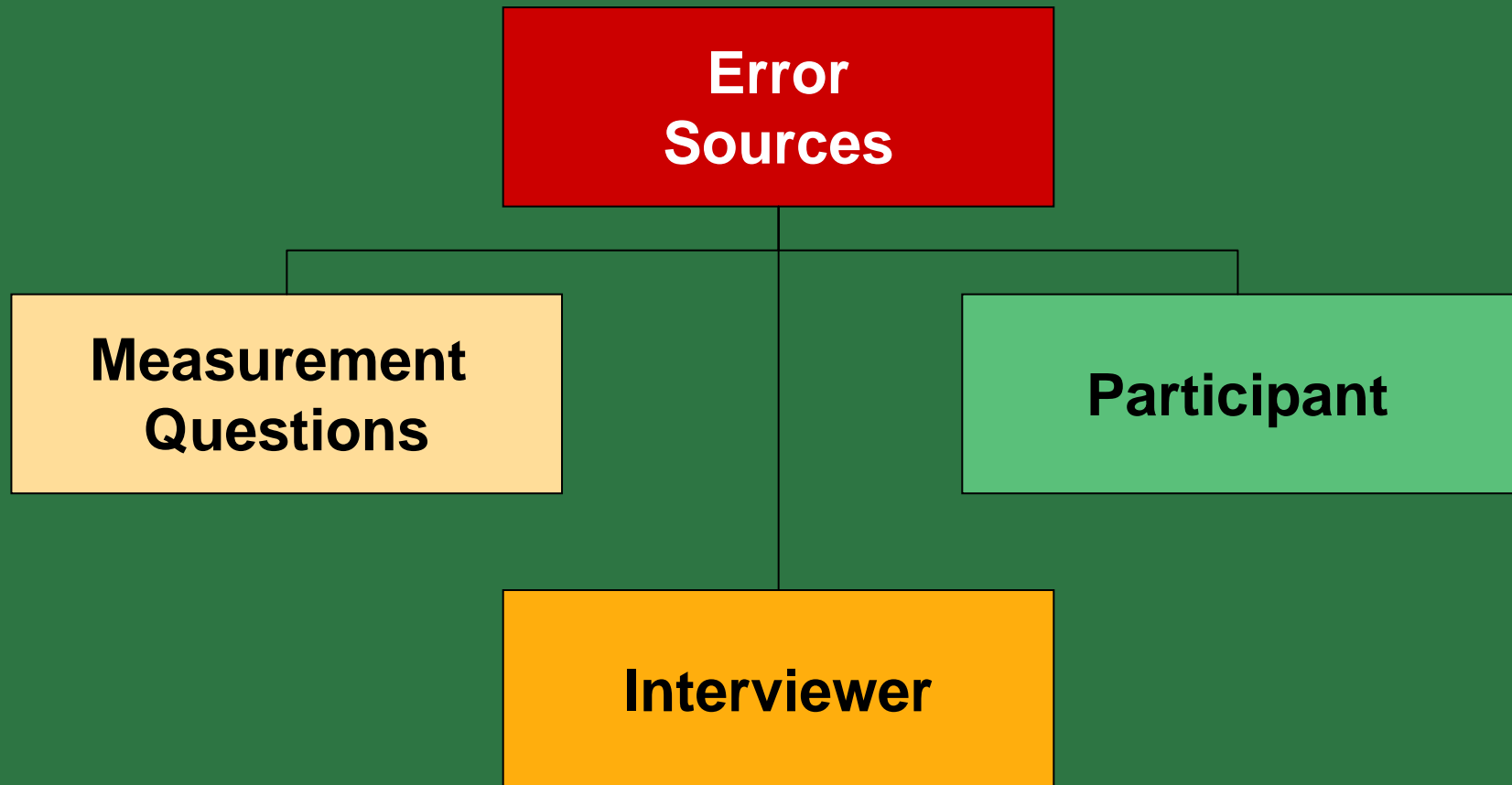
- Versatility
- Efficiency
- Geographic coverage

Weaknesses

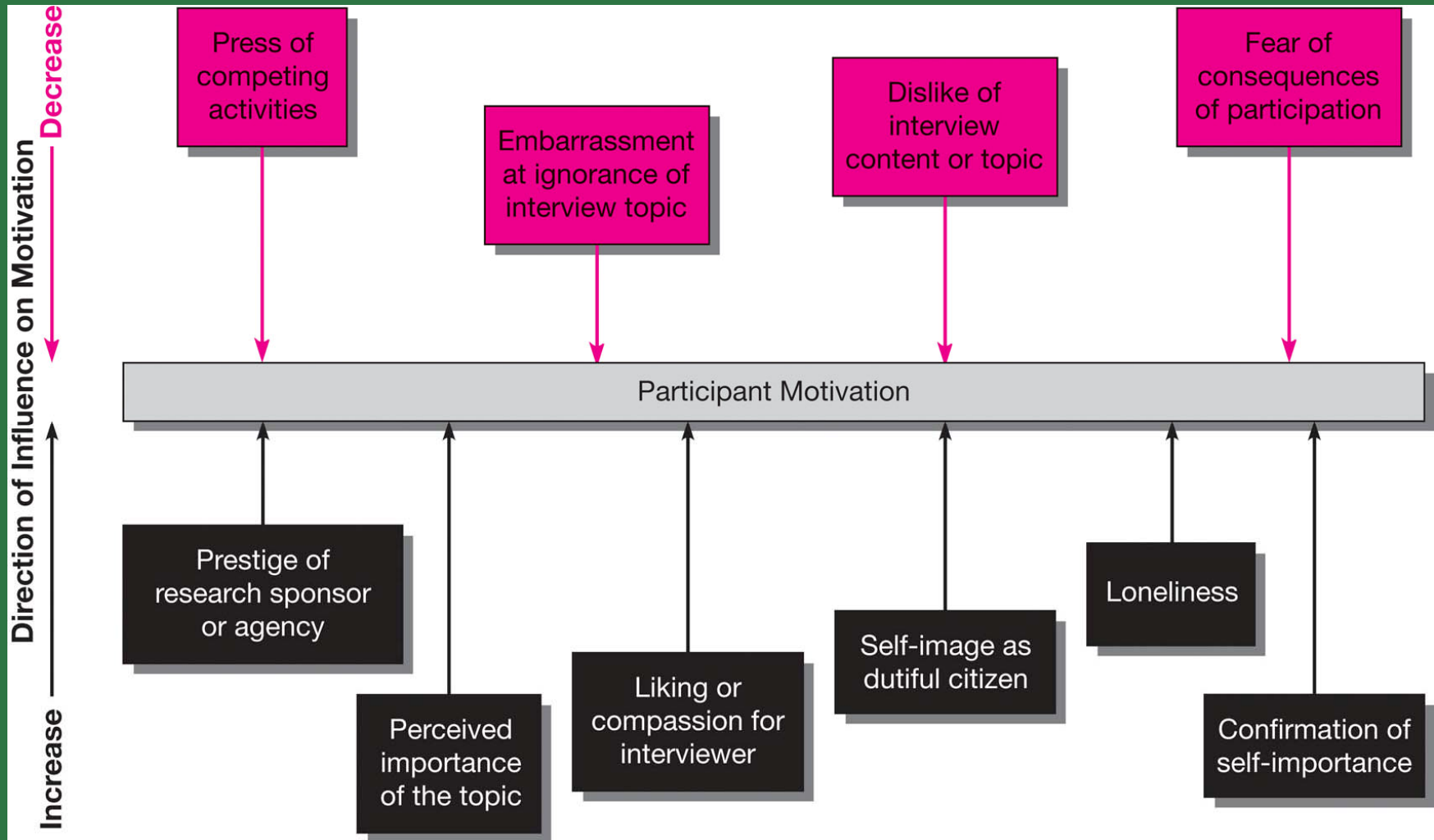
- Error
- Inaccessible populations



Sources of Error



Participant Motivation



Response Terms

Noncontact rate

Refusal rate

Incidence rate



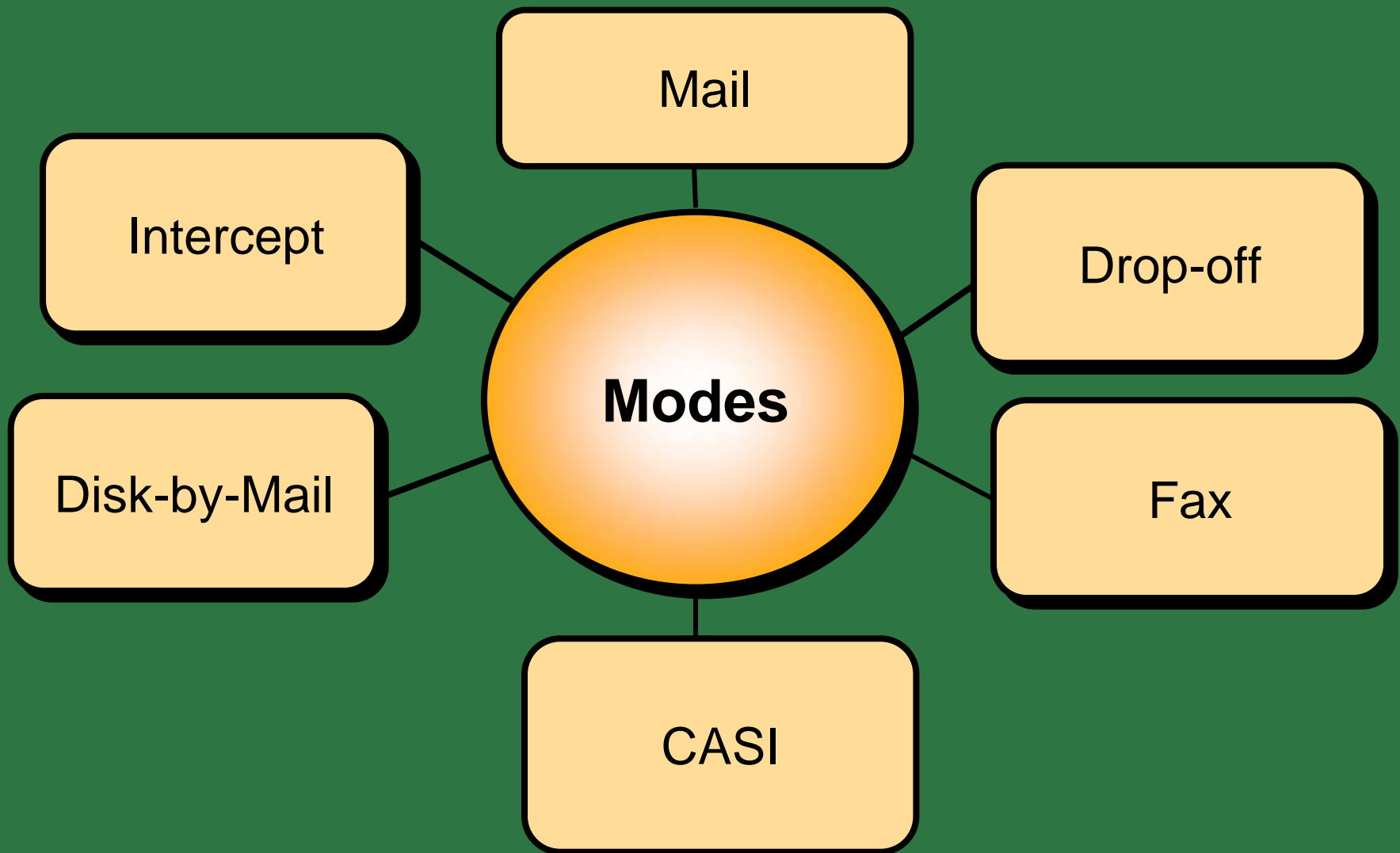
Communication Approaches

**Self-
Administered
Survey**

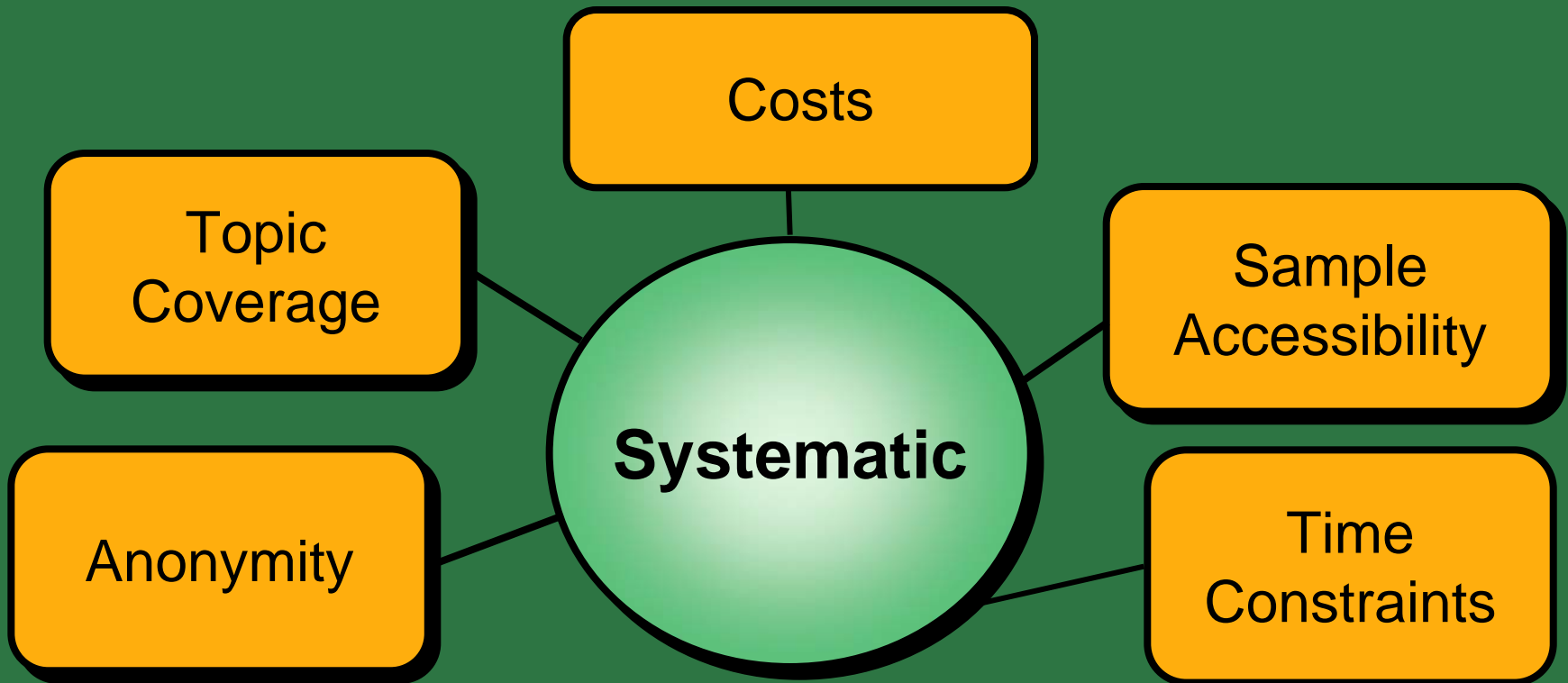
**Telephone
Survey**

**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

The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst, there are two side-by-side, horizontally-oriented hexagonal shapes. The left hexagon is light orange and contains the text 'Fee-Based Service'. The right hexagon is a darker orange and contains the text 'Surveying Software'.


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



Traditional

CATI systems

Computer-
administered

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



The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst, there are two overlapping hexagonal shapes. The left hexagon is light orange and contains the text 'CAPI'. The right hexagon is a darker orange and contains the text 'Intercept'. The two hexagons overlap in the middle, with the 'Intercept' hexagon slightly behind the 'CAPI' one.

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

- | | |
|--|---|
| <ul style="list-style-type: none">• Communication approach• Computer-administered telephone survey• Computer-assisted personal interviewing (CAPI)• Computer-assisted self interview (CASI) | <ul style="list-style-type: none">• Disk-by-mail survey• Computer-assisted telephone interviewing (CATI)• Intercept interview• Interviewer error• Mail survey• Noncontact rate• Nonresponse error |
|--|---|

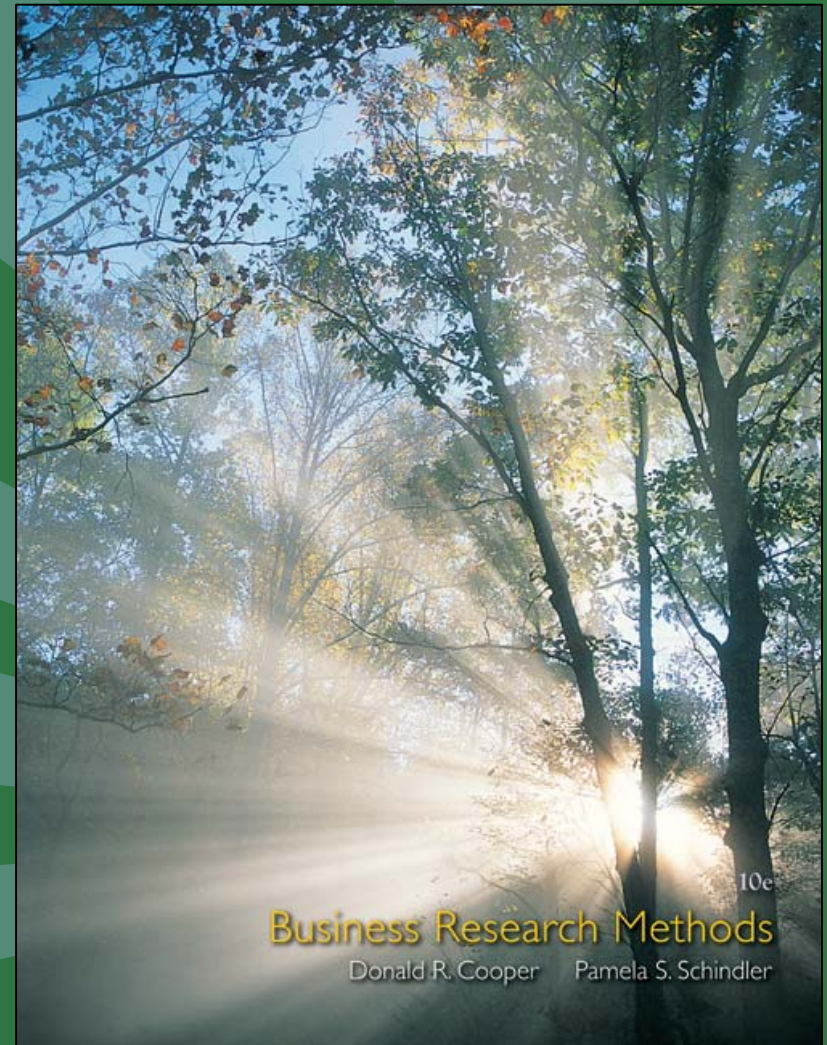



Key Terms (cont.)

- | | |
|---|---|
| <ul style="list-style-type: none">• Panel• Personal interview• Random dialing• Refusal rate• Response error | <ul style="list-style-type: none">• 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.

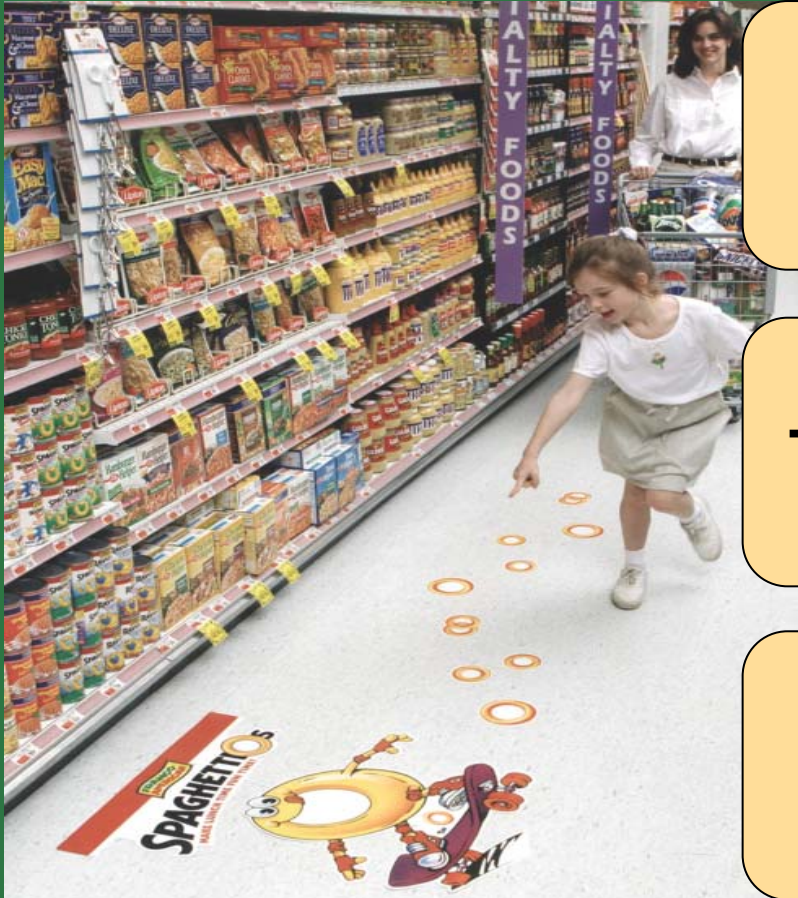


Experiments Challenge Perceptions

“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.



Nonstop Support

www.cfmc.com

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



Evaluation of Experiments

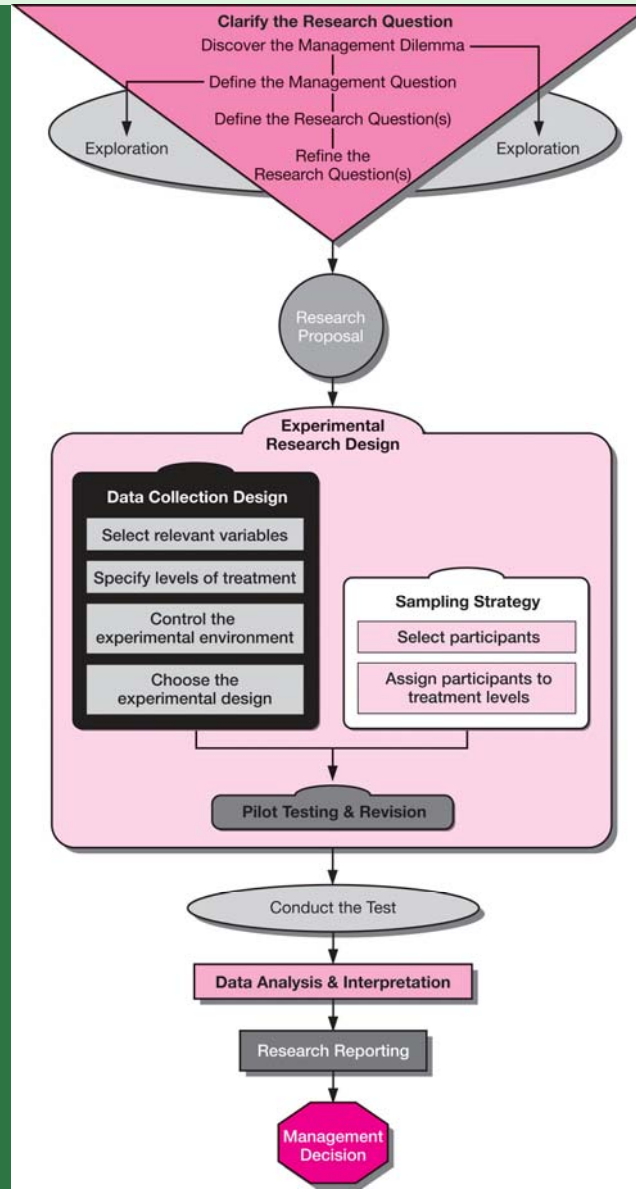
Advantages

- 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



```
graph TD; A[Specify treatment variables] --> B[Specify treatment levels]; B --> C[Control environment]; C --> D[Choose experimental design]; D --> E[Select and assign participants]; E --> F[Pilot-test, revise, and test]; F --> G[Collect data]; G --> H[Analyze data];
```

Specify treatment variables

Specify treatment levels

Control environment

Choose experimental design

Select and assign participants

Pilot-test, revise, and test

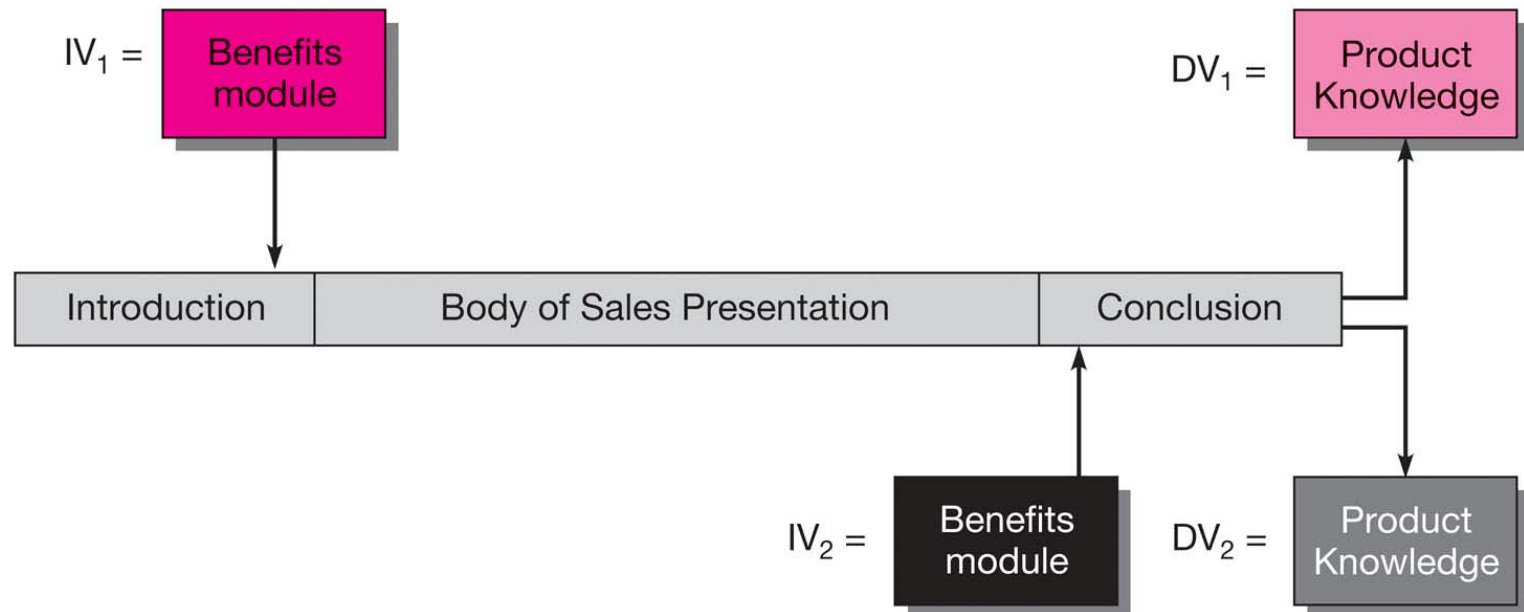
Collect data

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.

$$\text{Effect} = DV_1 - DV_2$$



Selecting and Assigning Participants

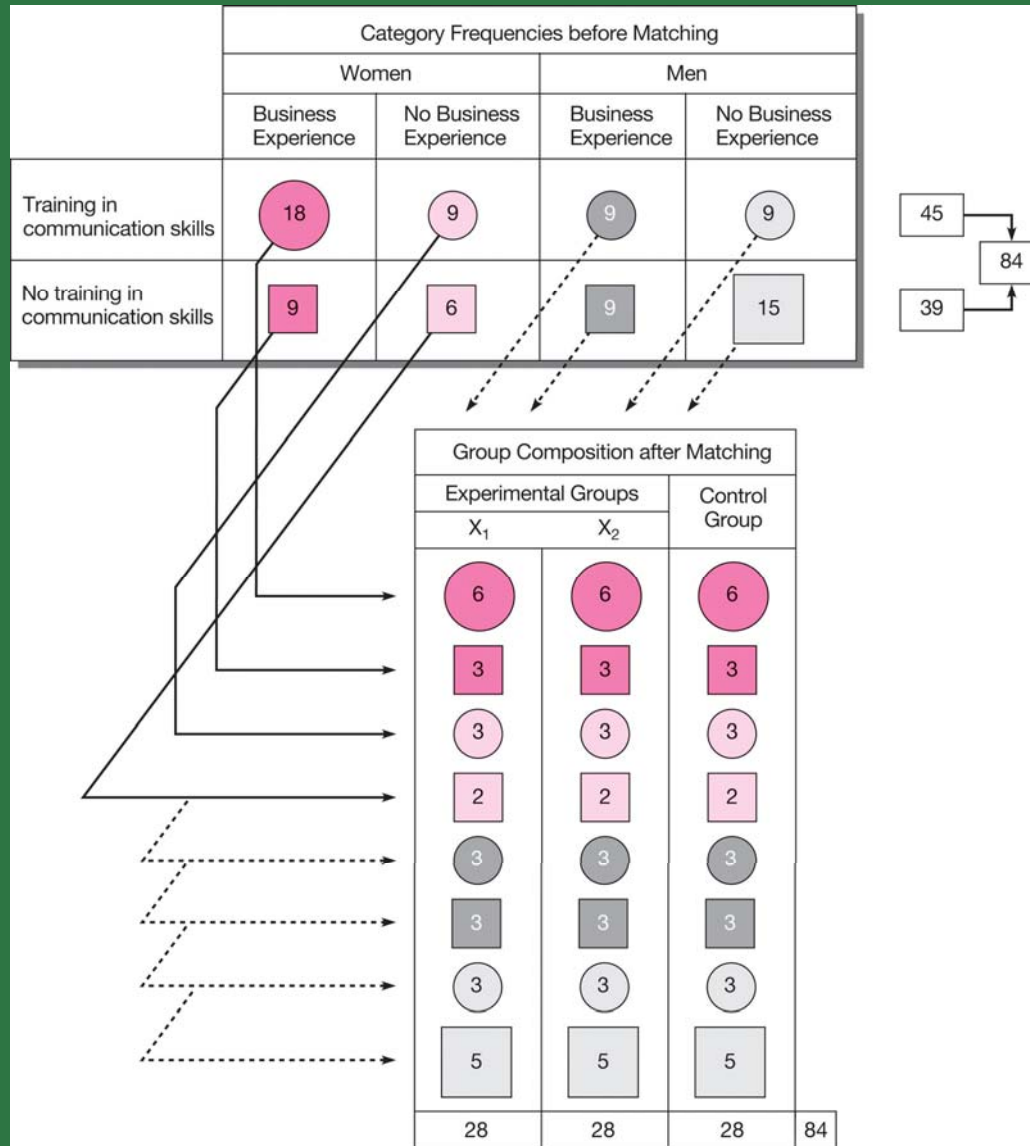
Random
assignment

Matching

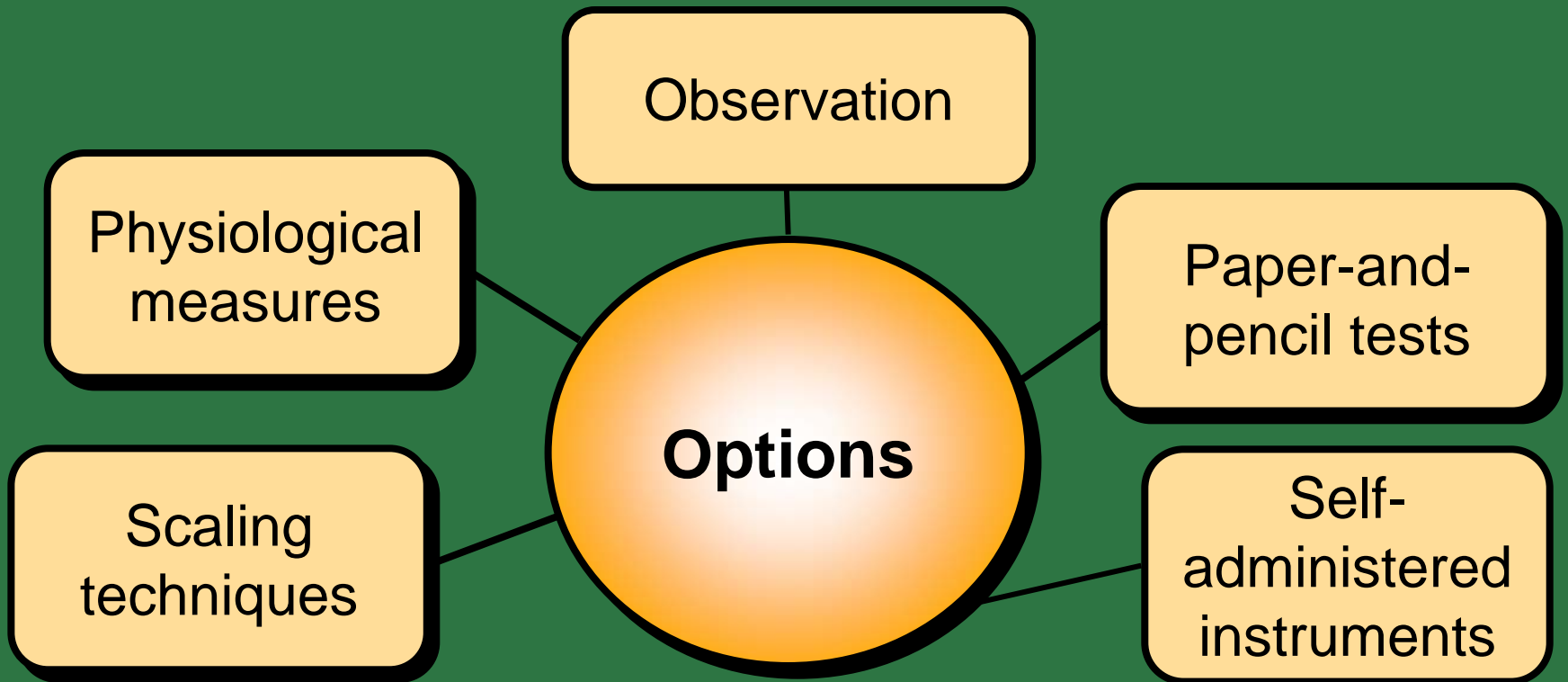
Random Assignment



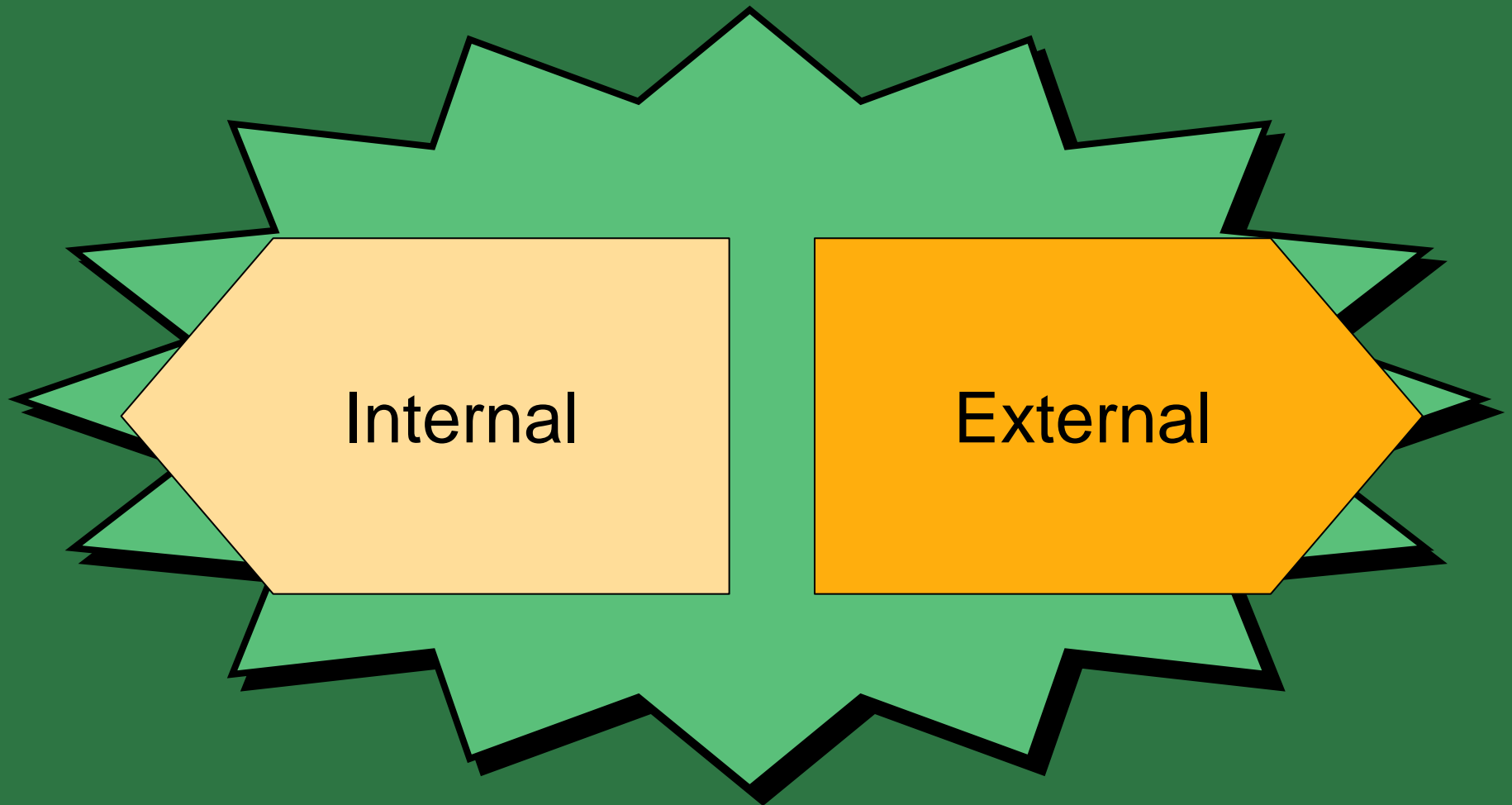
Quota Matrix Example



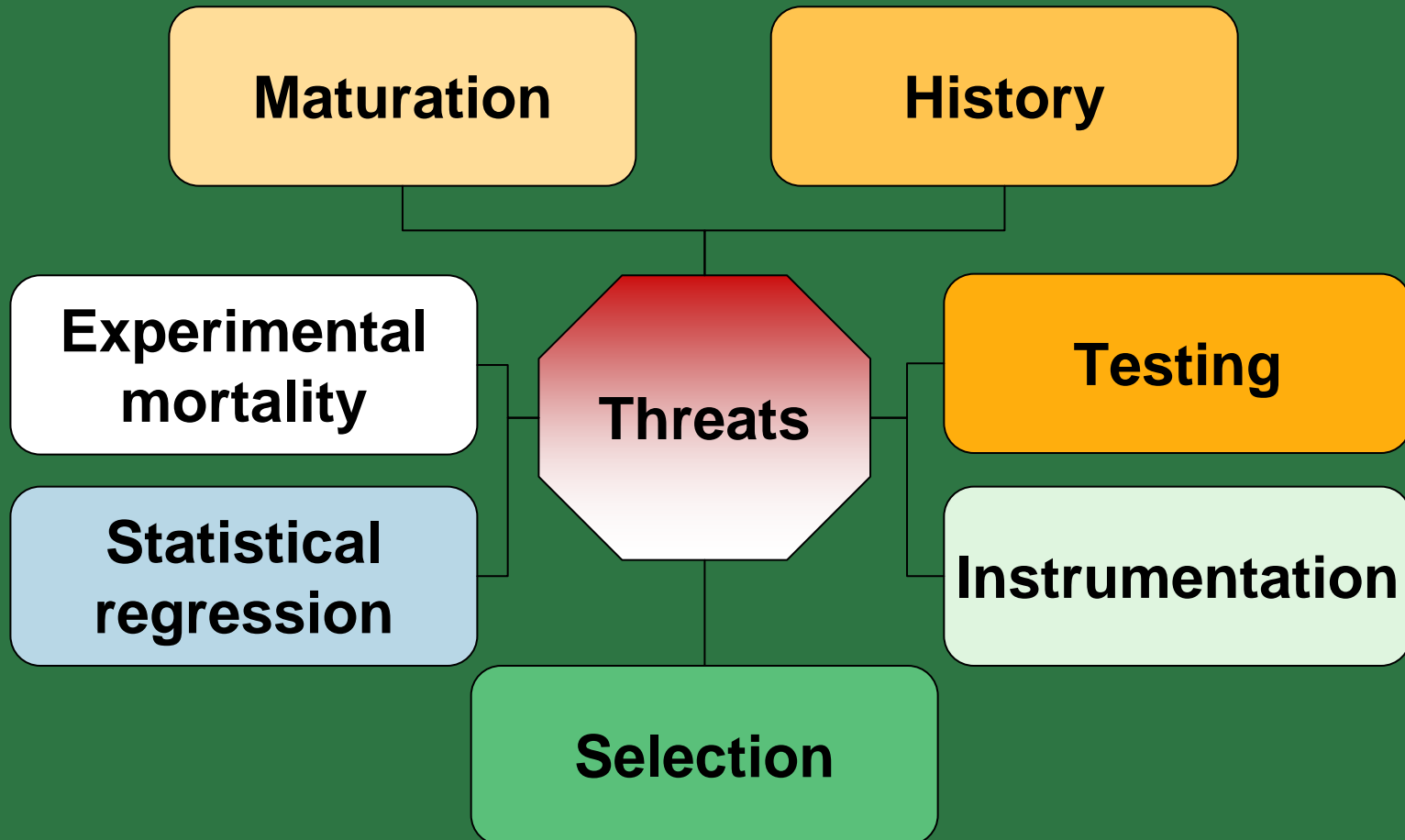
Measurement Options



Validity in Experimentation



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

Reactivity of
testing on X

Interaction of
selection and X

Other
reactive factors

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



Next Question

Experimental Research Designs

Pre-experiments

True experiments

Field experiments

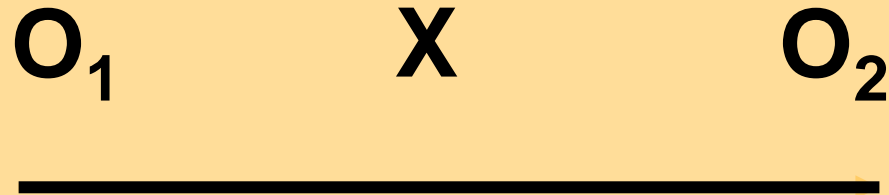
After-Only Case Study

X O



Pre-experiment

One Group Pretest-Posttest Design



Static Group Comparison

X

O₁

.....

.....

O₂



Pre-experiment

Pretest-Posttest Control Group Design

R O₁ X O₂
R O₃ O₄



True experiment

Posttest-Only Control Group Design

R	X	O₁
R		O₂



True experiment

Nonequivalent Control Group Design

O_1
 O_3

X

O_2
 O_4



Field experiment

Separate Sample Pretest-Posttest Design

R

R

O_1

(X)

X

O_2



Field experiment

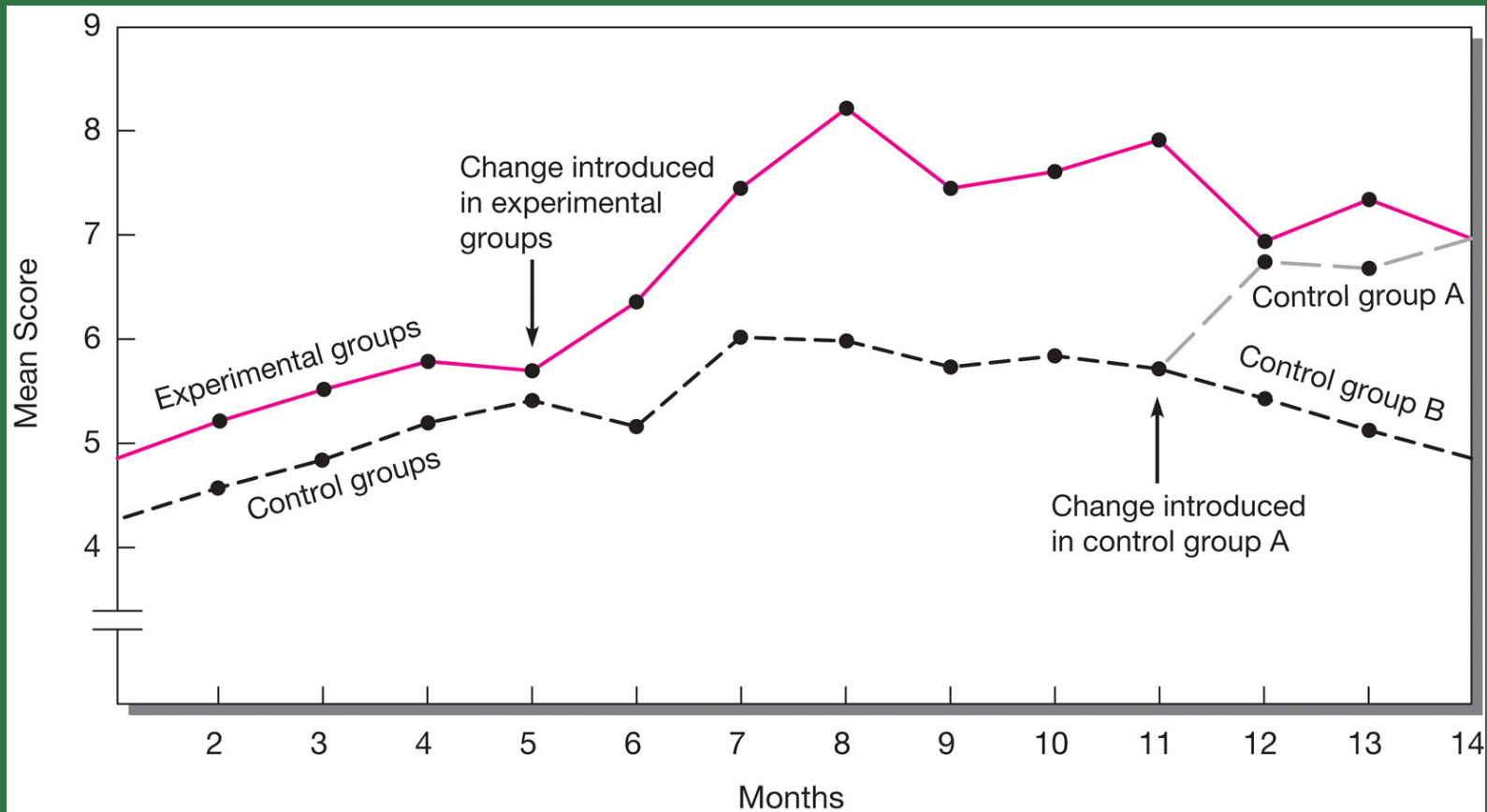
Group Time Series Design

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}



Field experiment

Job Enrichment Quasi-Experiment




Experiment: Finding the Store Design




Experiment: The Right Size of Flavor





Key Terms

- | | |
|--|--|
| <ul style="list-style-type: none">• Blind• Control group• Controlled test market• Dependent variable• Double-blind• Environmental control | <ul style="list-style-type: none">• Experiment• Experimental treatment• External validity• Field experiment• Hypothesis• Independent variable• Internal validity |
|--|--|

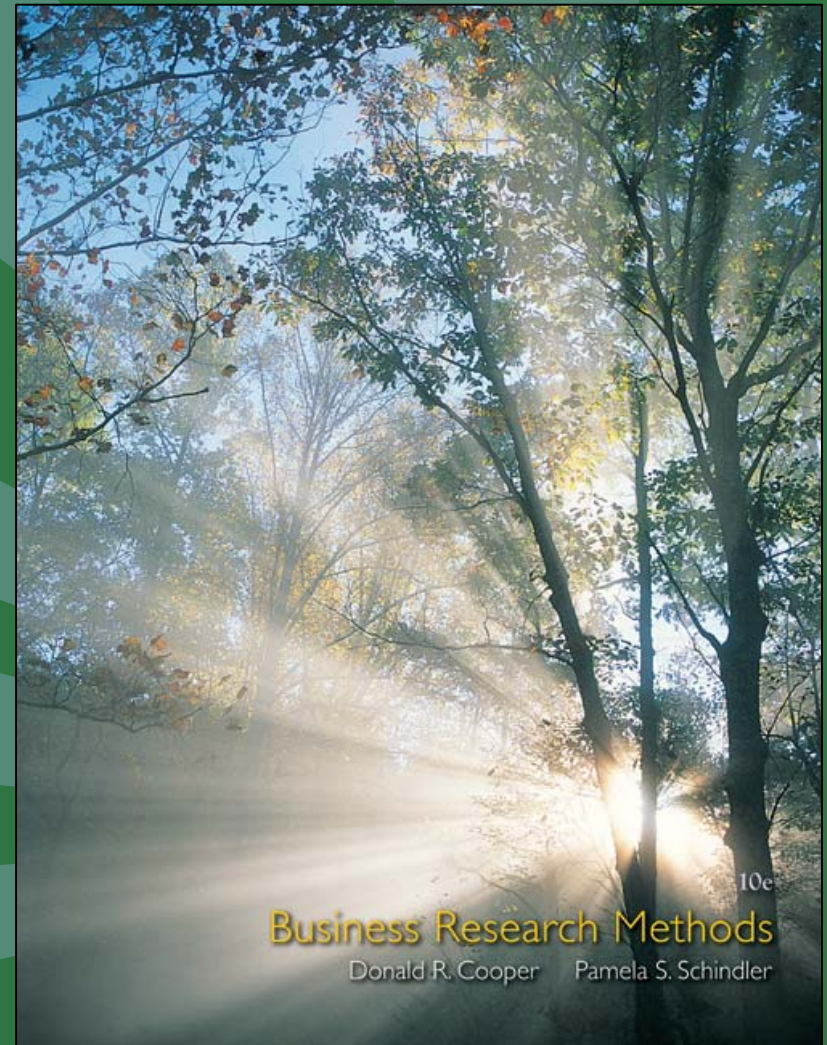


Key Terms

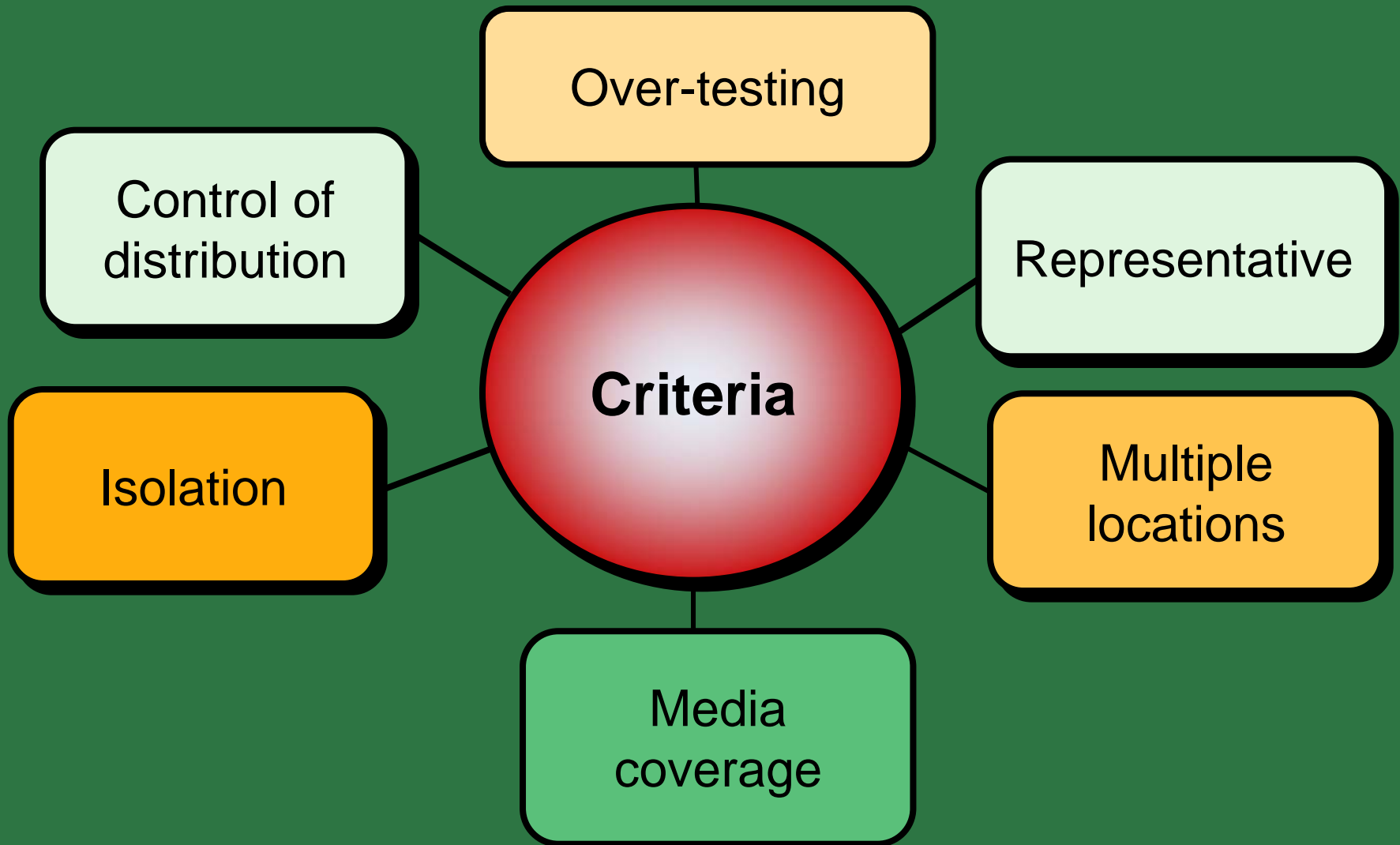
- | | |
|---|---|
| <ul style="list-style-type: none">• Matching• Operationalized• Quota matrix• Random assignment• Replication | <ul style="list-style-type: none">• Test market<ul style="list-style-type: none">– Electronic test market– Simulated test market– Standard test market– Virtual test market• Treatment levels• Web-enabled test market |
|---|---|

Appendix 10b

Test Markets



Test Market Selection



Types of Test Markets



Standard

Controlled

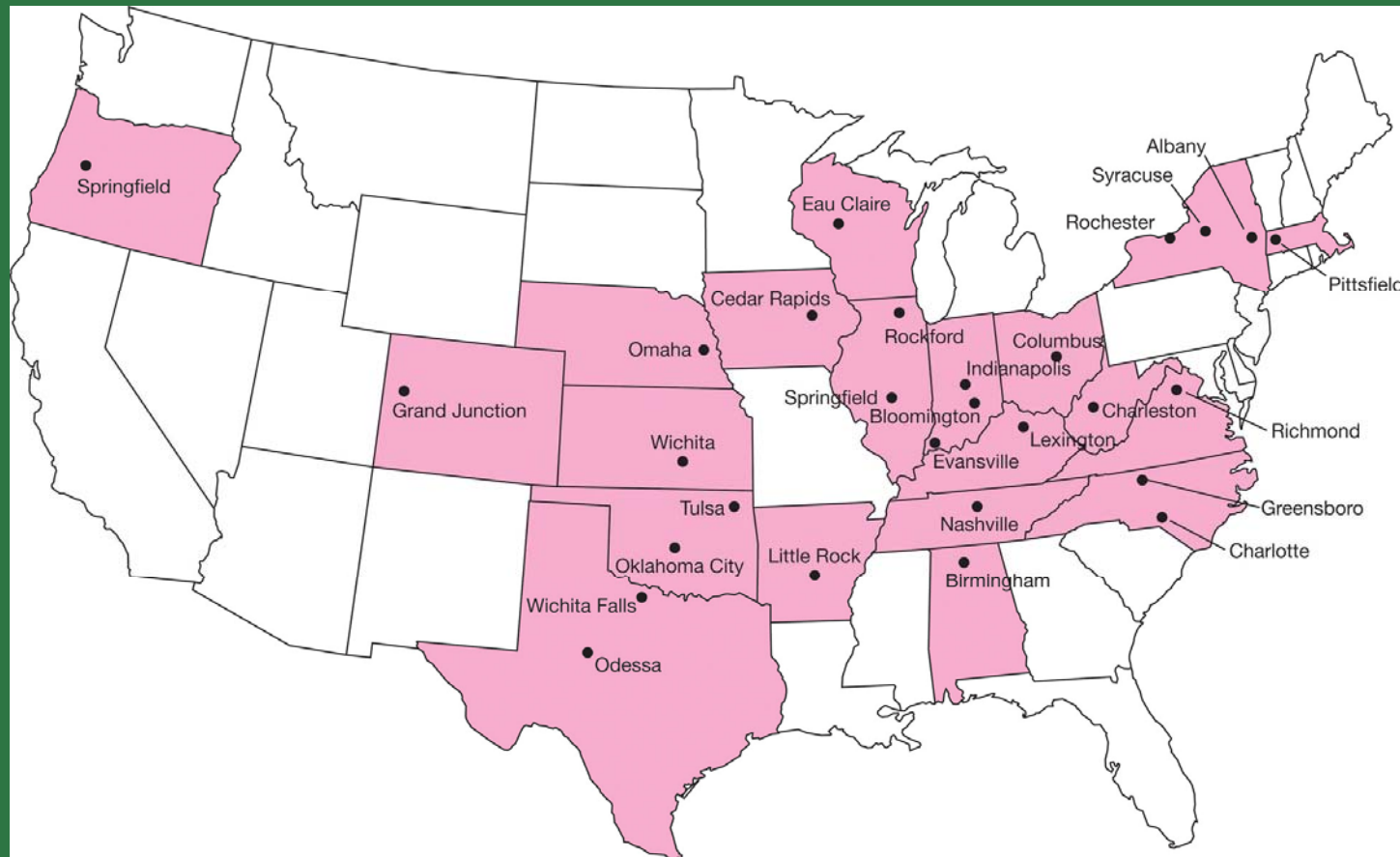
Electronic

Simulated

Virtual

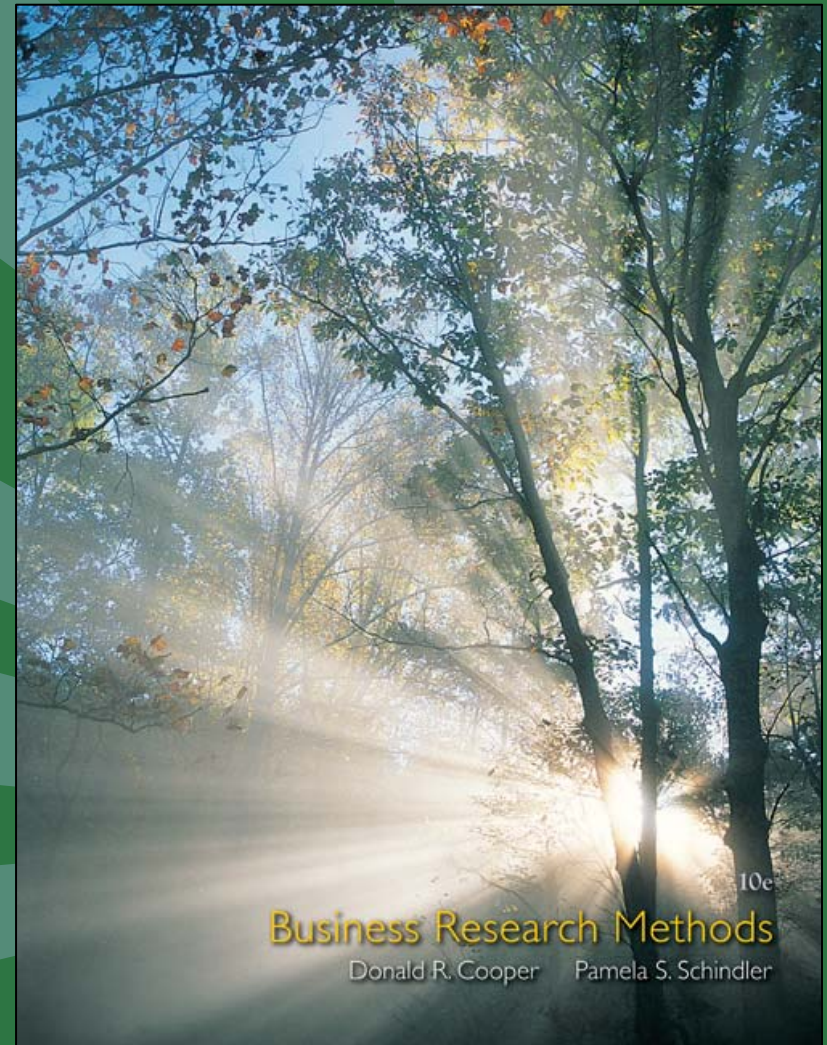
Web-enabled


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

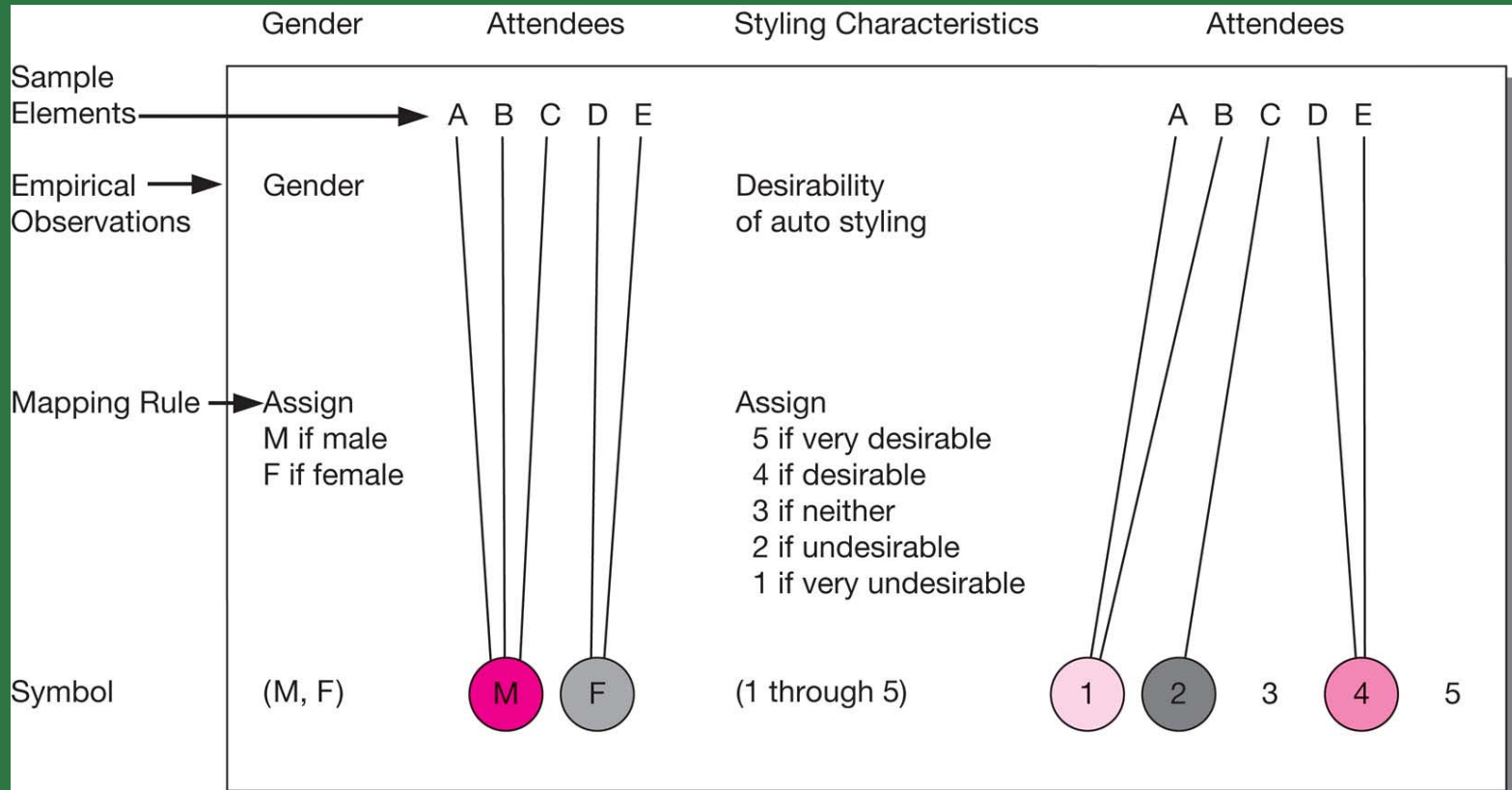
**Selecting
measurable phenomena**

**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

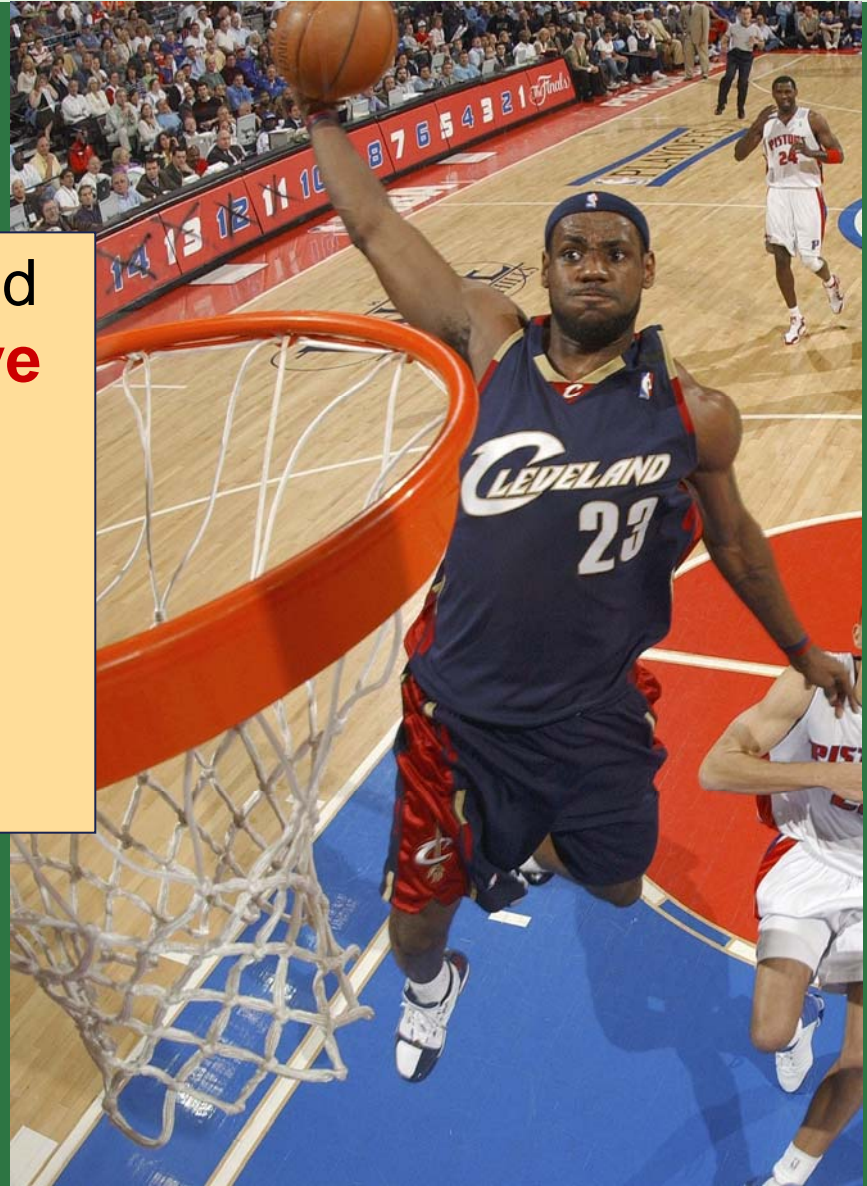
Ordinal

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

Order

Distance

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

Order

Distance

Ratio

Classification

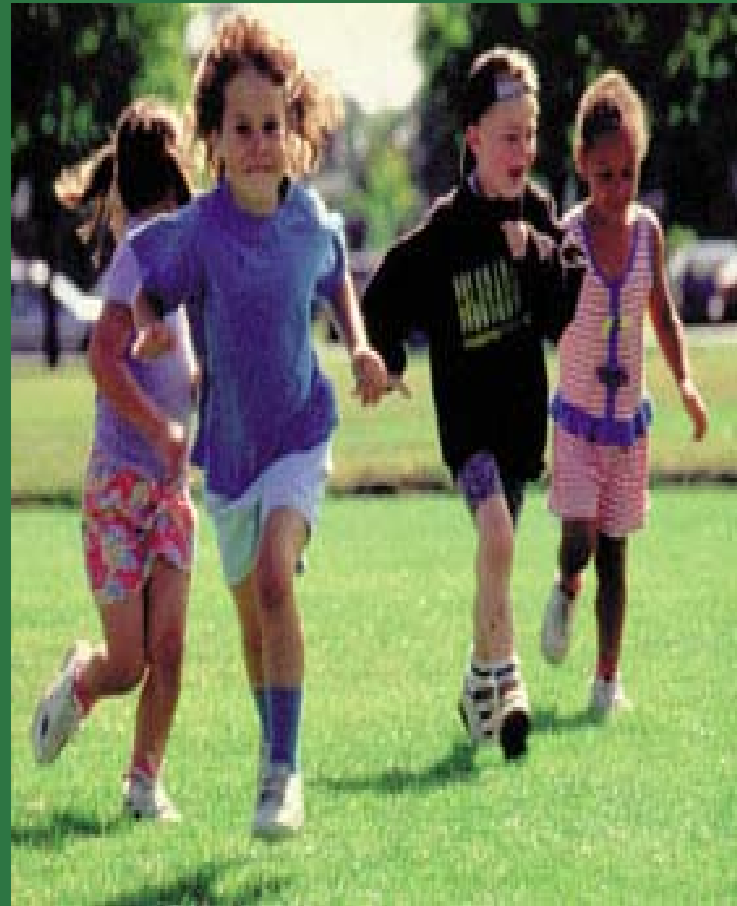
Order

Distance

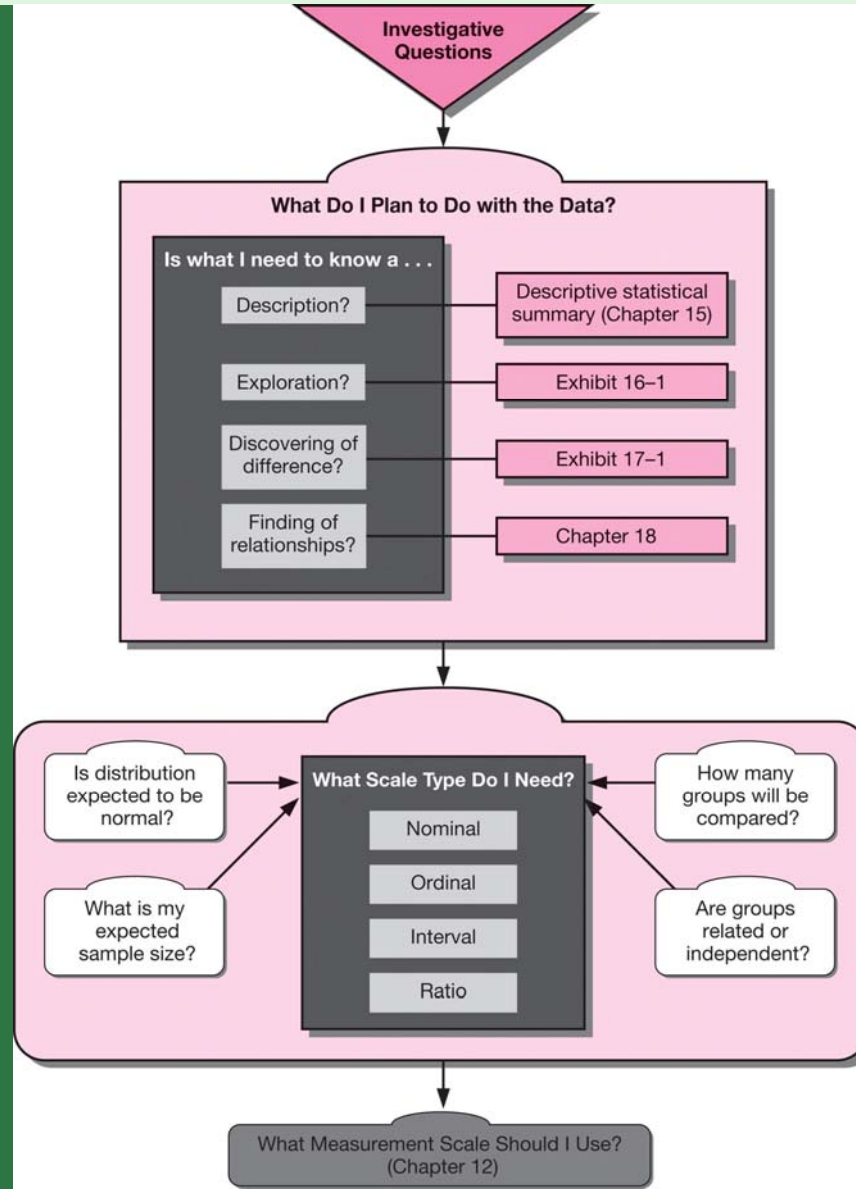
Natural Origin

Ratio Scales

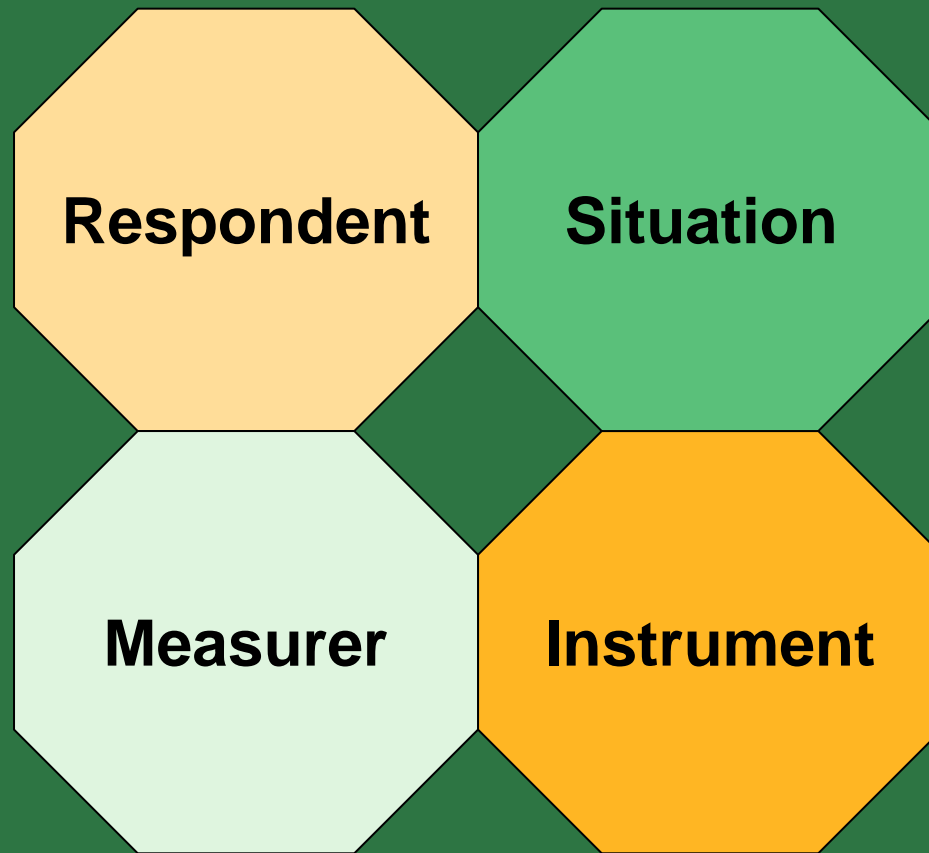
- Characteristics of previous scales plus an **absolute zero** point
- Examples
 - Weight
 - Height
 - Number of children



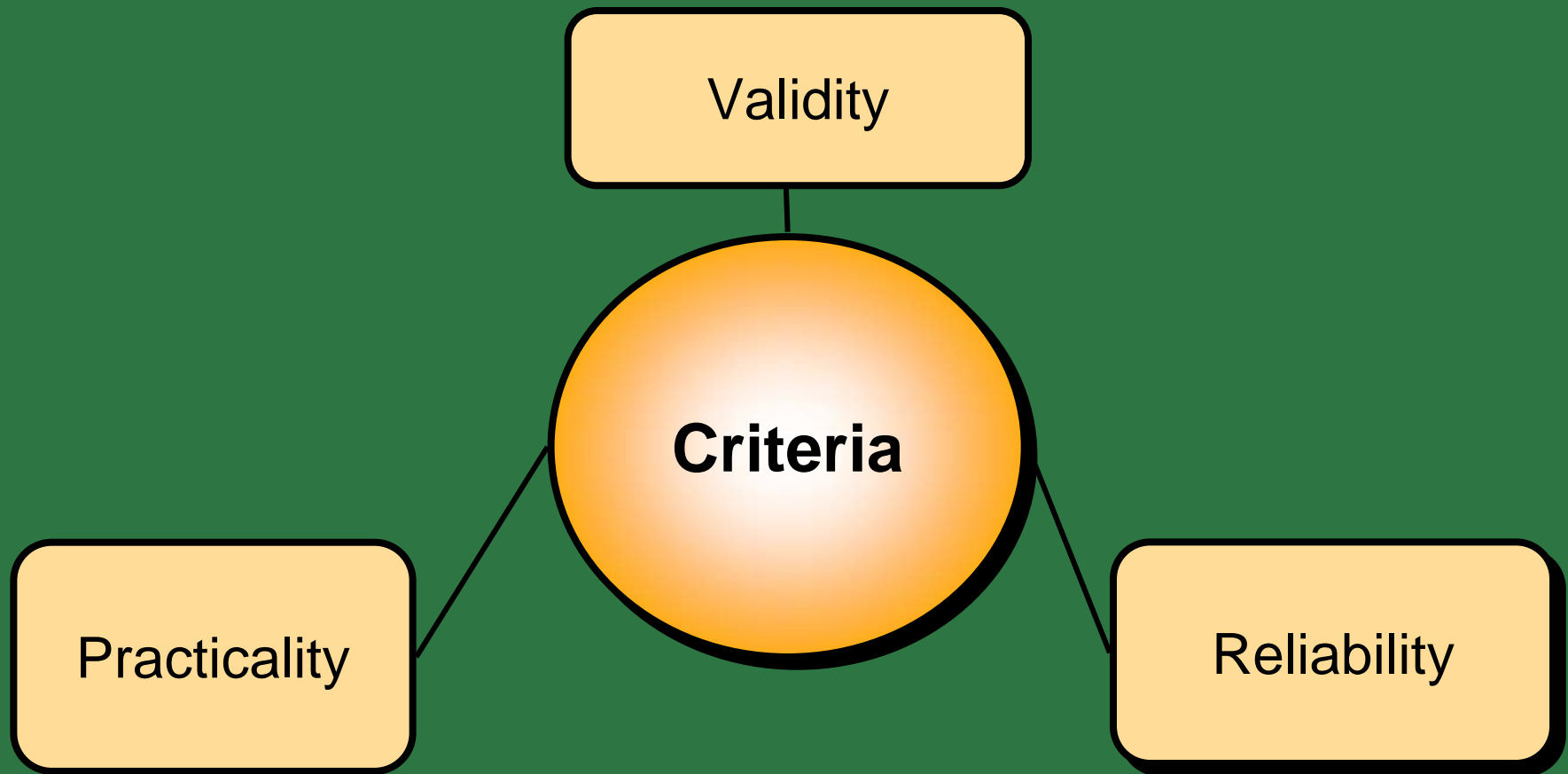
Moving from Investigative to Measurement Questions



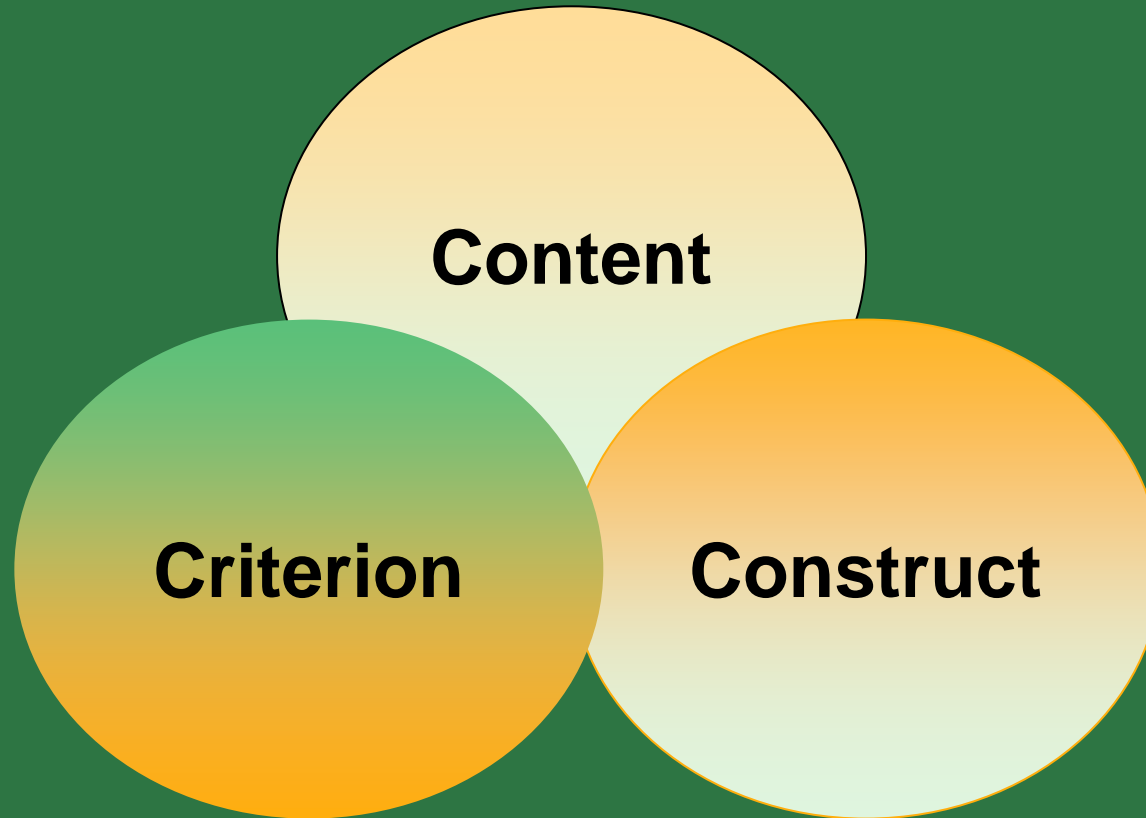
Sources of Error



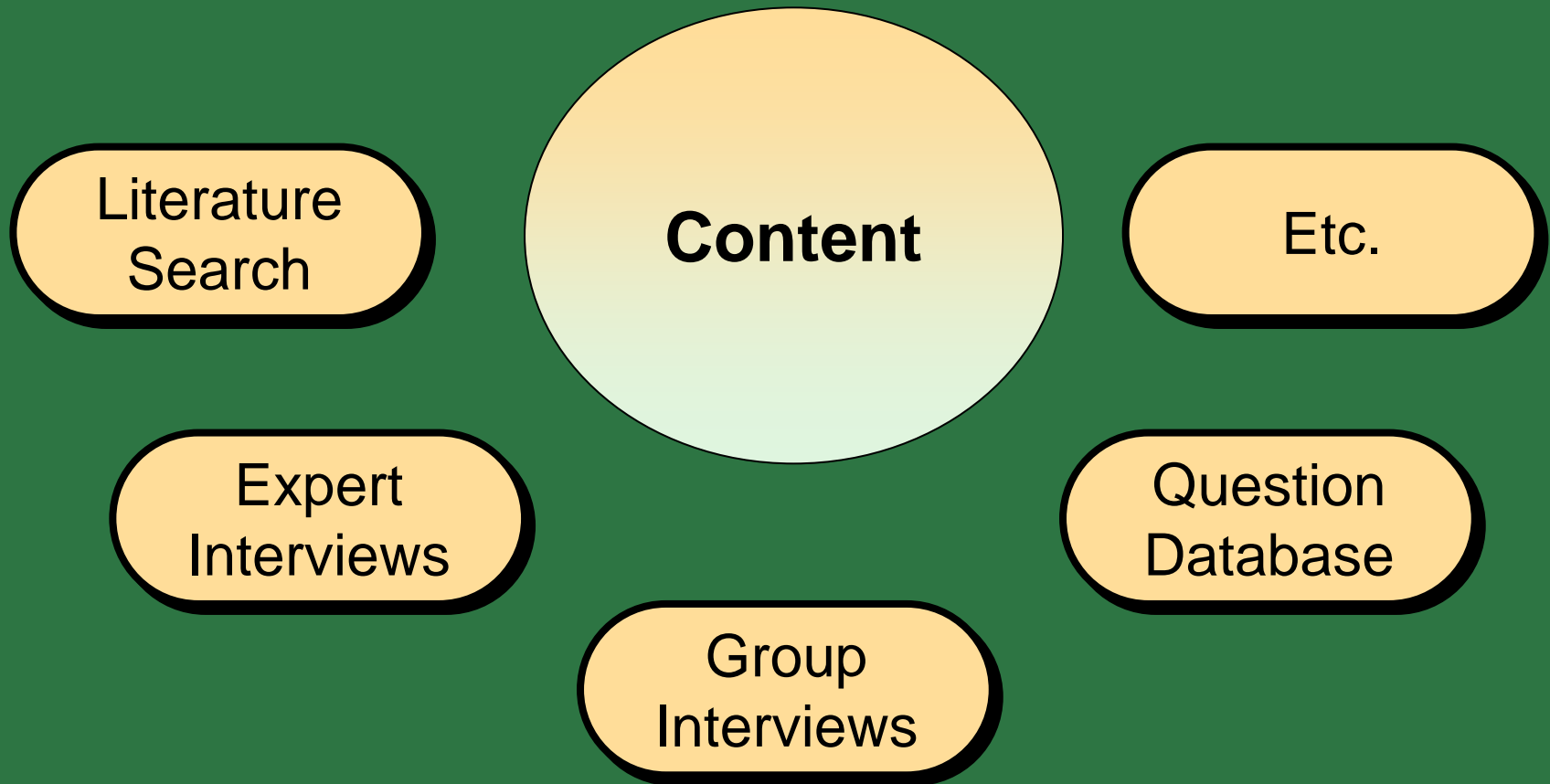
Evaluating Measurement Tools



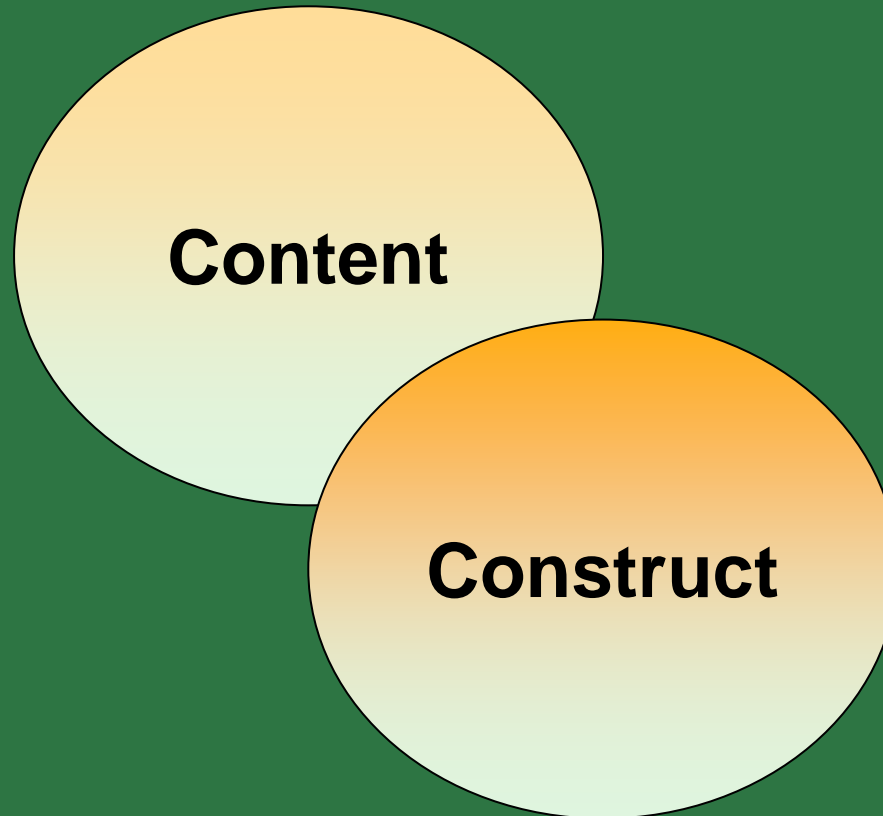
Validity Determinants



Increasing Content Validity



Validity Determinants



Increasing Construct Validity

New measure of trust

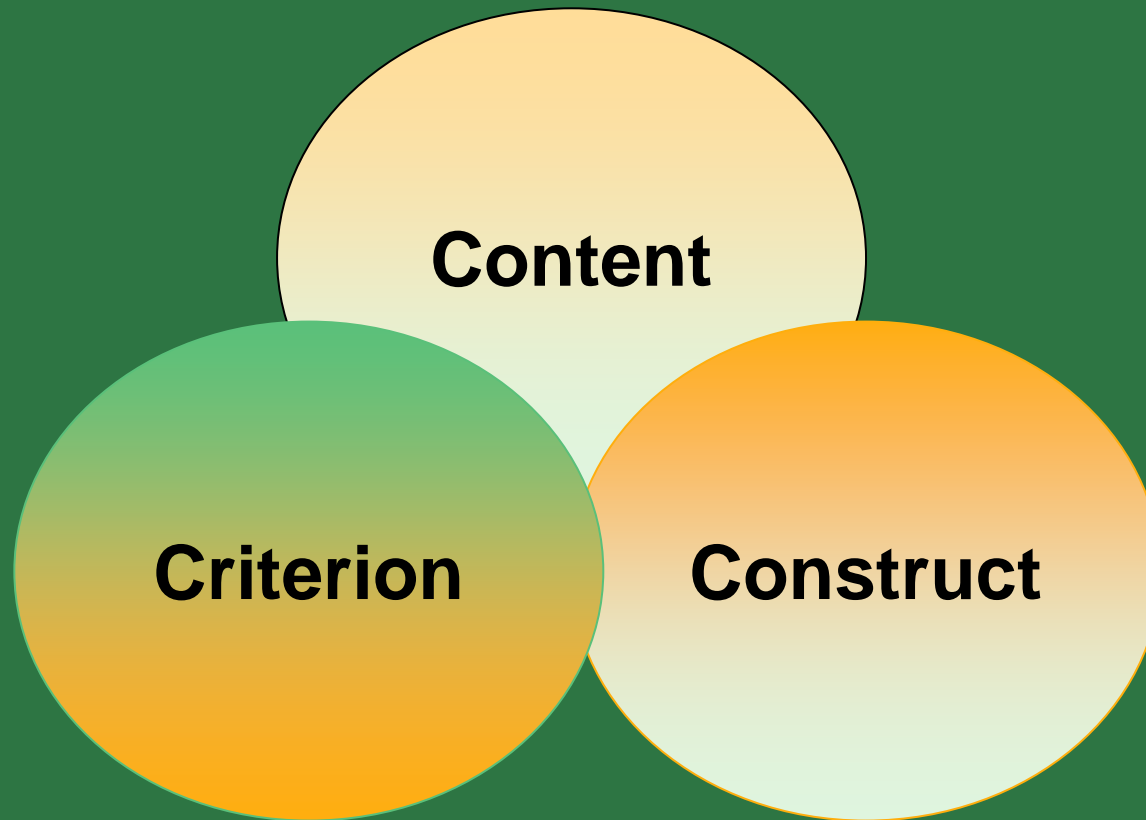
Known measure of trust

Empathy

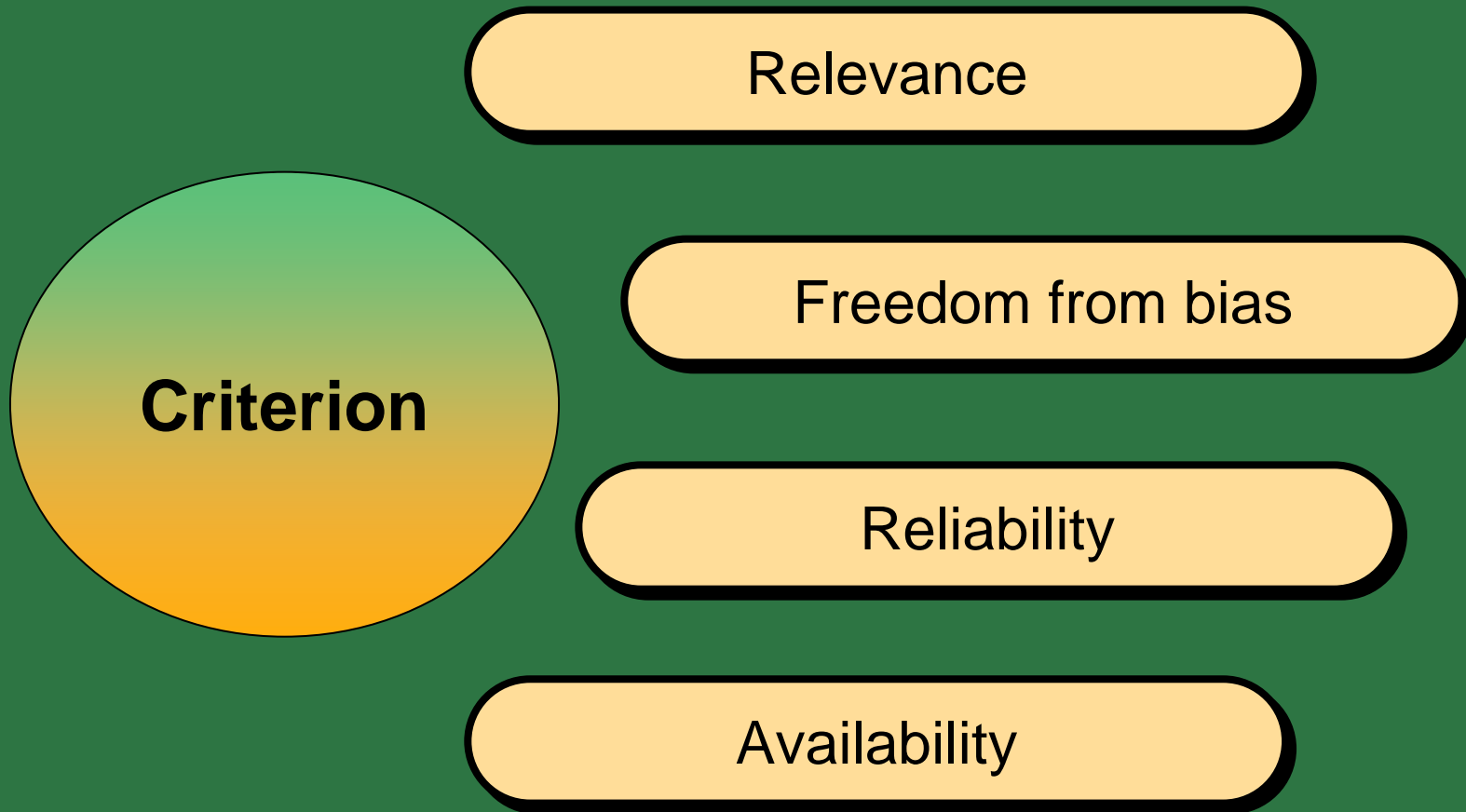
Credibility



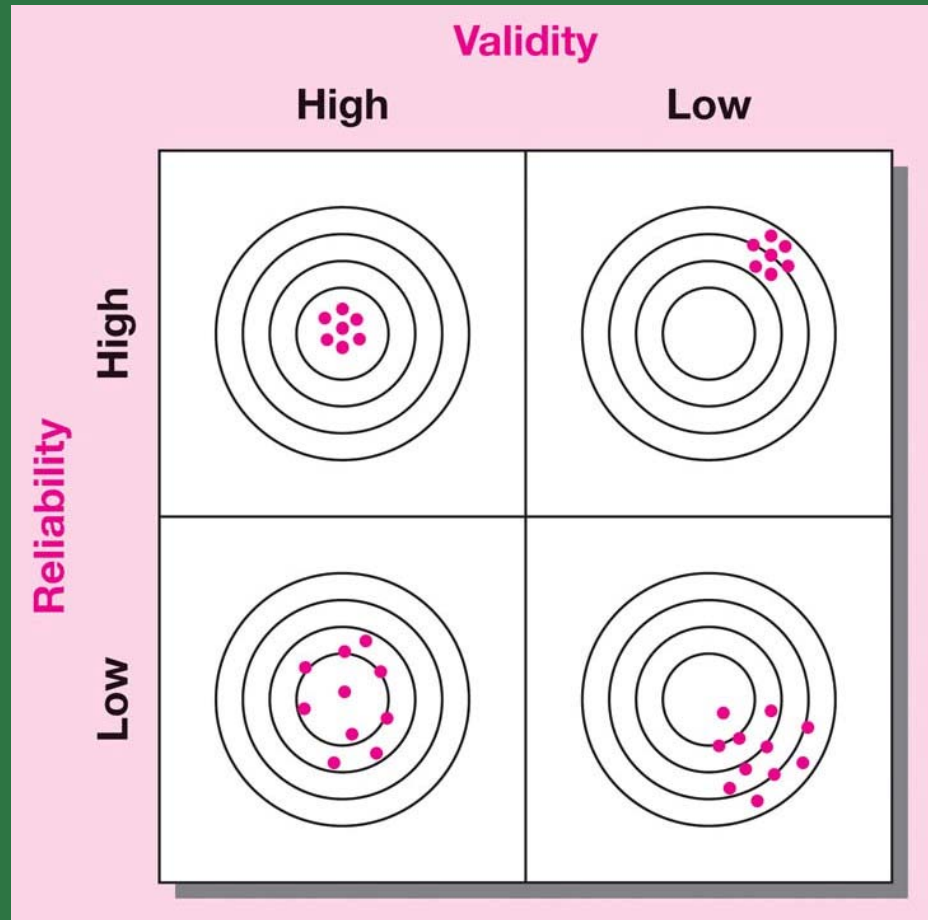
Validity Determinants



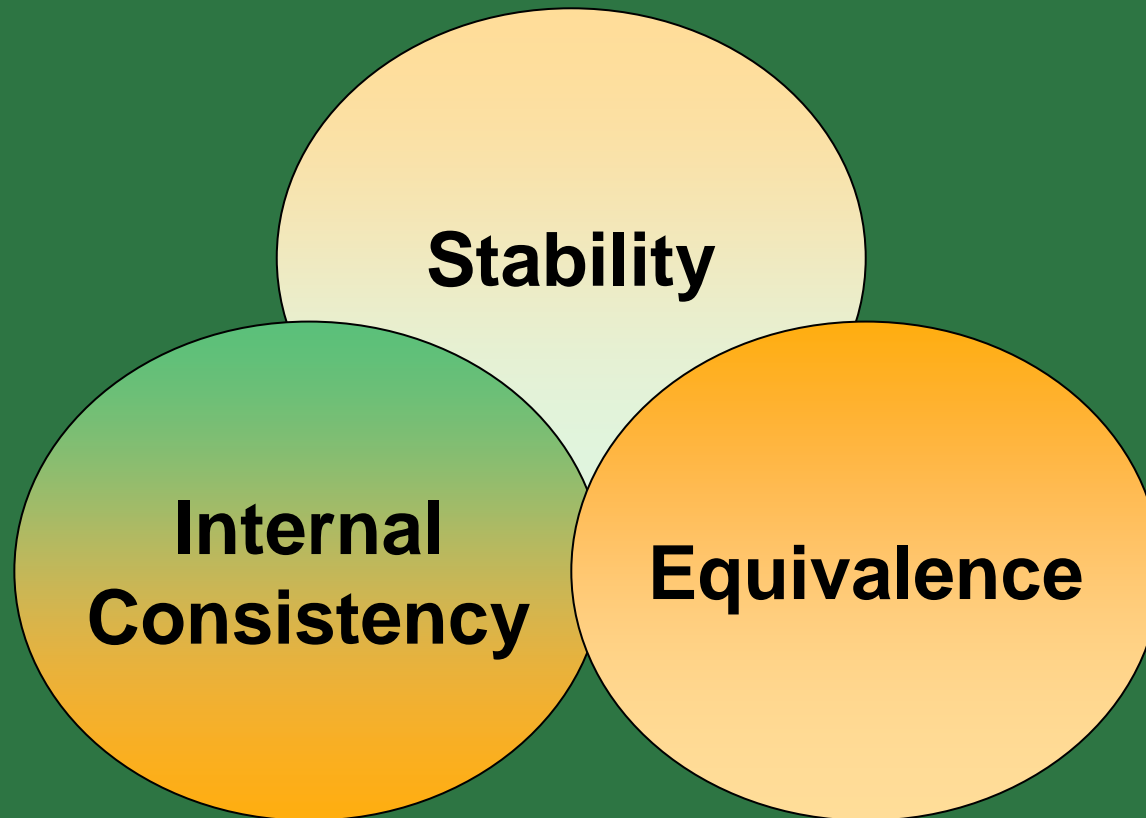
Judging Criterion Validity



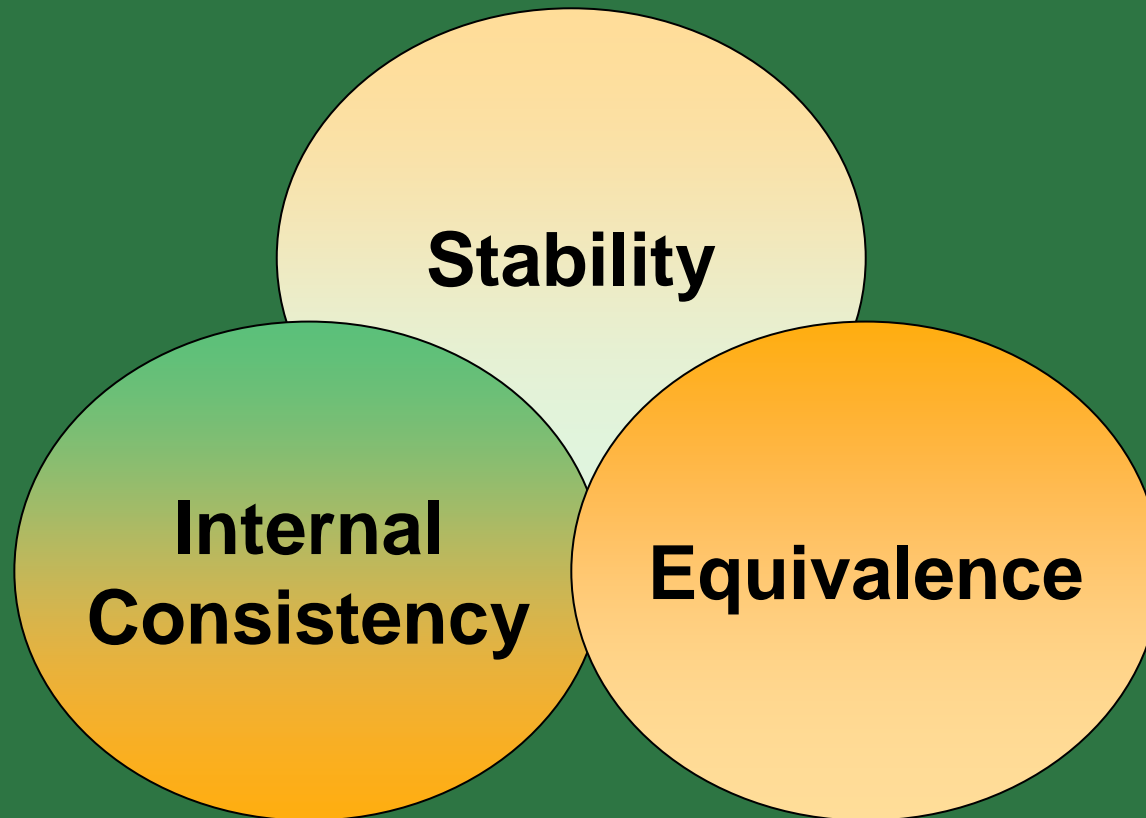
Understanding Validity and Reliability



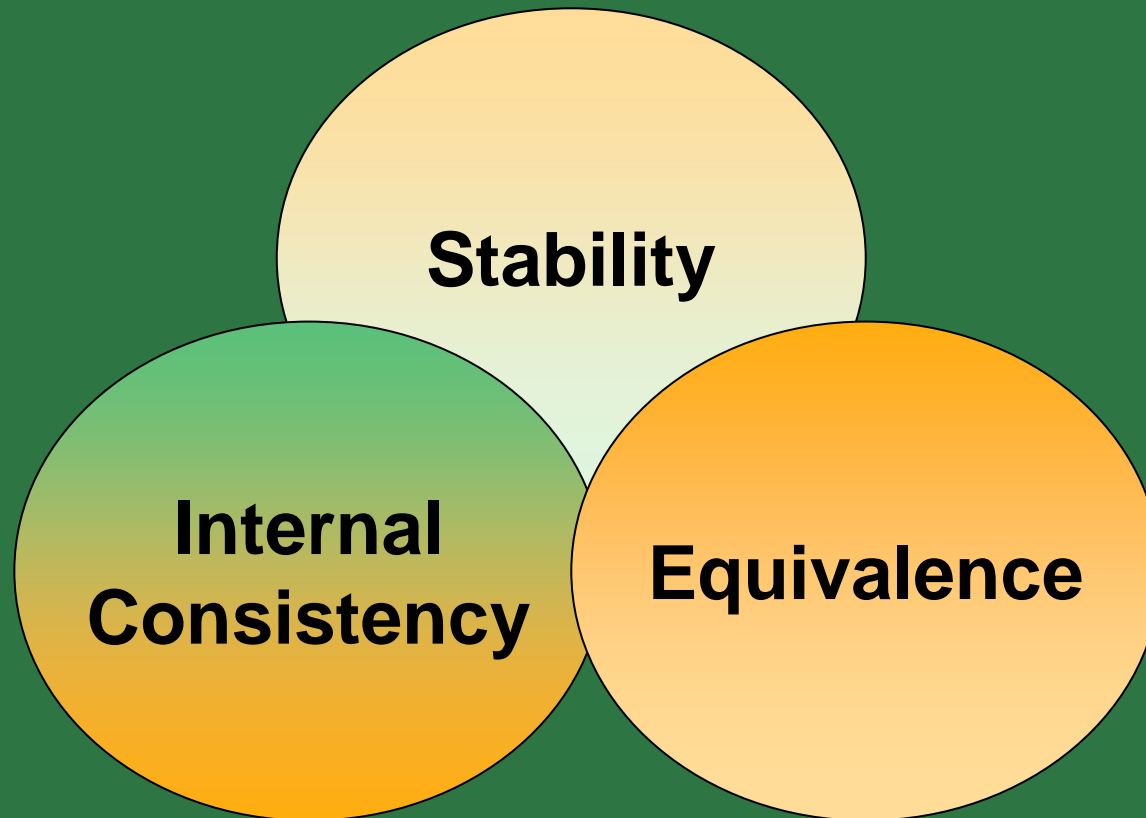
Reliability Estimates



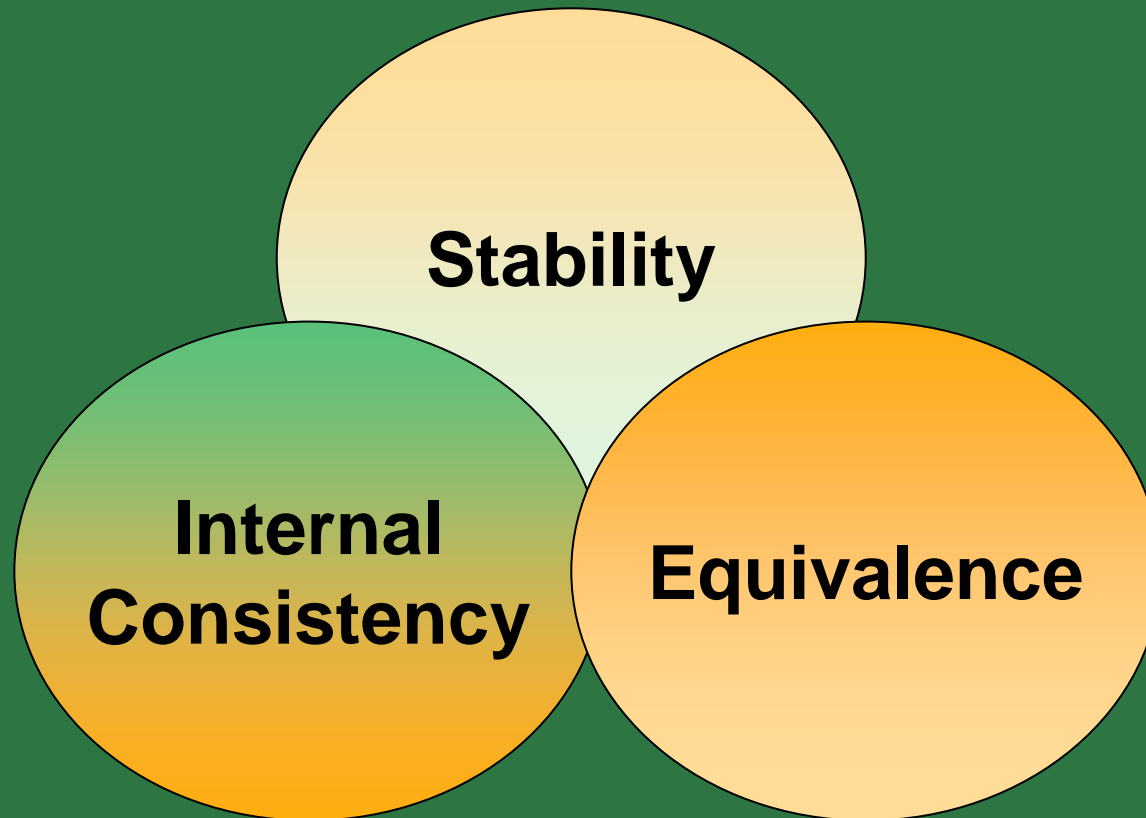
Reliability Estimates



Reliability Estimates



Reliability Estimates




Practicality



Economy

Convenience

Interpretability

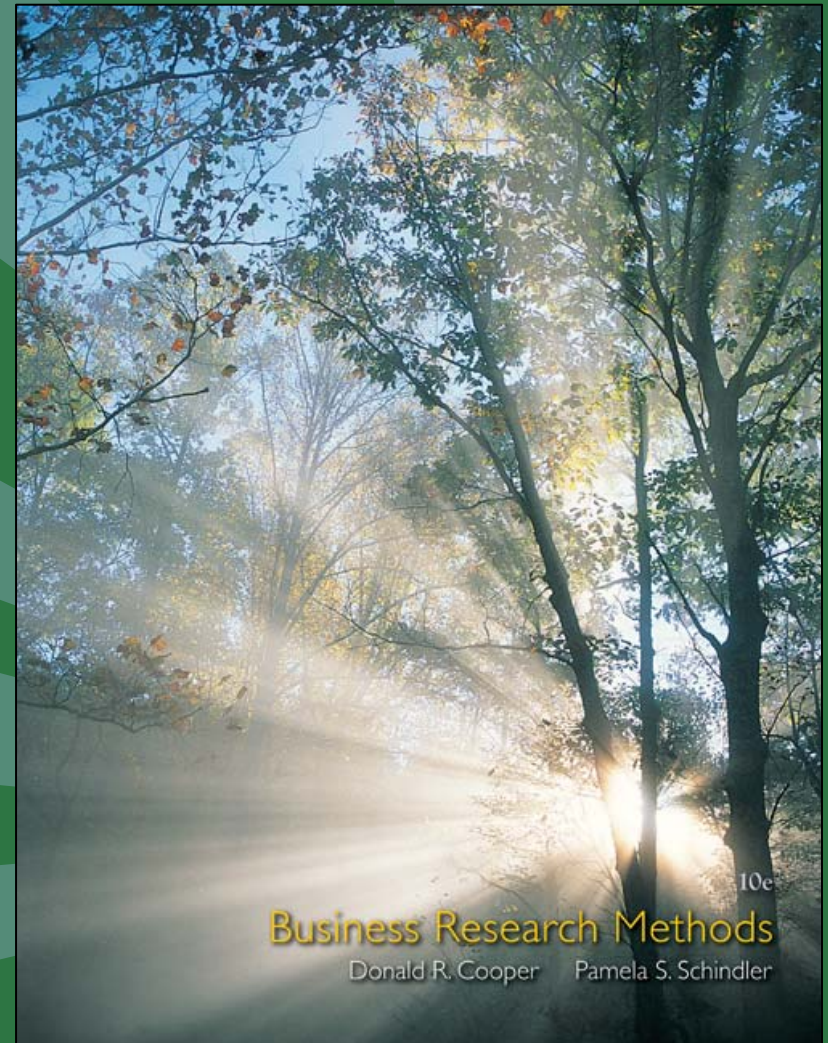



Key Terms

- | | |
|--|--|
| <ul style="list-style-type: none">• Internal validity• Interval scale• Mapping rules• Measurement• Nominal scale• Objects• Ordinal scale• Practicality• Properties | <ul style="list-style-type: none">• Ratio scale• Reliability<ul style="list-style-type: none">– Equivalence– Internal consistency– Stability• Validity<ul style="list-style-type: none">– 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

68

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

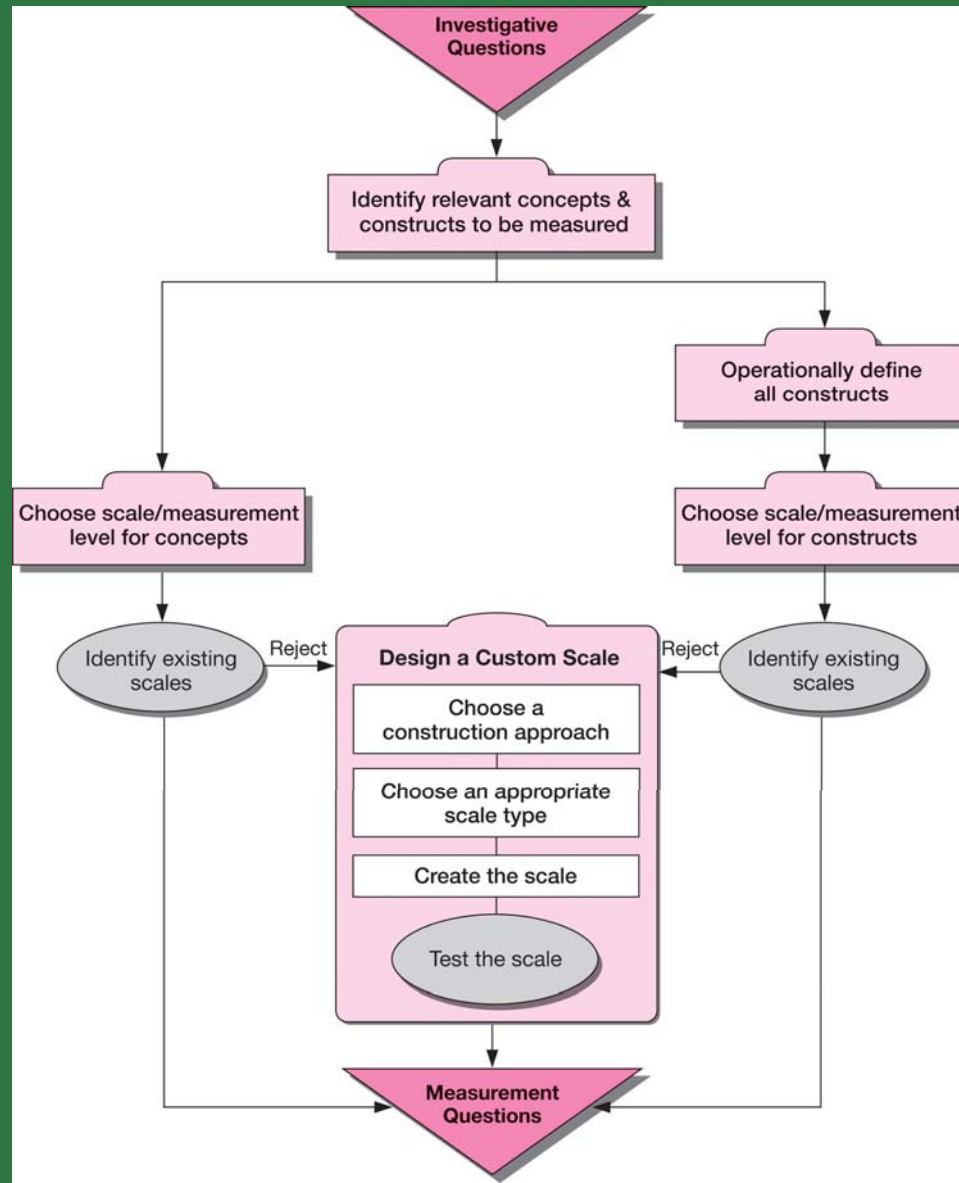


Measurement Scales

“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

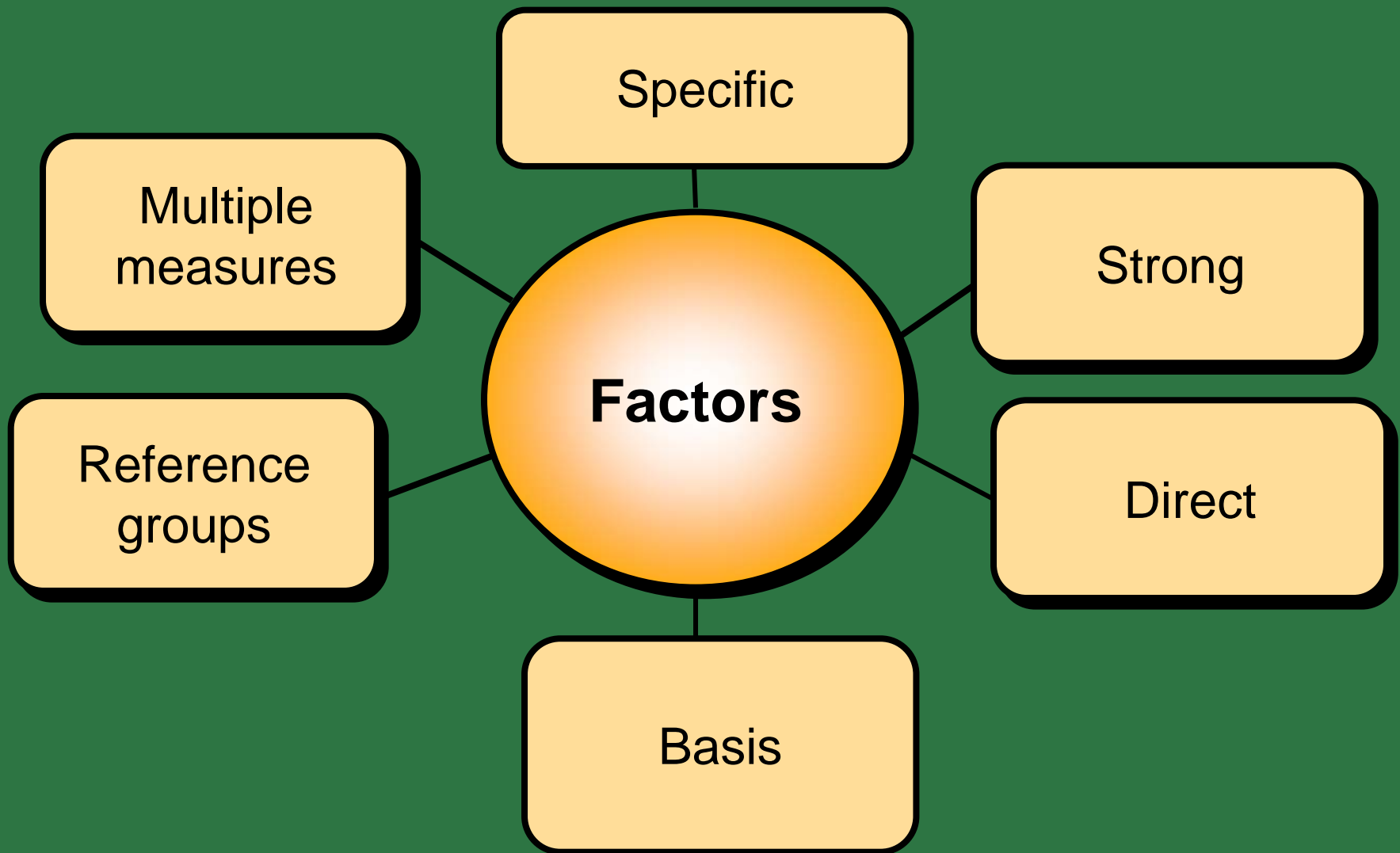
I hate corn flakes.

Behavioral

**I intend to eat more oatmeal
for breakfast.**



Improving Predictability



Selecting a Measurement Scale

Research objectives

Response types

Data properties

**Number of
dimensions**

**Balanced or
unbalanced**

**Forced or unforced
choices**

**Number of
scale points**

Rater errors

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



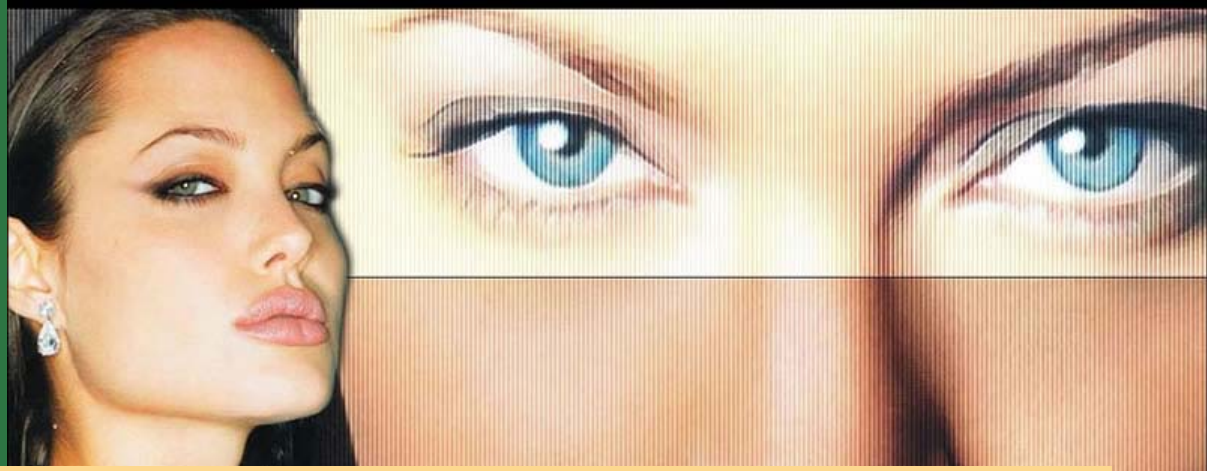
Forced or Unforced Choices

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

The diagram features a large orange rectangle on the left containing the text 'Primacy Effect' and 'Recency Effect'. A large orange arrow points from this rectangle to a light green rounded rectangle on the right. The rounded rectangle contains a bullet point: '•Reverse order of alternatives periodically'.

- 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

[illegible]

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

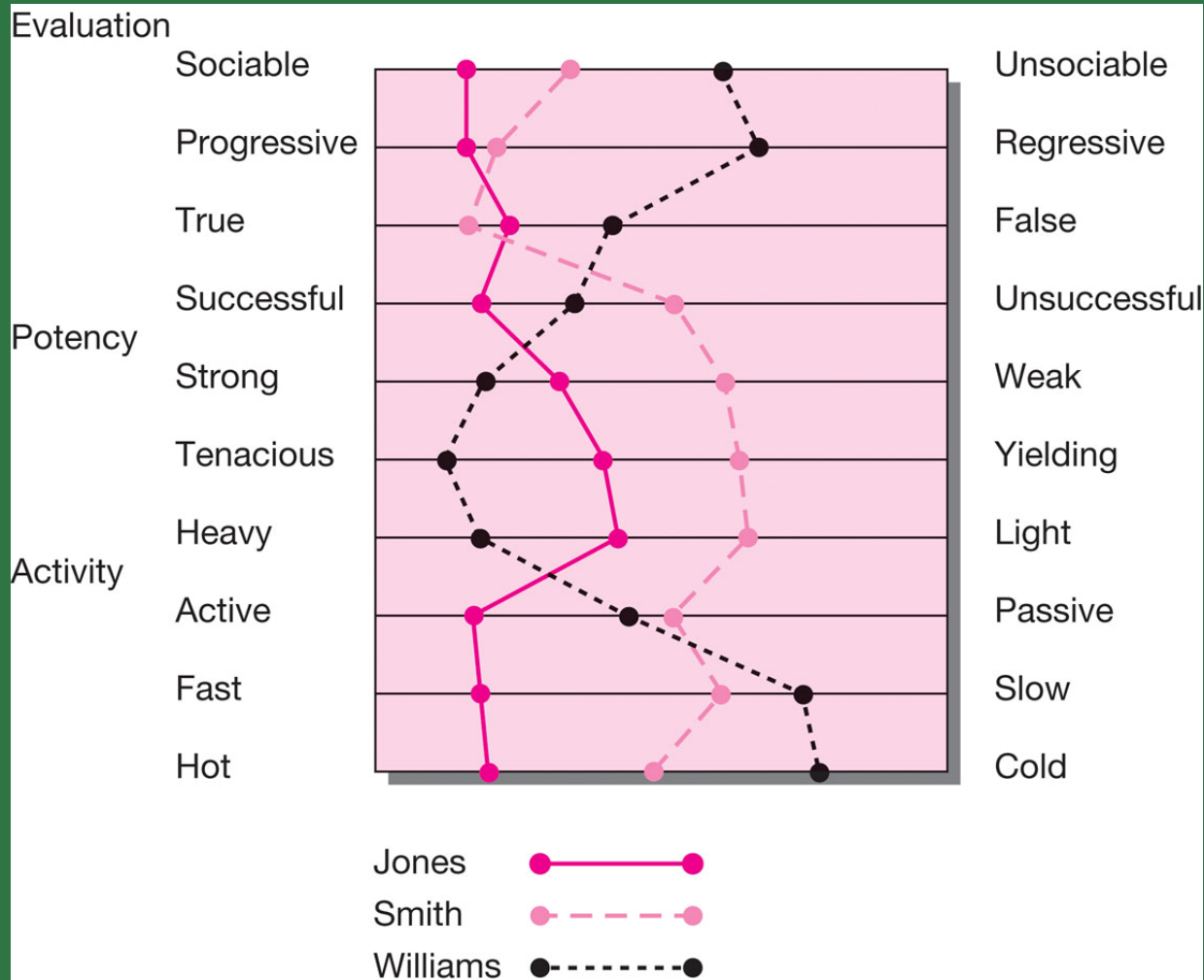
Wide selection of different kinds of products	___: ___: ___: ___: ___: ___: ___:	Limited selection of different kinds of products
Fully stocked	___: ___: ___: ___: ___: ___: ___:	Understocked
Undependable products	___: ___: ___: ___: ___: ___: ___:	Dependable products
High quality	___: ___: ___: ___: ___: ___: ___:	Low quality
Numerous brands	___: ___: ___: ___: ___: ___: ___:	Few brands
Unknown brands	___: ___: ___: ___: ___: ___: ___:	Well-known brands

SD Scale for Analyzing Actor Candidates

Analyze (candidate) for current position:

(E)	Sociable	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	Unsociable
(P)	Weak	(1):	_____:	_____:	_____:	_____:	_____:	_____:	(7)	Strong
(A)	Active	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	Passive
(E)	Progressive	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	Regressive
(P)	Yielding	(1):	_____:	_____:	_____:	_____:	_____:	_____:	(7)	Tenacious
(A)	Slow	(1):	_____:	_____:	_____:	_____:	_____:	_____:	(7)	Fast
(E)	True	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	False
(P)	Heavy	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	Light
(A)	Hot	(7):	_____:	_____:	_____:	_____:	_____:	_____:	(1)	Cold
(E)	Unsuccessful	(1):	_____:	_____:	_____:	_____:	_____:	_____:	(7)	Successful

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
	+4	+4
	+3	+3
	+2	+2
	+1	+1
Technology		World-Class
Leader	Exciting	Reputation
	Products	
	-1	-1
	-2	-2
	-3	-3
	-4	-4
	-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 100

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

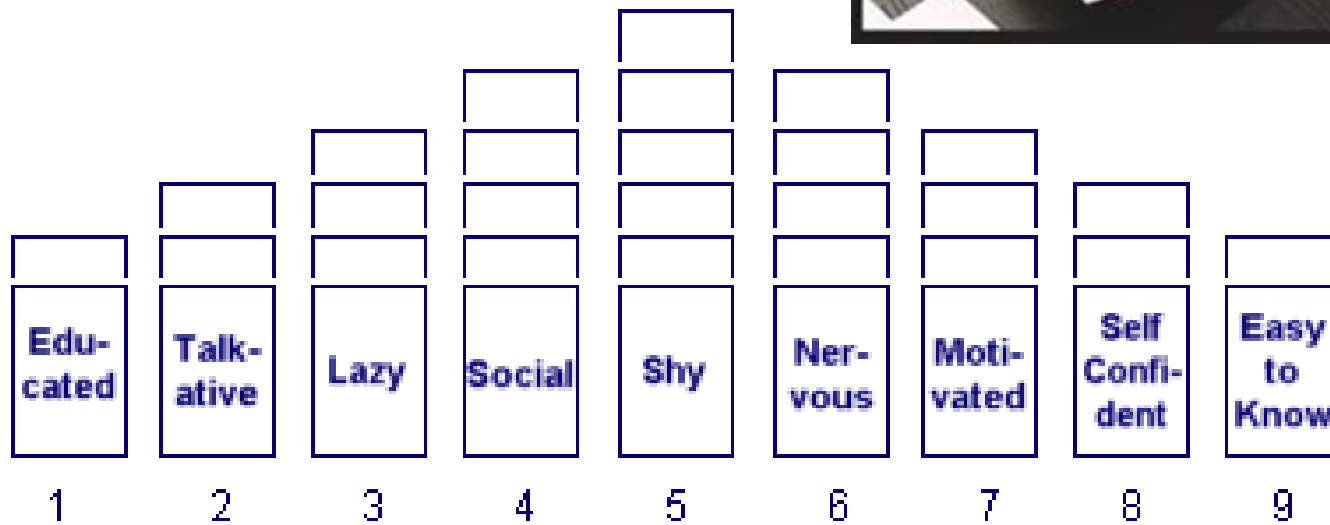
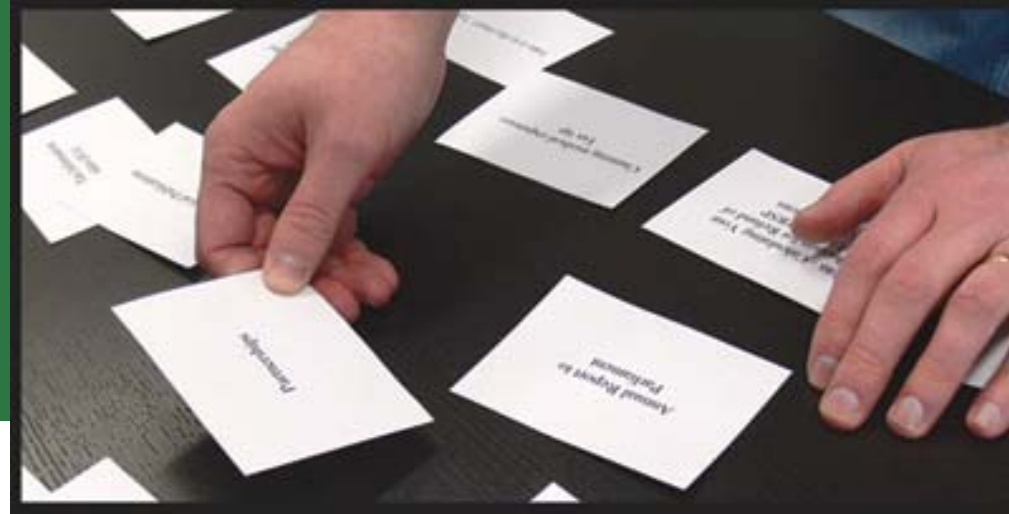
2

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					Participant Score
2	4	1	3		
X	X	X	X	4	
—	X	X	X	3	
—	—	X	X	2	
—	—	—	X	1	
—	—	—	—	0	
* X = agree; — = disagree.					




Key Terms

- | | |
|---|--|
| <ul style="list-style-type: none">• Attitude• Balanced rating scale• Categorization• Comparative scale• Constant-sum scale• Cumulative scale• Error of central tendency• Error of leniency | <ul style="list-style-type: none">• Forced-choice rating scale• Forced ranking scale• Graphic rating scale• Halo effect• Item analysis• Likert scale• Multidimensional scale |
|---|--|



Key Terms

- | | |
|--|--|
| <ul style="list-style-type: none">• Multiple-choice, multiple-response scale• Multiple-choice, single-response scale• Multiple rating list• Numerical scale• Paired-comparison scale | <ul style="list-style-type: none">• Q-sort• Ranking scale• Rating scale• Scaling• Scalogram analysis• Semantic differential• Simple category scale |
|--|--|

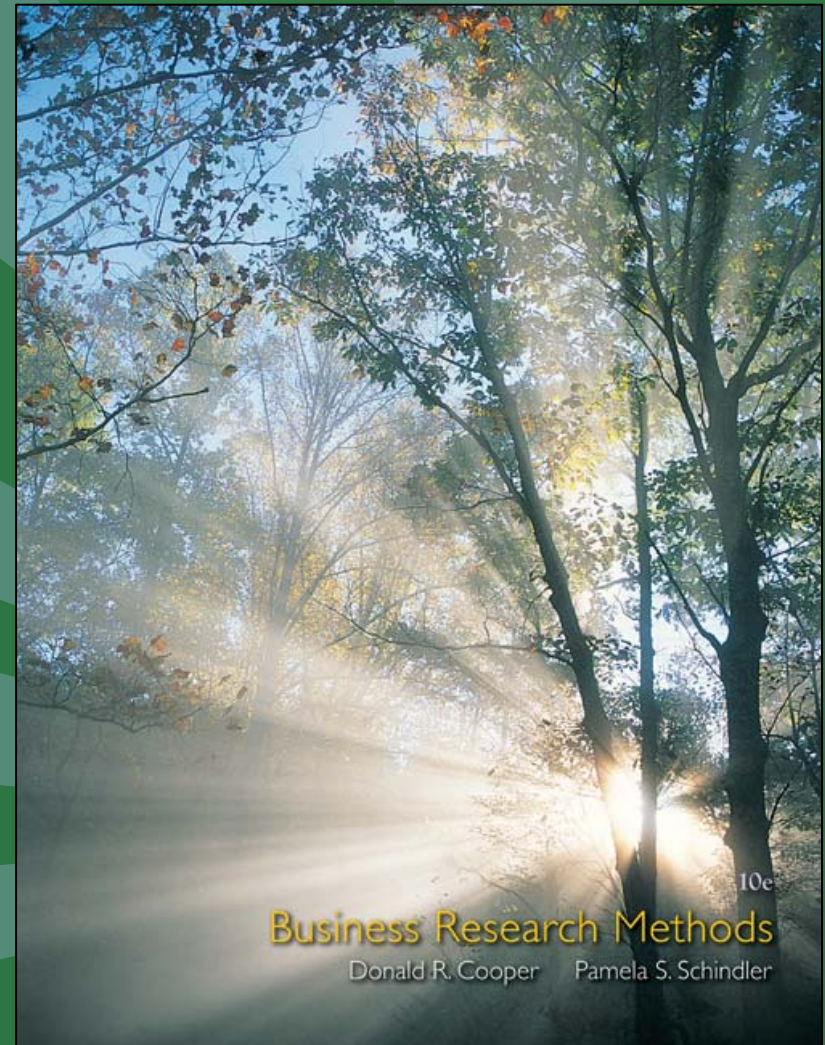



Key Terms

- | | |
|--|---|
| <ul style="list-style-type: none">• Sorting• Stapel scale• Summated rating scale | <ul style="list-style-type: none">• 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

66

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

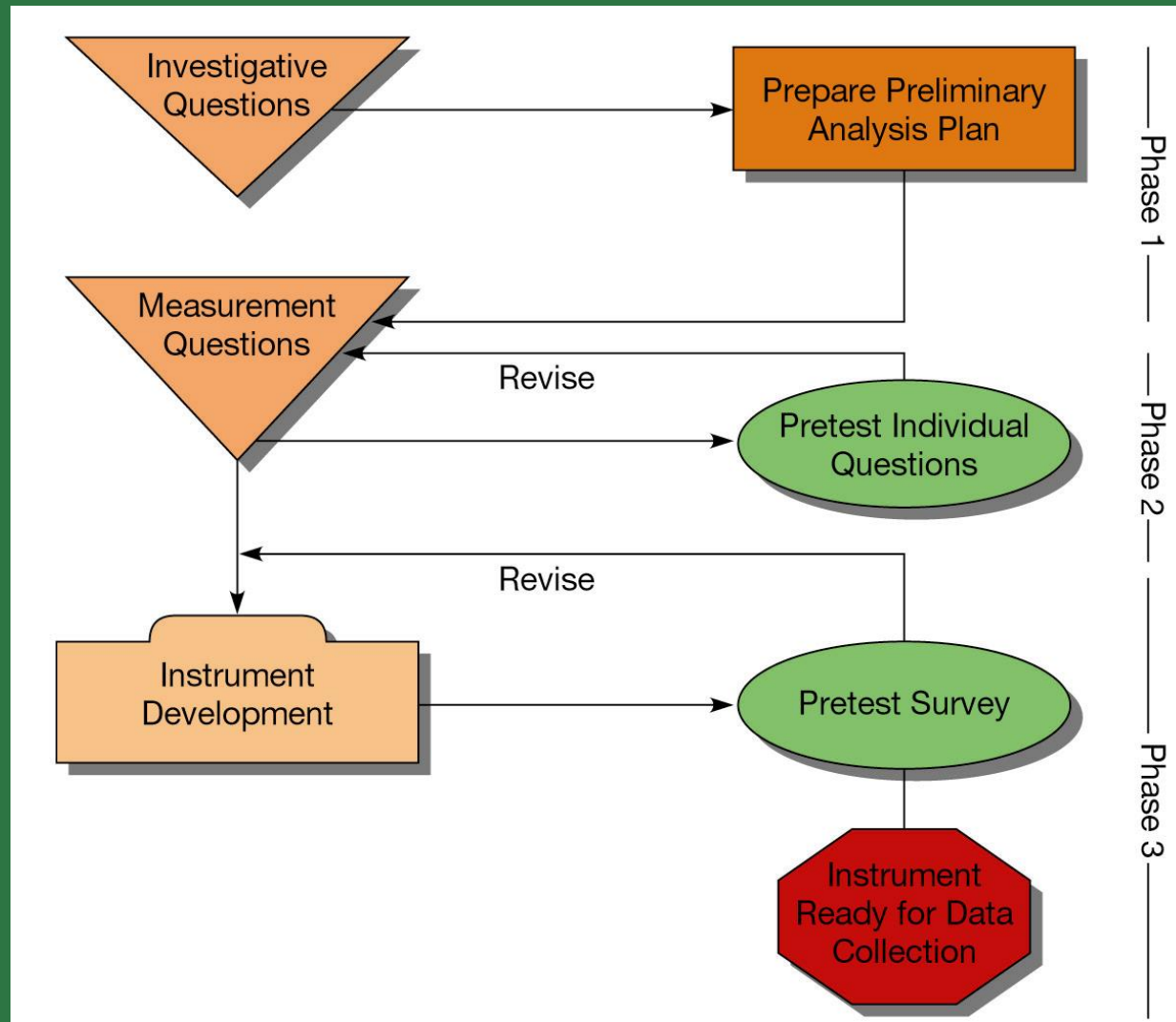


Measurement Scales

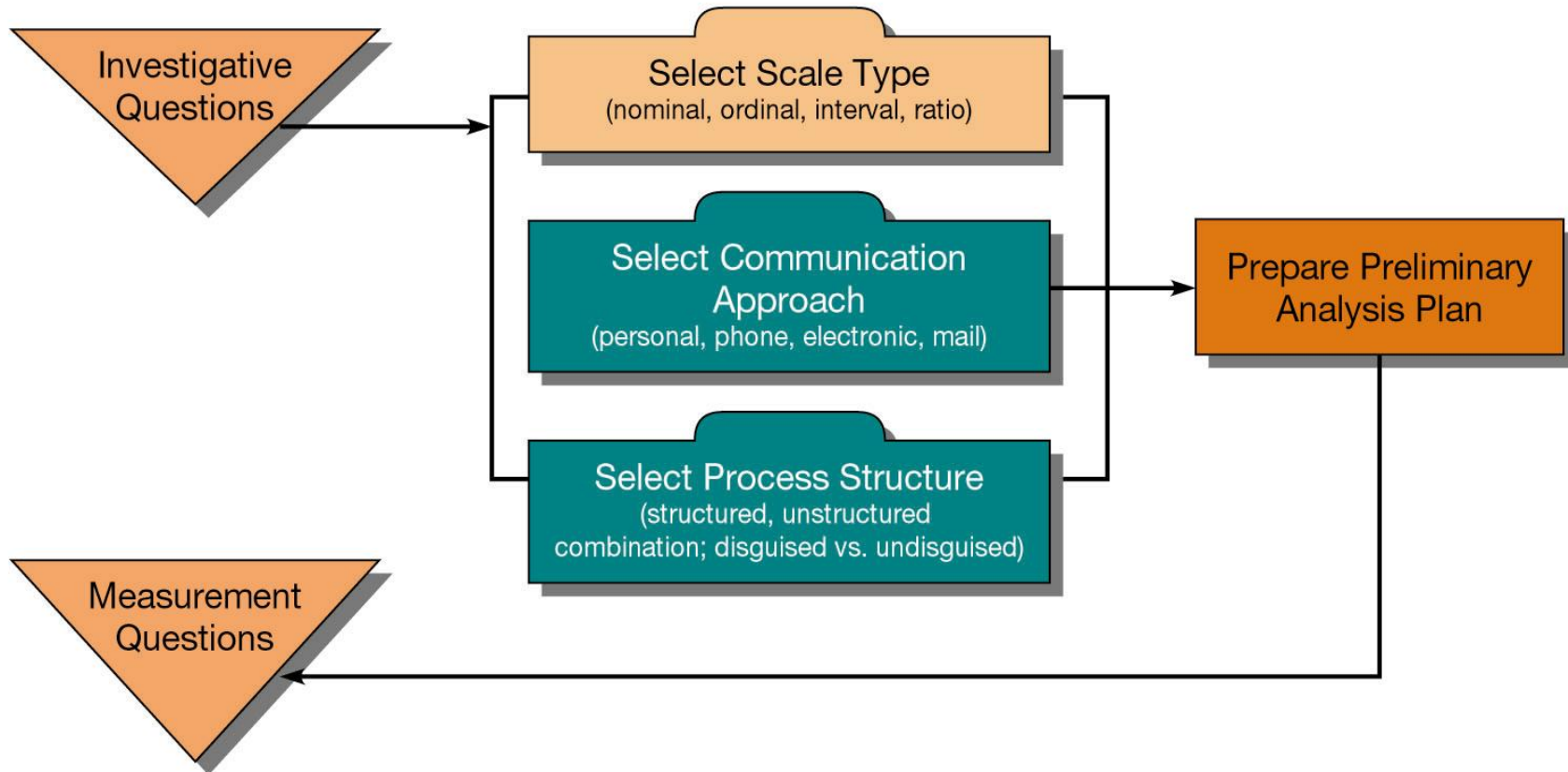
“Participants are becoming more and more aware of the value of their time. The key to maintaining a quality dialog with them is to make it really convenient for them to engage, whenever and wherever they want.”


**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?

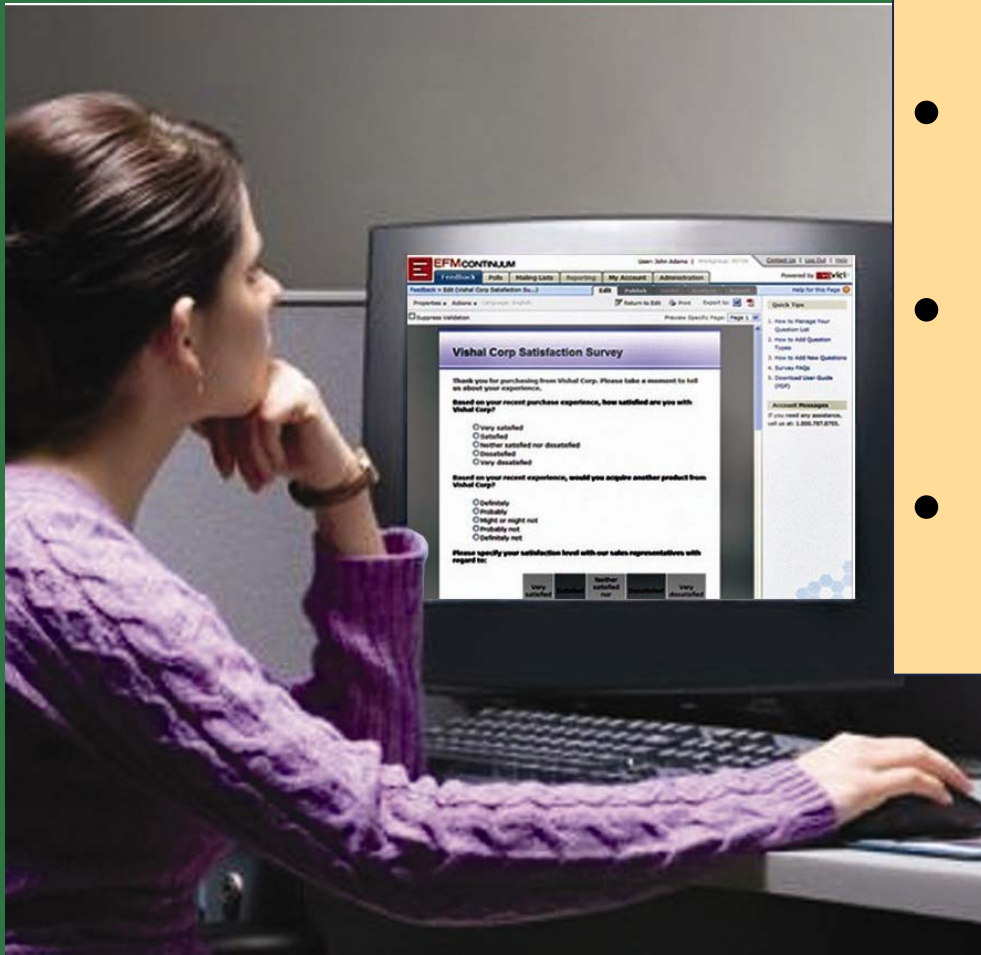
What communication approach will be used?

Should the questions be structured?

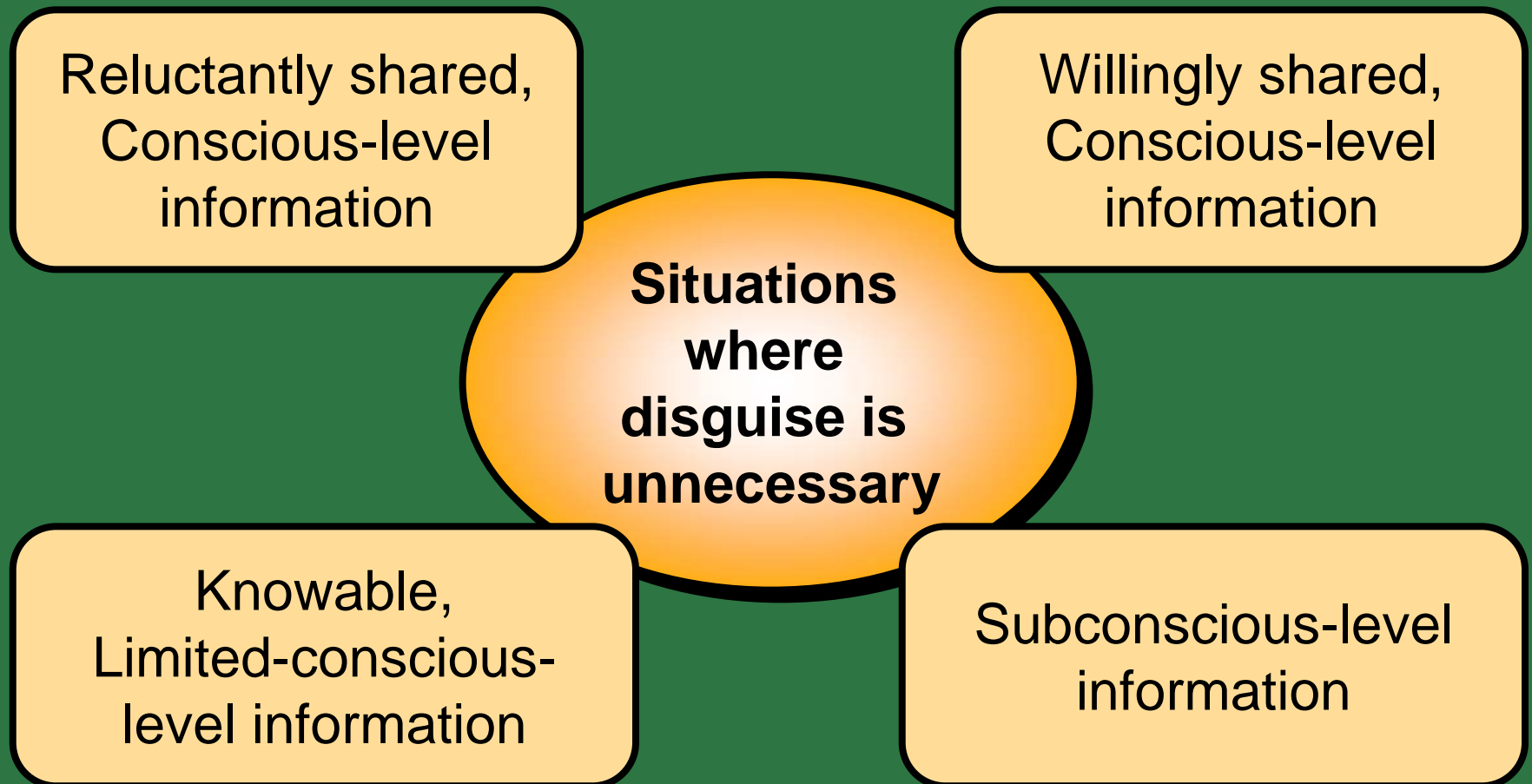
Should the questioning be disguised?

Technology Affects Questionnaire Development

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



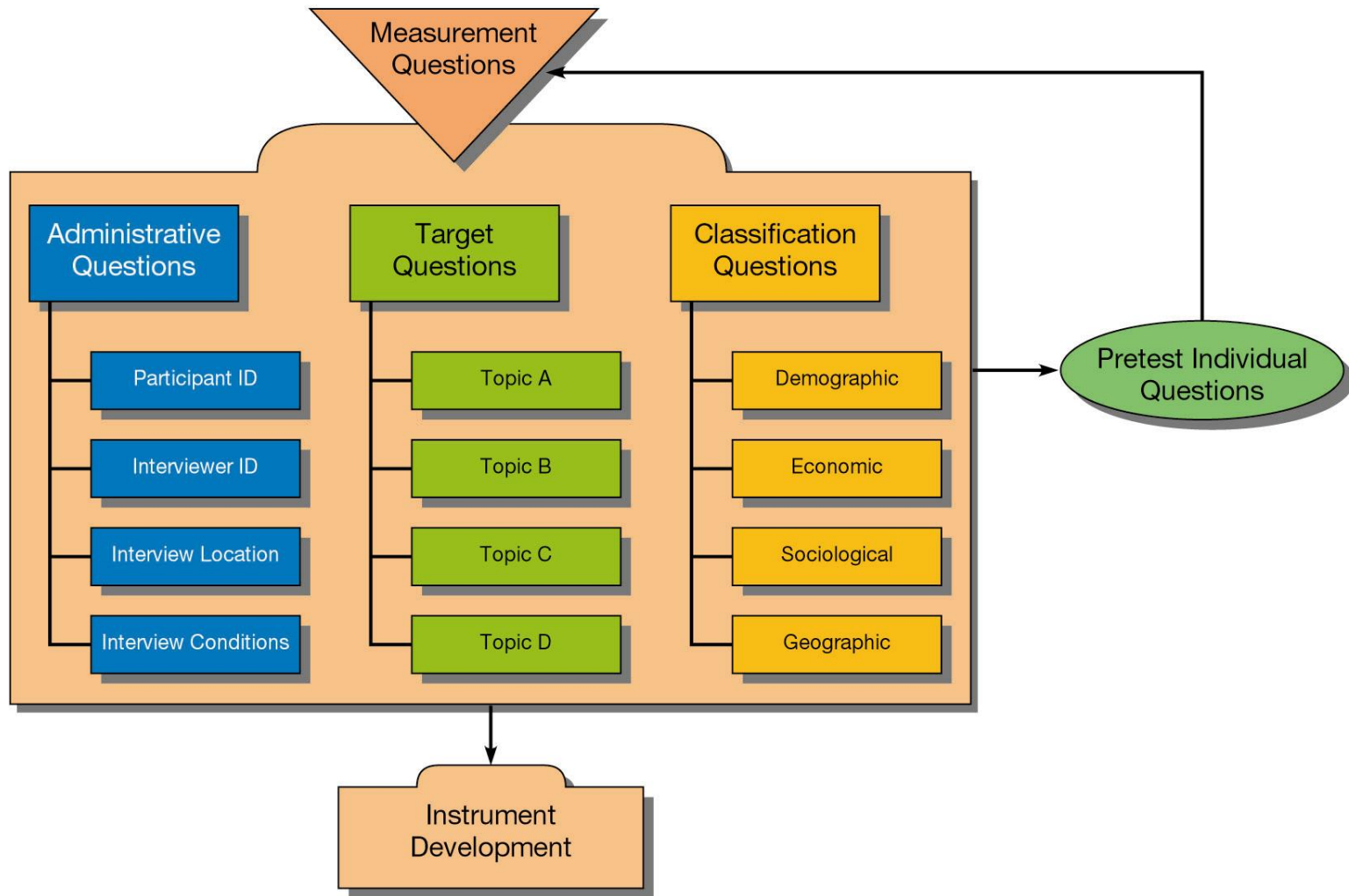
Disguising Study Objectives



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



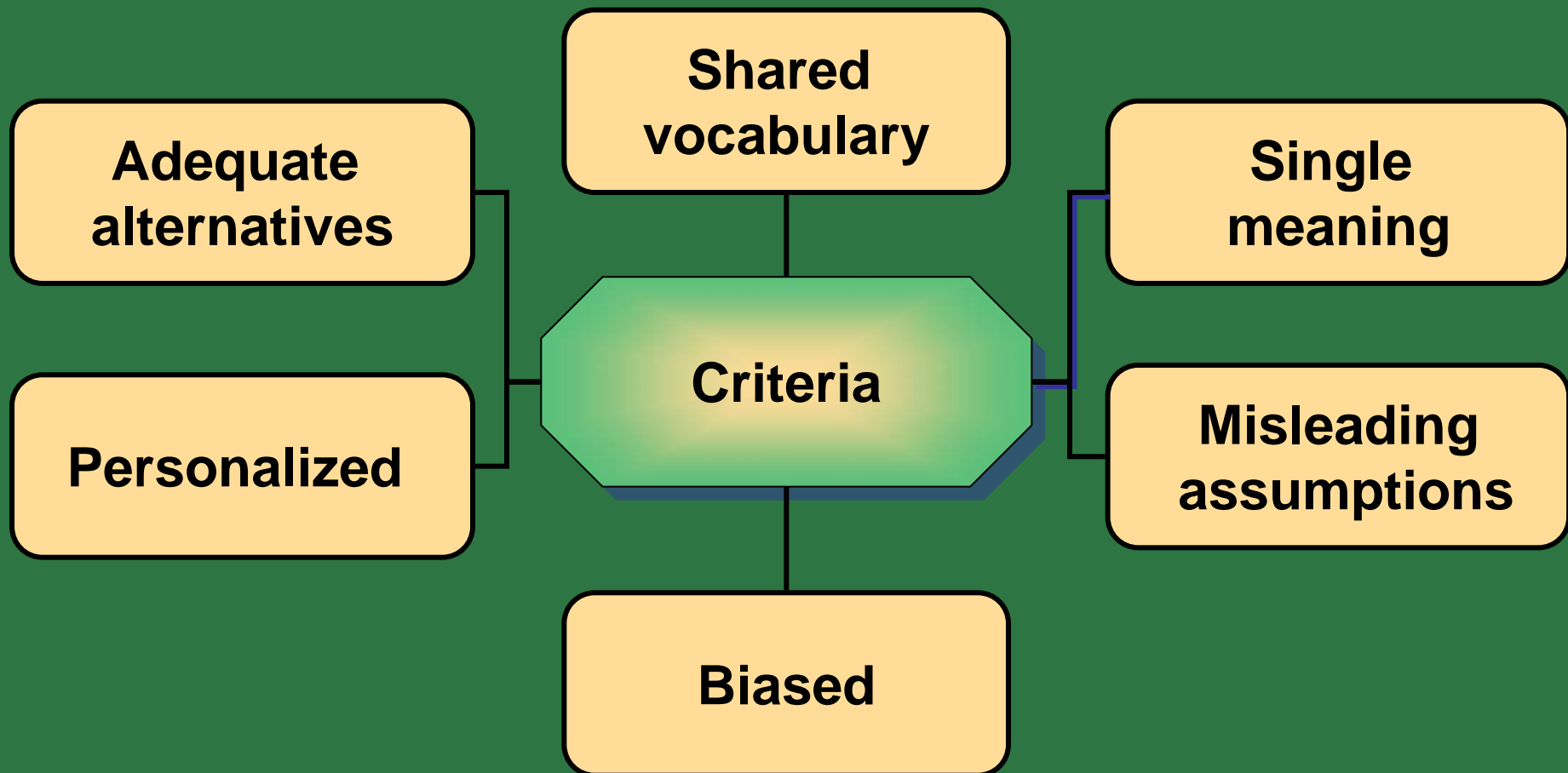
Should this question be asked?

Is the question of proper scope and coverage?

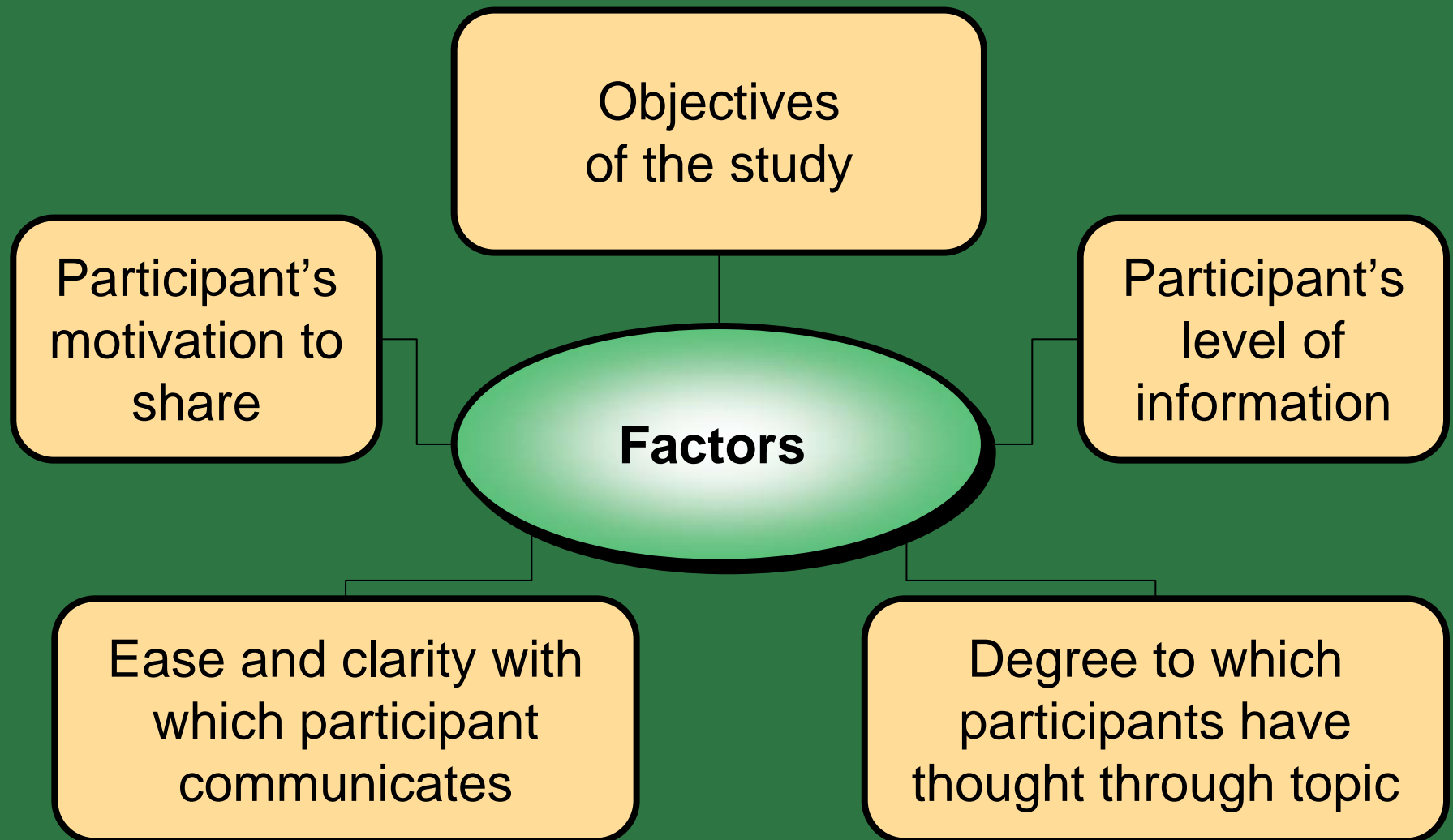
**Can the participant adequately
answer this question as asked?**

**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"/>	<input type="radio"/>
Service at my location	<input type="radio"/>	<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"/>	<input type="radio"/>
Knowledgeable technicians	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Notification of upgrades	<input type="radio"/>	<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

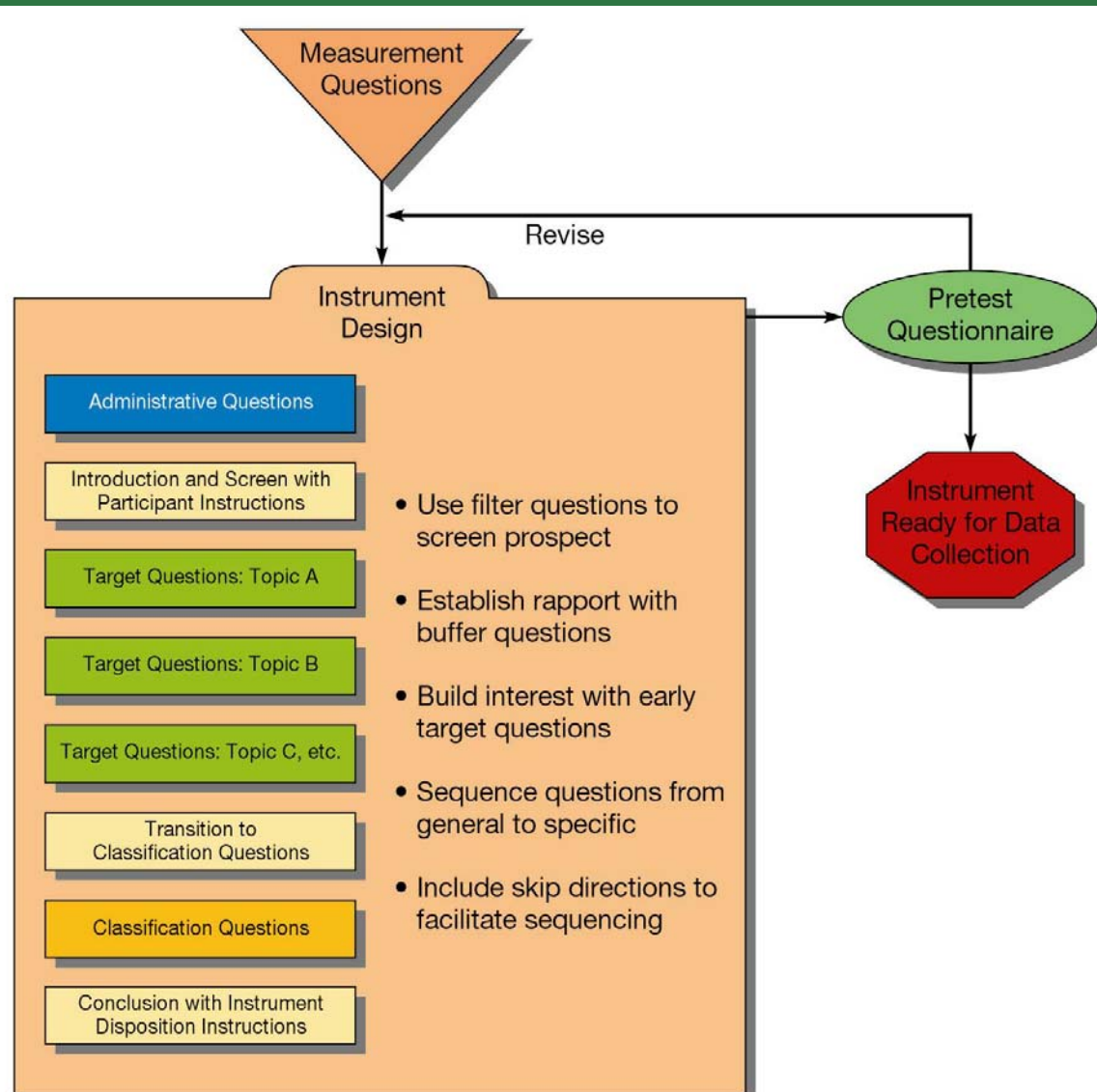
Fast reliable repair service	— v
Service at my location	—
Maintenance by the manufacturer	1
Knowledgeable technicians	2
Notification of upgrades	3



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?

13-33

Branching Question

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

Next Question

- [illegible]

[illegible]

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 1	Met some expectations 2	Met most expectations 3	Met all expectations 4	Exceeded expectations 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

- | | |
|--|---|
| <ul style="list-style-type: none">• Administrative question• Branched question• Buffer question• Checklist• Classification question• Dichotomous question | <ul style="list-style-type: none">• Disguised question• Double-barreled question• Free-response question• Interview schedule• Leading question• Multiple-choice question |
|--|---|

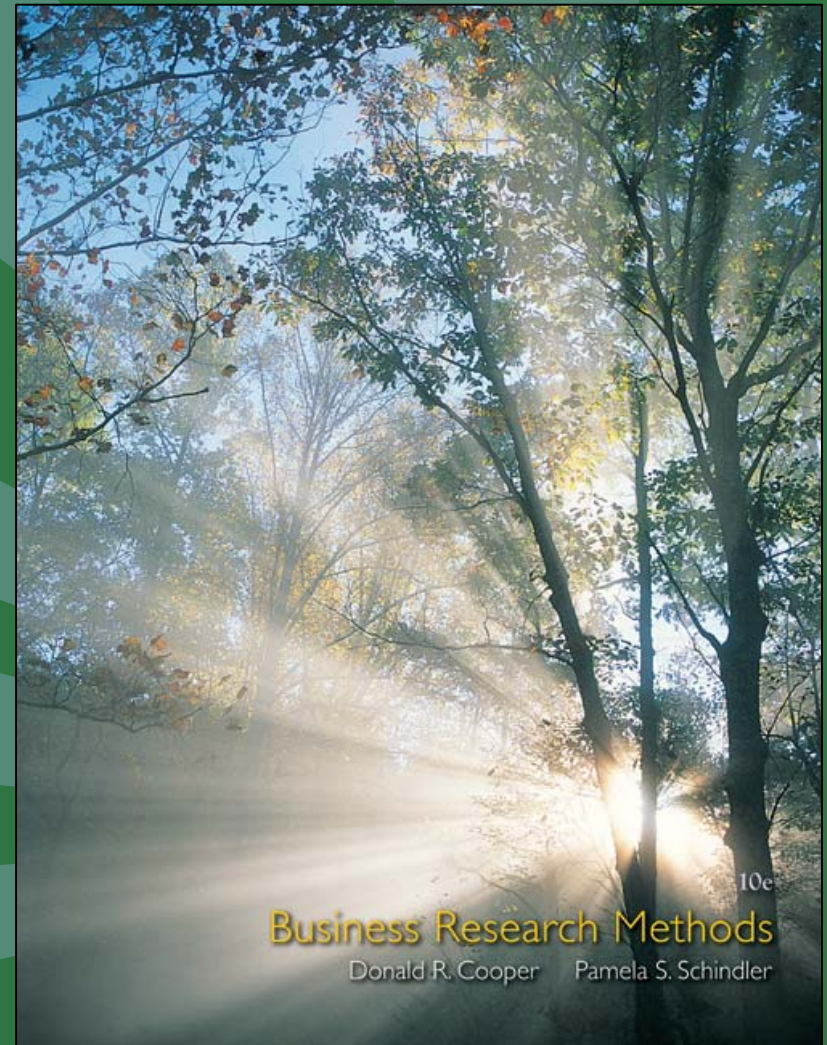



Key Terms

- 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

43

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



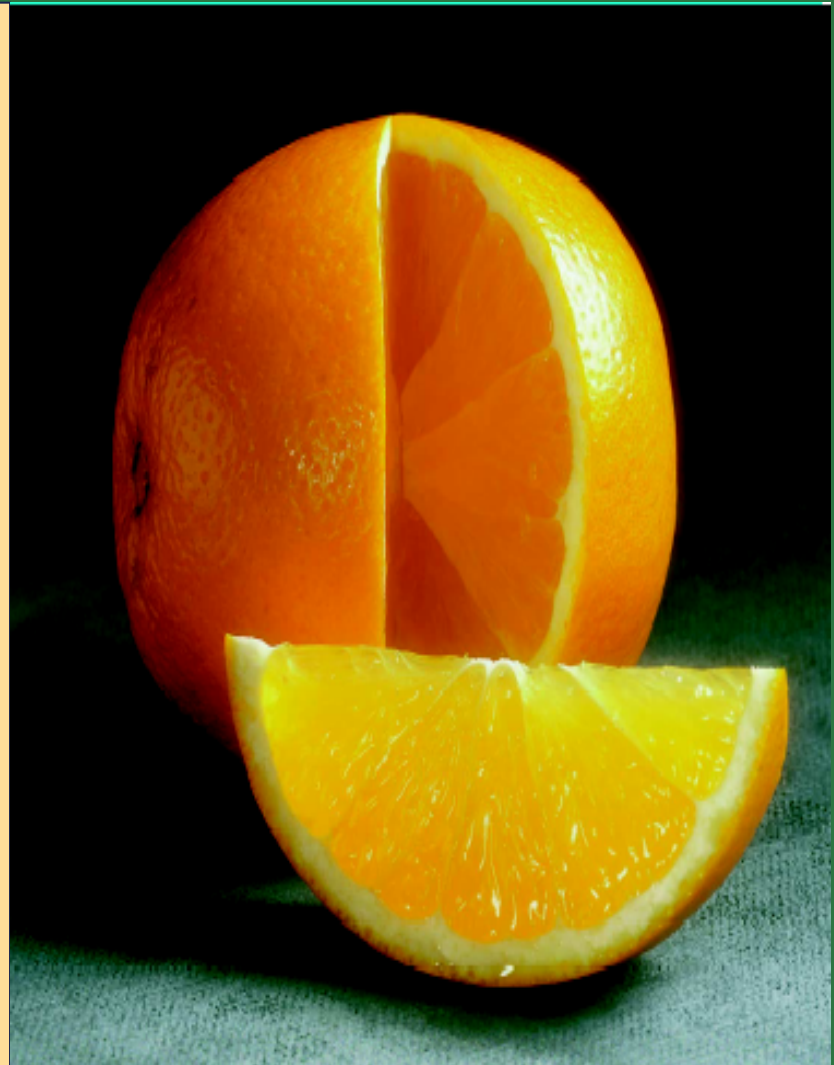
What Is a Sufficiently Large Sample?

“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?



The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst are two side-by-side hexagonal shapes. The left hexagon is light orange and contains the word 'Feasible'. The right hexagon is a darker orange and contains the word 'Necessary'.

Feasible

Necessary

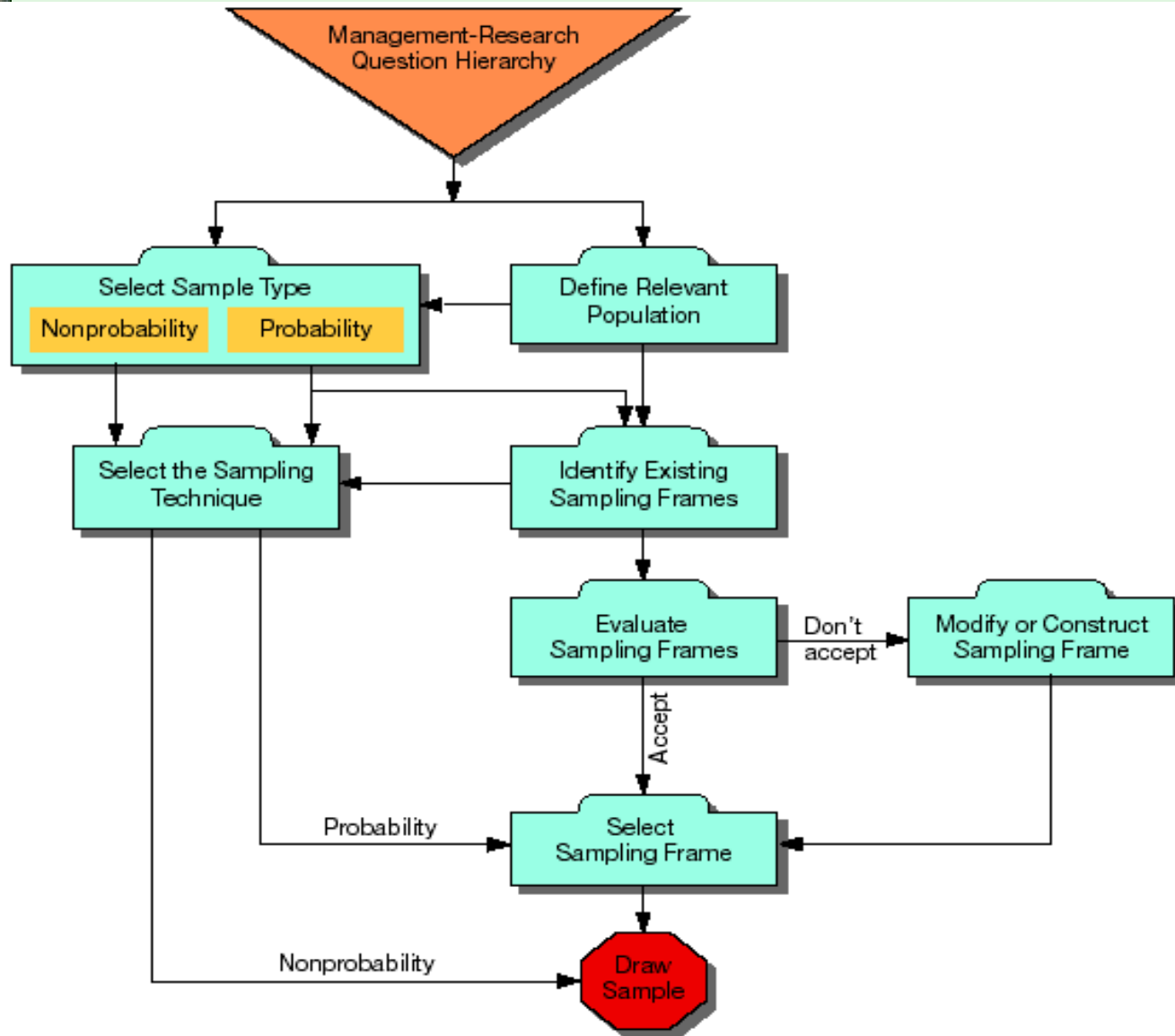
What Is a Valid Sample?

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?

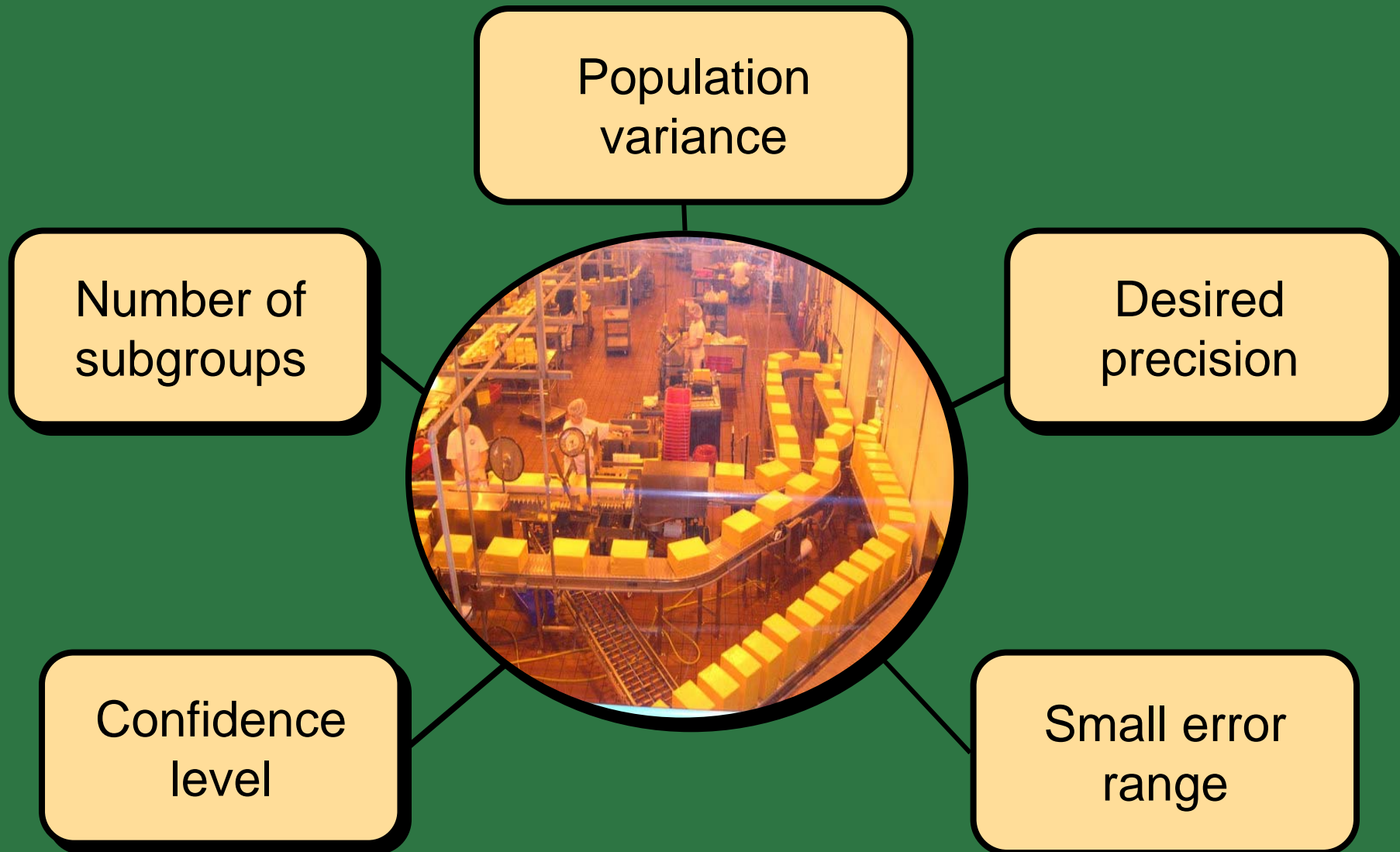
What are the parameters of interest?

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

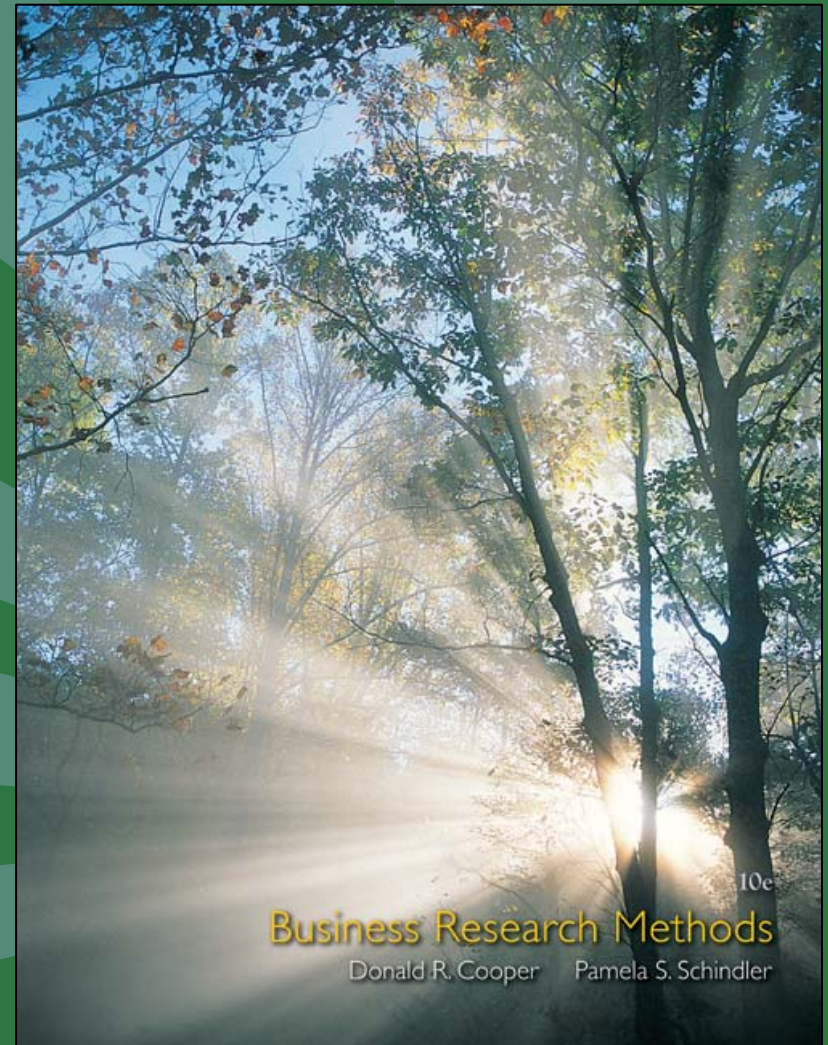


Key Terms

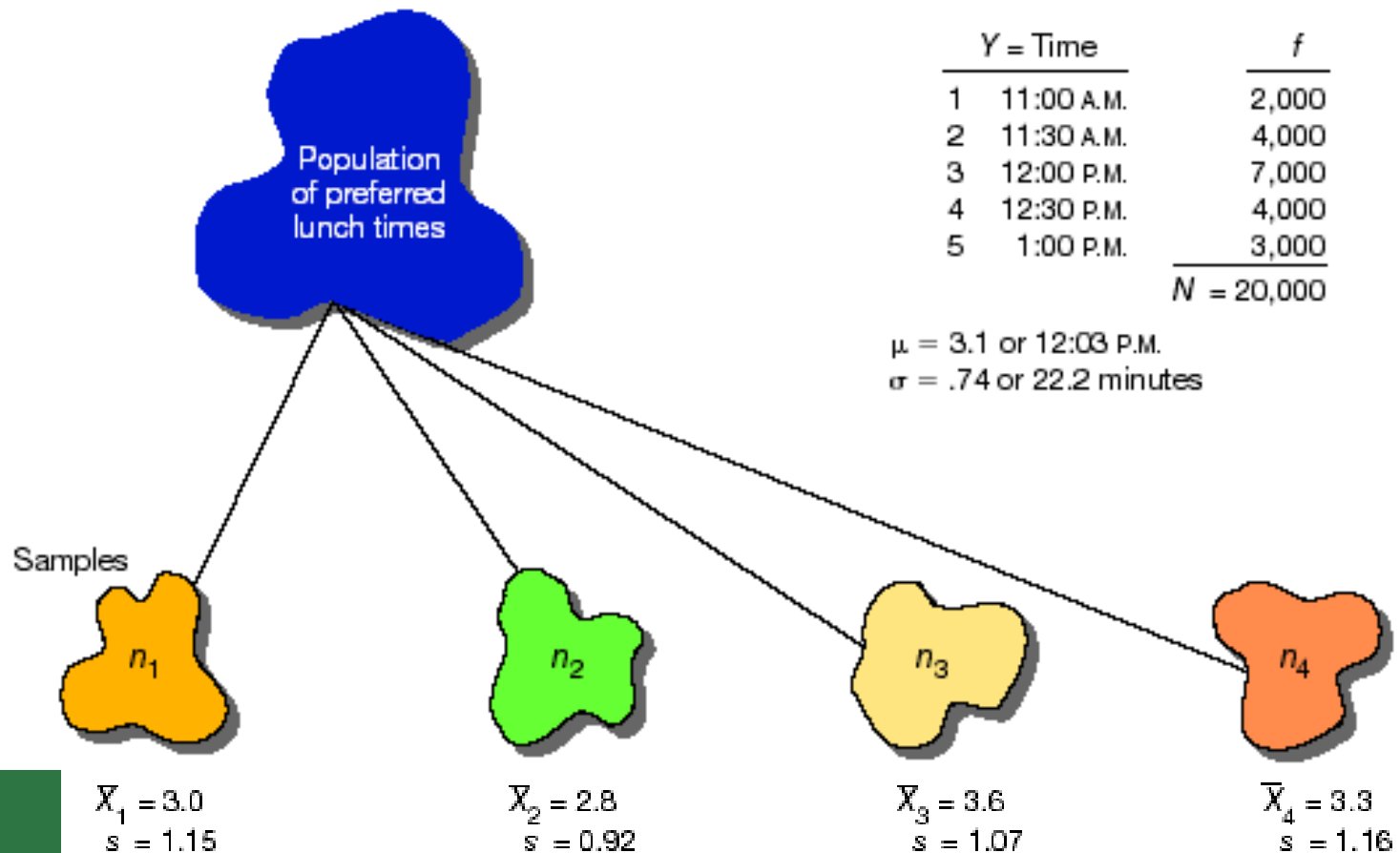
- Proportionate stratified sampling
- Quota sampling
- Sample statistics
- Sampling
- Sampling error
- Sampling frame
- Sequential sampling
- Simple random sample
- Skip interval
- Snowball sampling
- Stratified random sampling
- Systematic sampling
- Systematic variance

Appendix 14a

Determining Sample Size



Random Samples



Increasing Precision

Reducing the Standard Deviation by 50%

Quadrupling the Sample

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

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

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

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

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

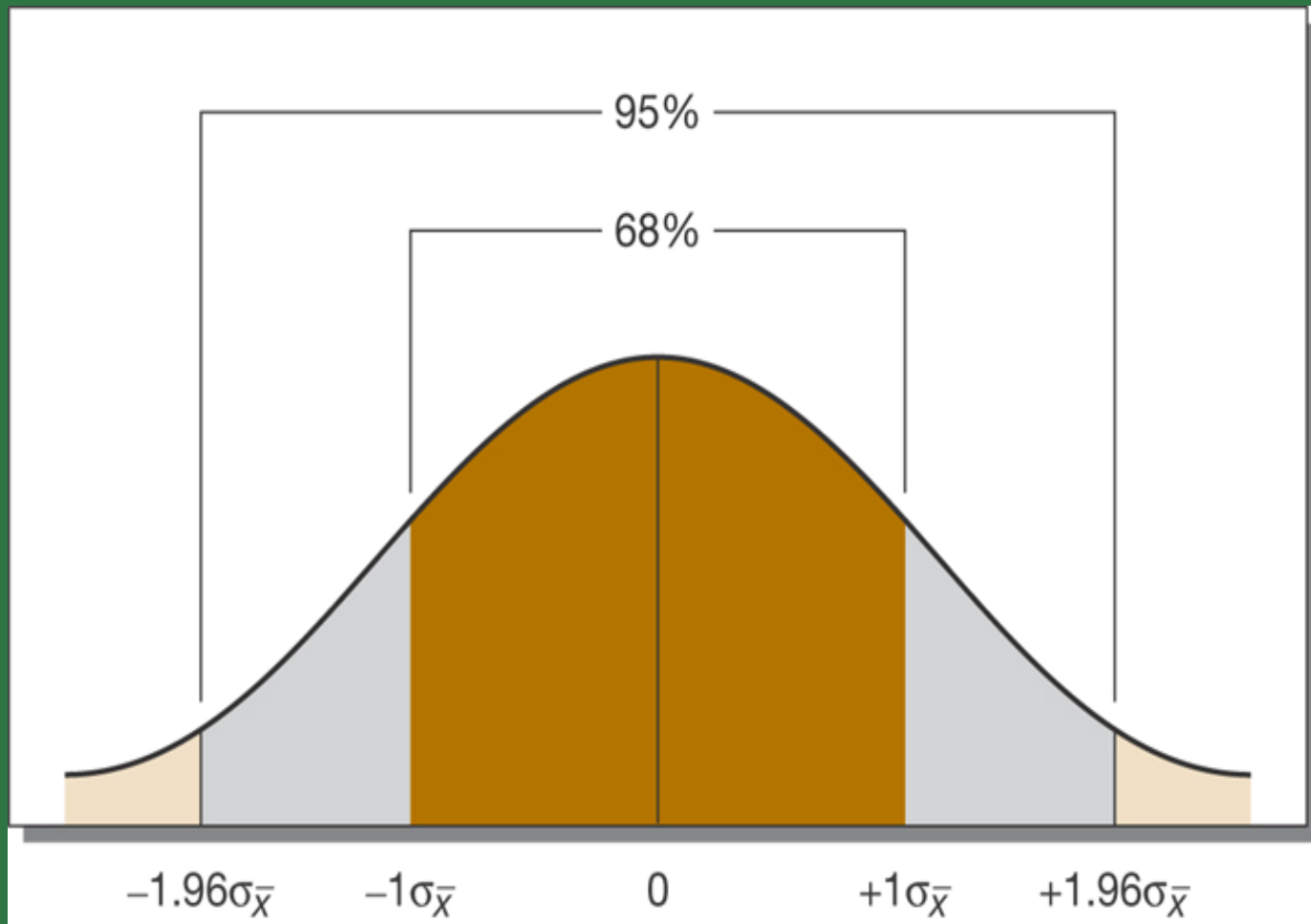
where

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

s = standard deviation of the sample

n = sample size

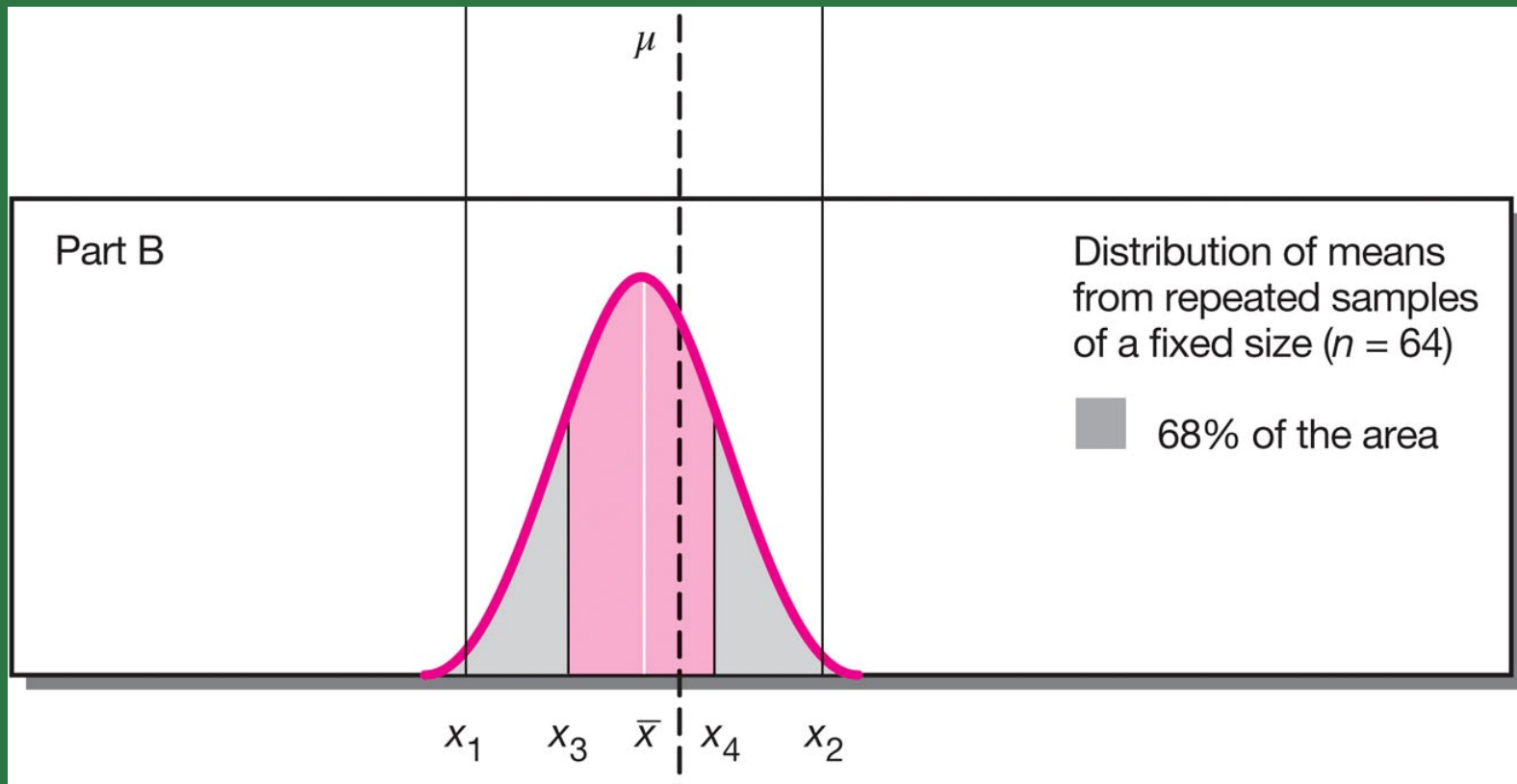
Confidence Levels & the Normal Curve



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

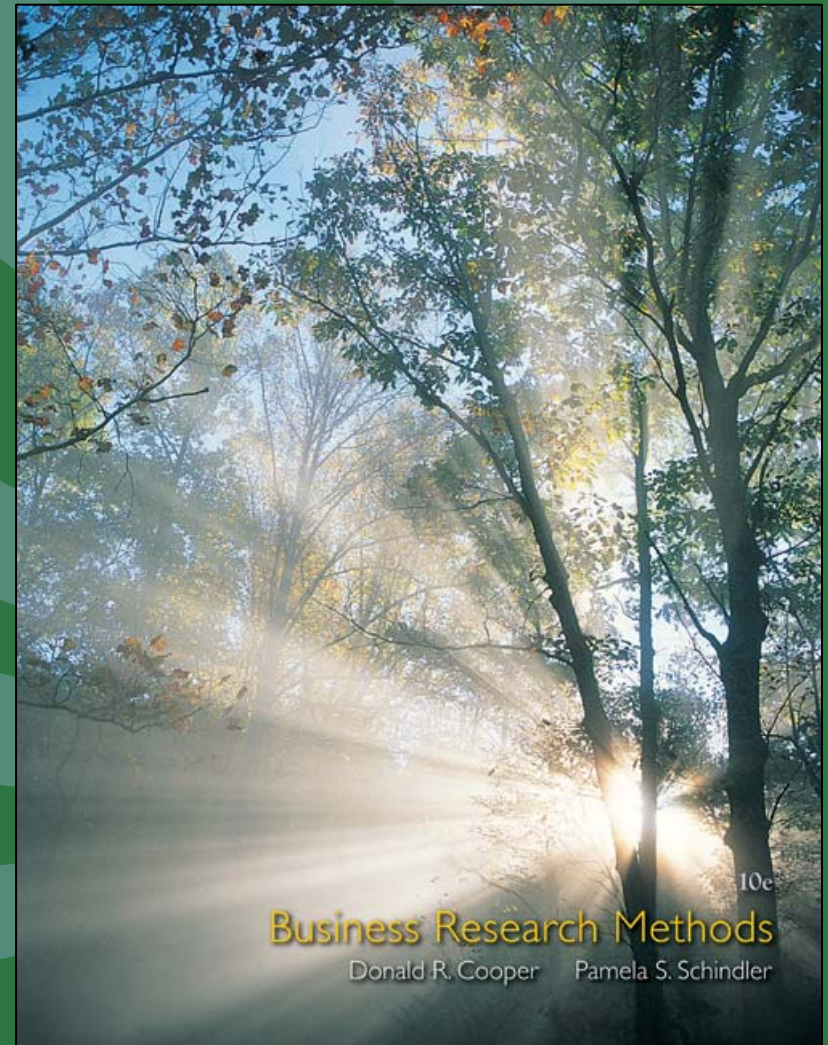
Steps	Information
Desired confidence level	95% ($z = 1.96$)
Size of the interval estimate	$\pm .10$ (10%)
Expected range in population	0 to 100%
Sample proportion with given attribute	30%
Sample dispersion	$Pq = .30(1-.30) = .21$
Finite population adjustment	No
Standard error of the proportion	$.10/1.96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



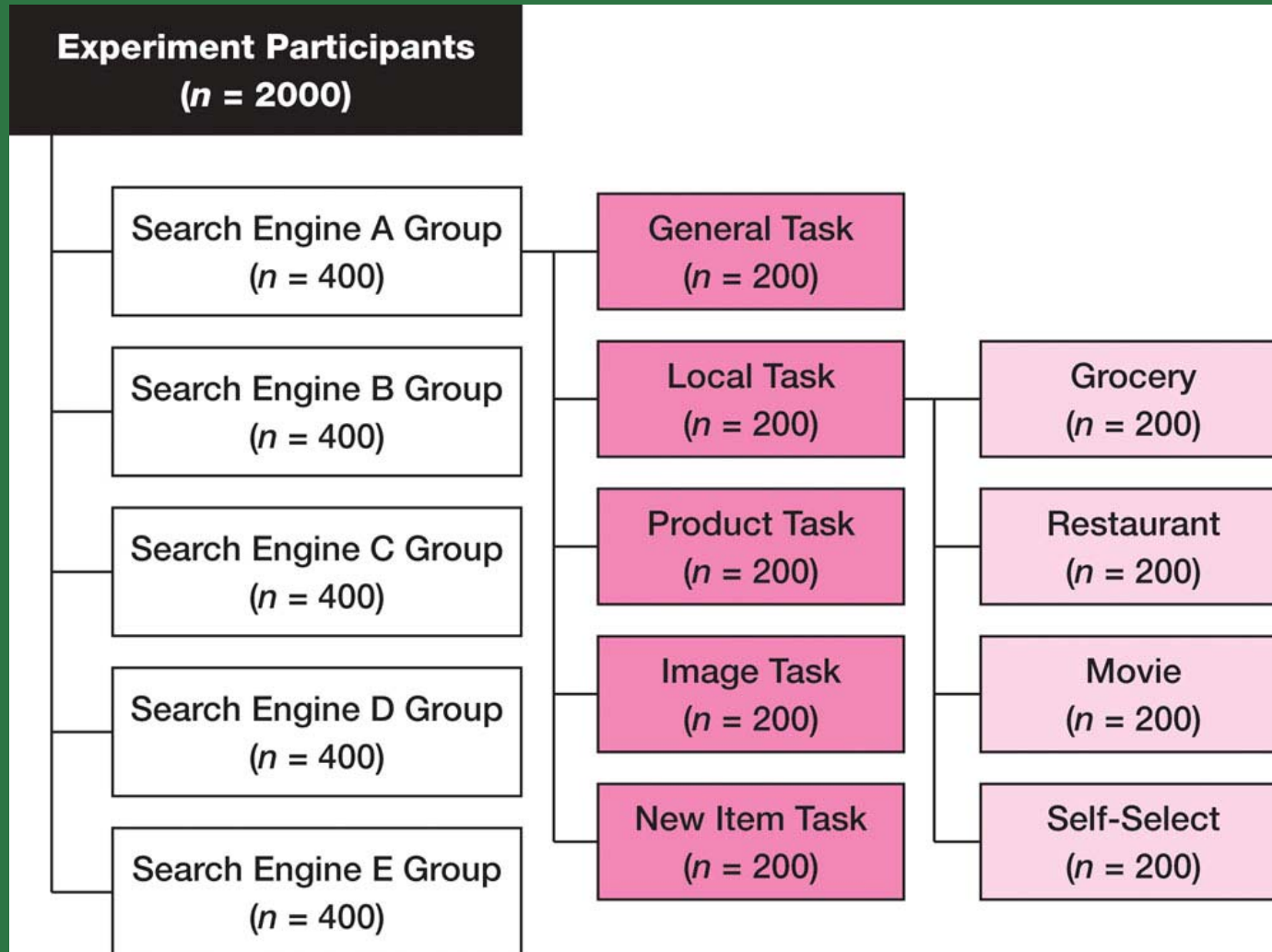
Appendix 15a: Key Terms

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

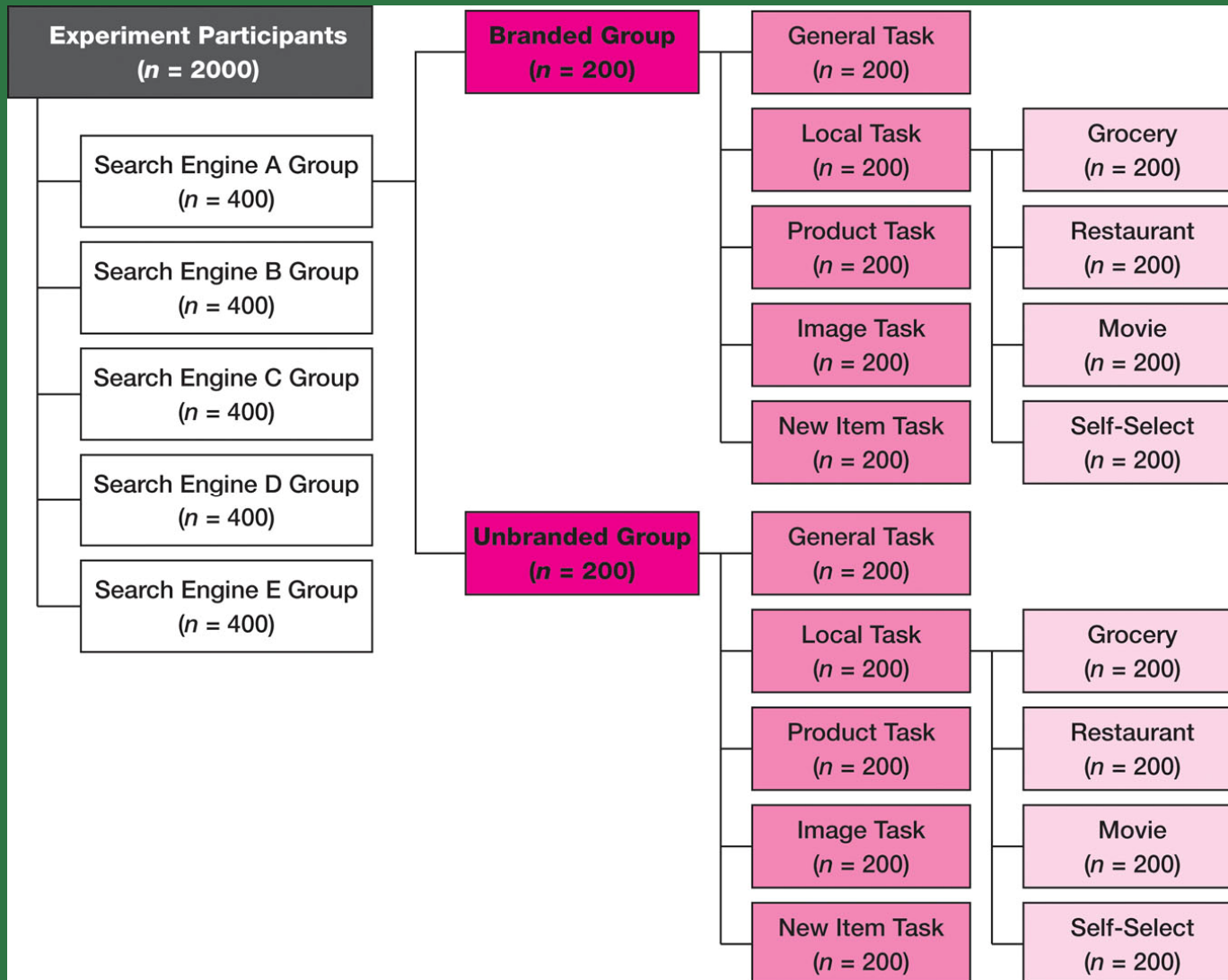
Addendum: Keynote CloseUp



Keynote Experiment

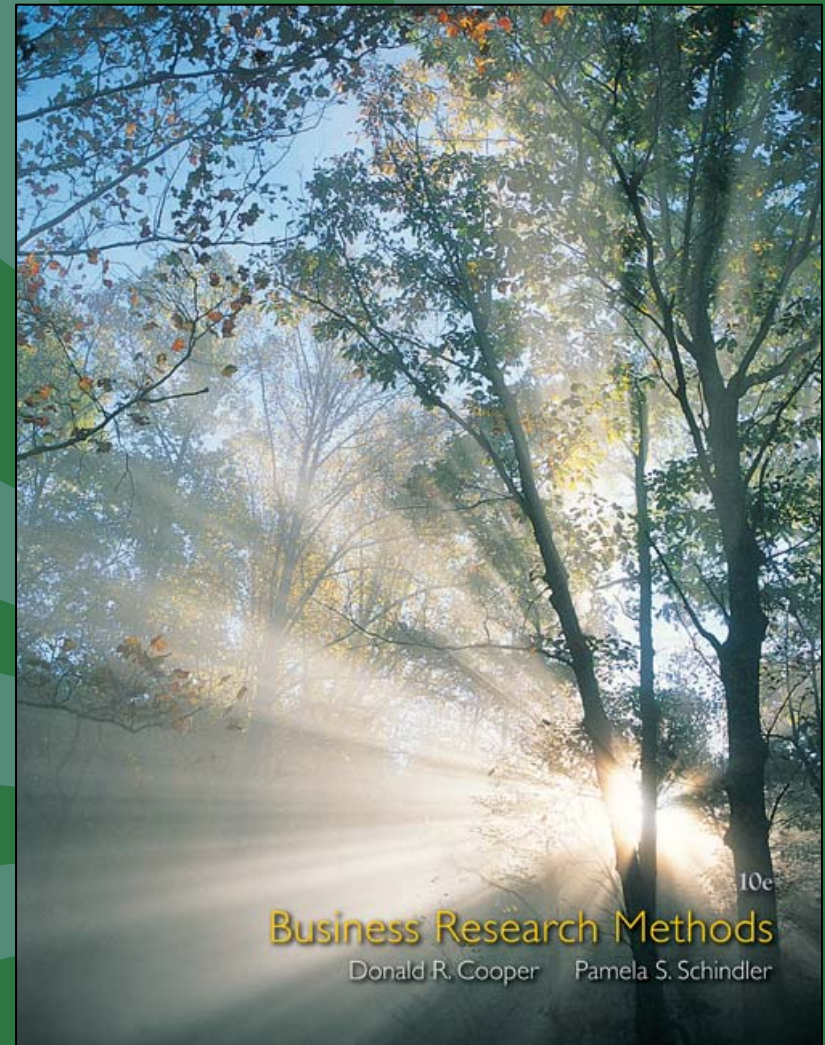



Keynote Experiment (cont.)



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.

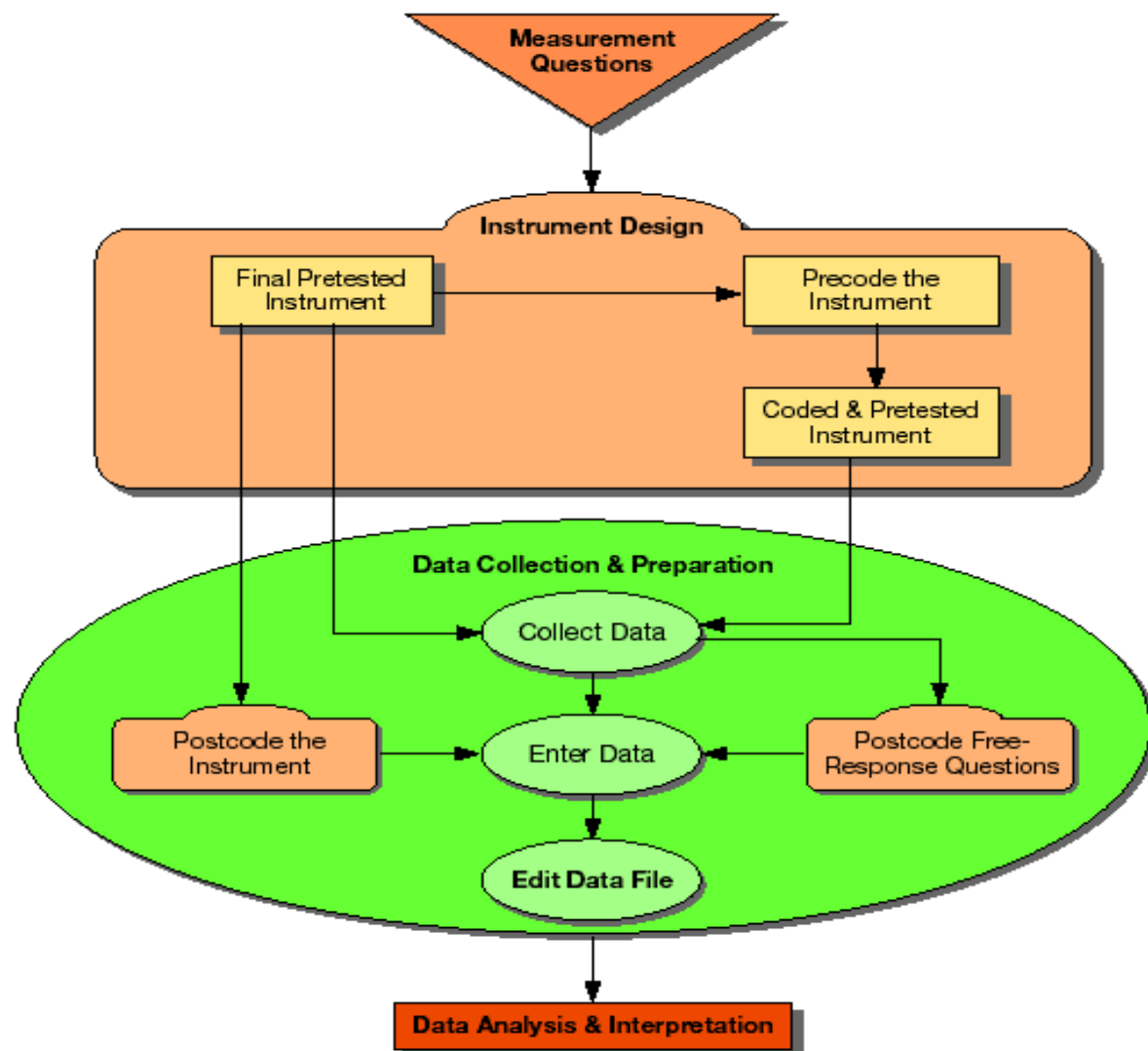


Research Adjusts for Imperfect Data

“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



RESEARCH SHOWS SHE FAVORS
24-HOUR NEWS FORMAT TO DAYTIME DRAMA.

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

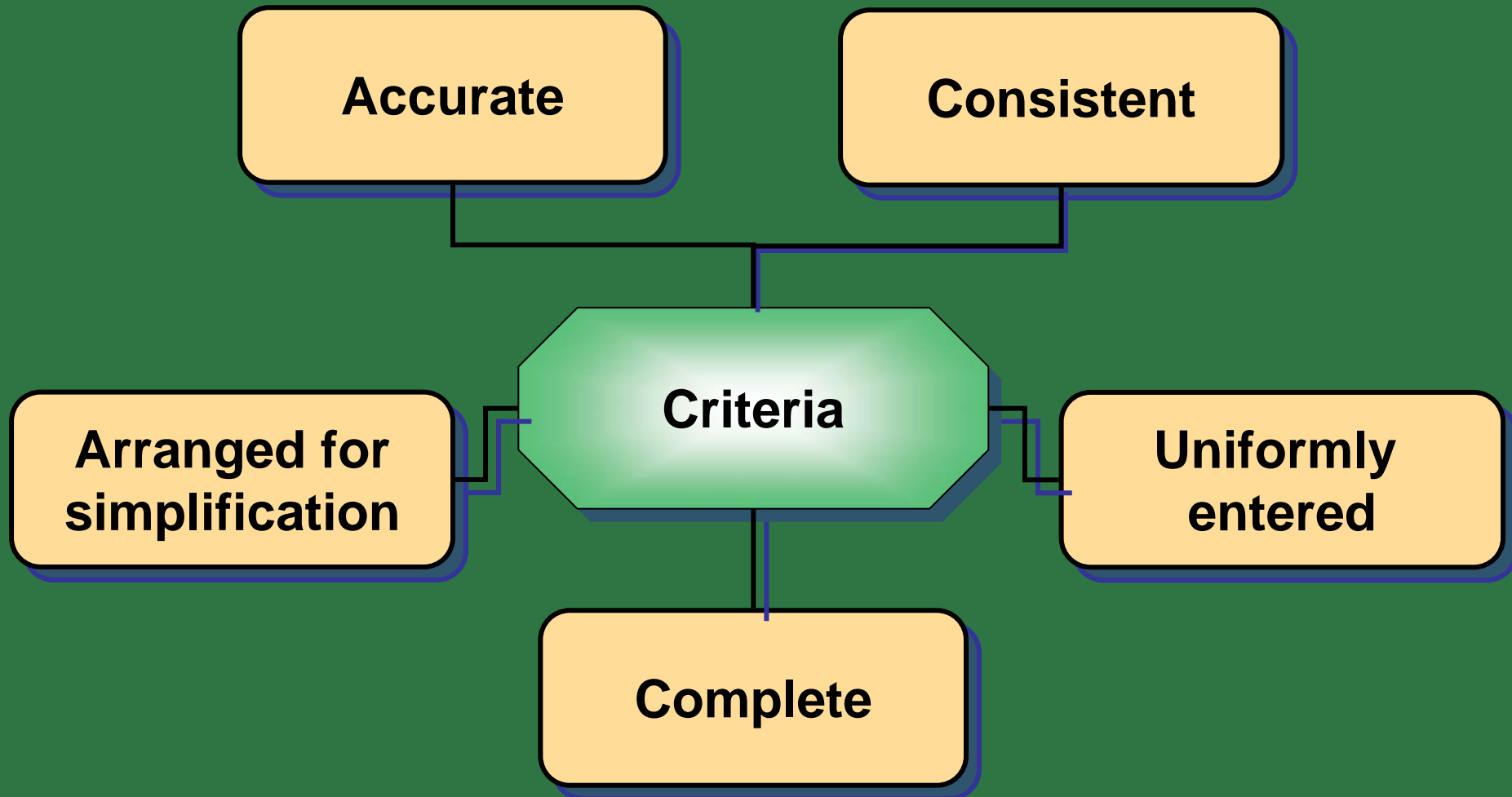
Now let's talk about software support. If the software hiccups or takes an unscheduled break, the wrong questions can get answered. Only nonstop support can keep that from happening.

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



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
or you were dead



For us, times haven't changed

You're under the gun to get answers fast, but you can't afford to slow speed in the sake of accuracy. After all, being quick on the draw doesn't do any good if you miss the mark.

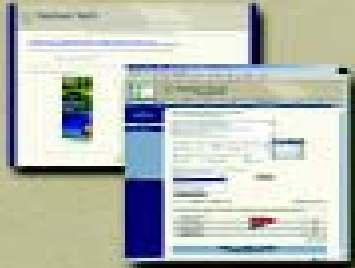
With Online web surveys, we're not discounting, we're moving on for quick data collection that is dead on. With knowledgeable project directors and capable web programmers, we know how to roll up our sleeves and get the job done right... right now.

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

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

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

(801) 373-7735



Western Wats
Online Surveys • Real-time Reporting • Web-based Data Collection

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	RECNUM
_____	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

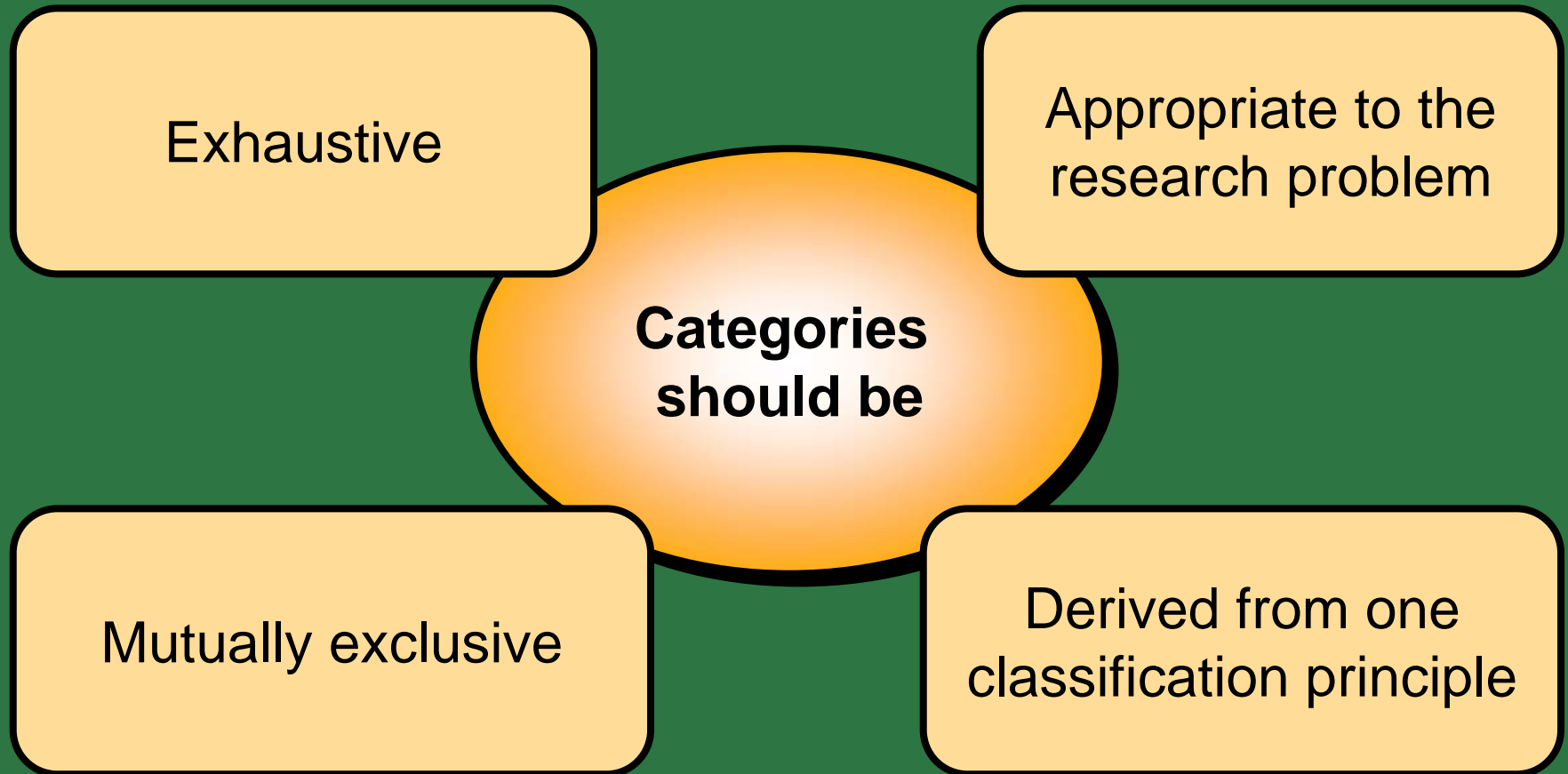
Reason for purchase

1 = Mentioned

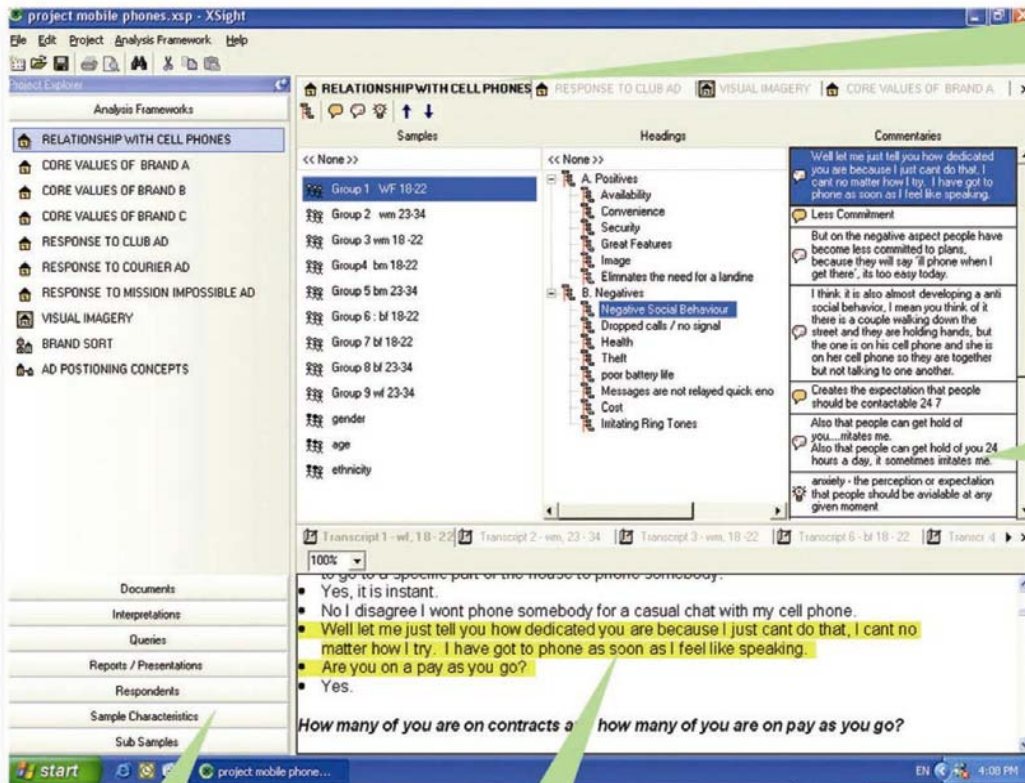
0 = Not mentioned

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



Content Analysis



Create your own
Analysis Frameworks
with different heading
levels

Simultaneously view
and record articulations,
verbatims, and
interpretations

User-friendly
interface with
intuitive navigational
system

Mark up transcripts
as you analyze

**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

```

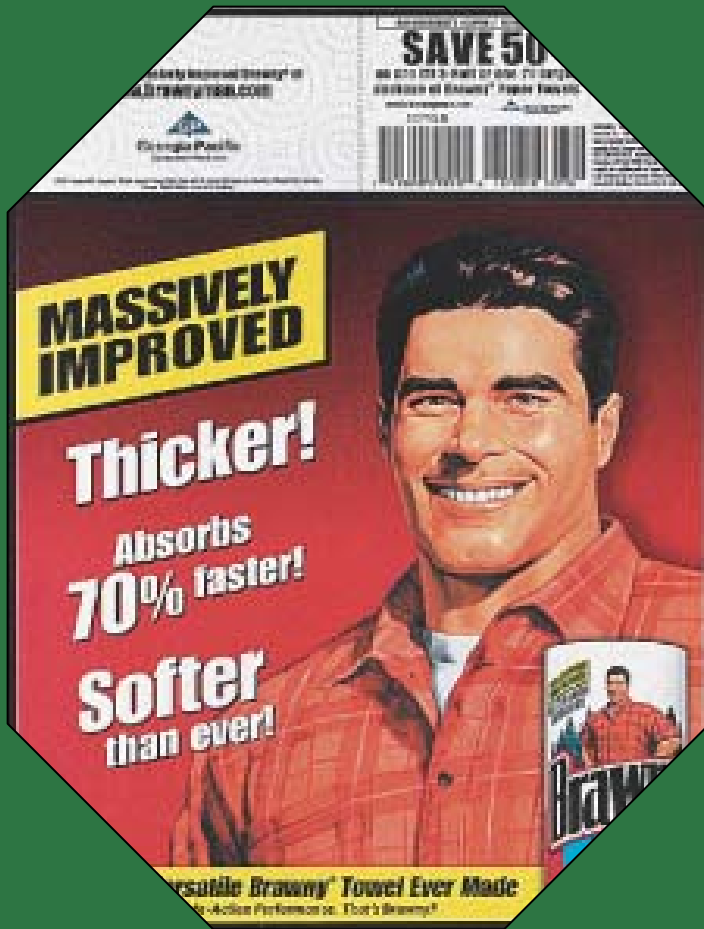
graph LR
    Fone --> Marketing
    Fone --> Features
    Fone --> Image
    Fone --> TheLook[The Look]
    Fone --> Performance
    Marketing --> adverts[the adverts]
    Marketing --> special[special offers]
    Marketing --> expensive[expensive]
    TheLook --> goodlooking[good looking]
    TheLook --> 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 cant 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
	100%	100%	100%
Total	<i>n</i> = 650	<i>n</i> = 150	<i>n</i> = 200

Data Entry

Keyboarding

**Database
Programs**

**Digital/
Barcodes**



**Optical
Recognition**

**Voice
recognition**

Missing Data


Listwise Deletion

Pairwise Deletion

Replacement

Microsoft Excel - Sample Survey Spreadsheet

FormatToolsDataWindowHelp

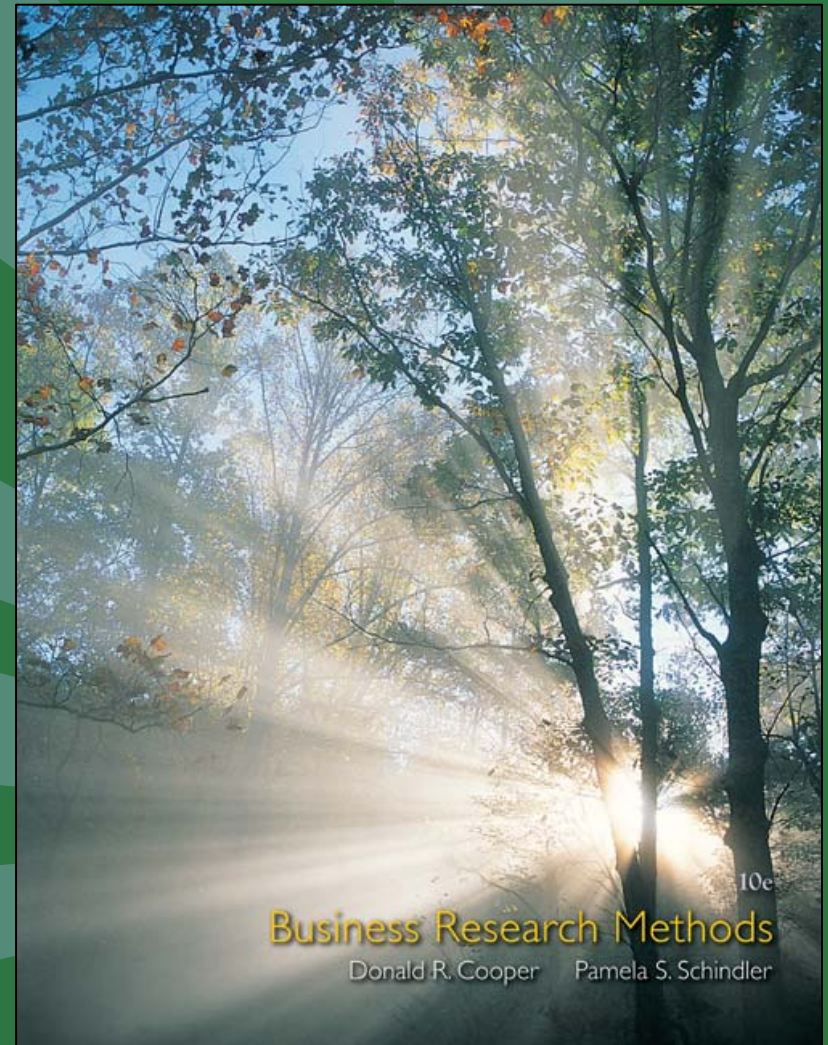


Key Terms

- | | |
|---|---|
| <ul style="list-style-type: none">• Bar code• Codebook• Coding• Content analysis• Data entry• Data field• Data file• Data preparation• Data record• Database | <ul style="list-style-type: none">• Don't know response• Editing• Missing data• Optical character recognition• Optical mark recognition• Precoding• Spreadsheet• Voice recognition |
|---|---|

Appendix 15a

Describing Data Statistically



Frequencies

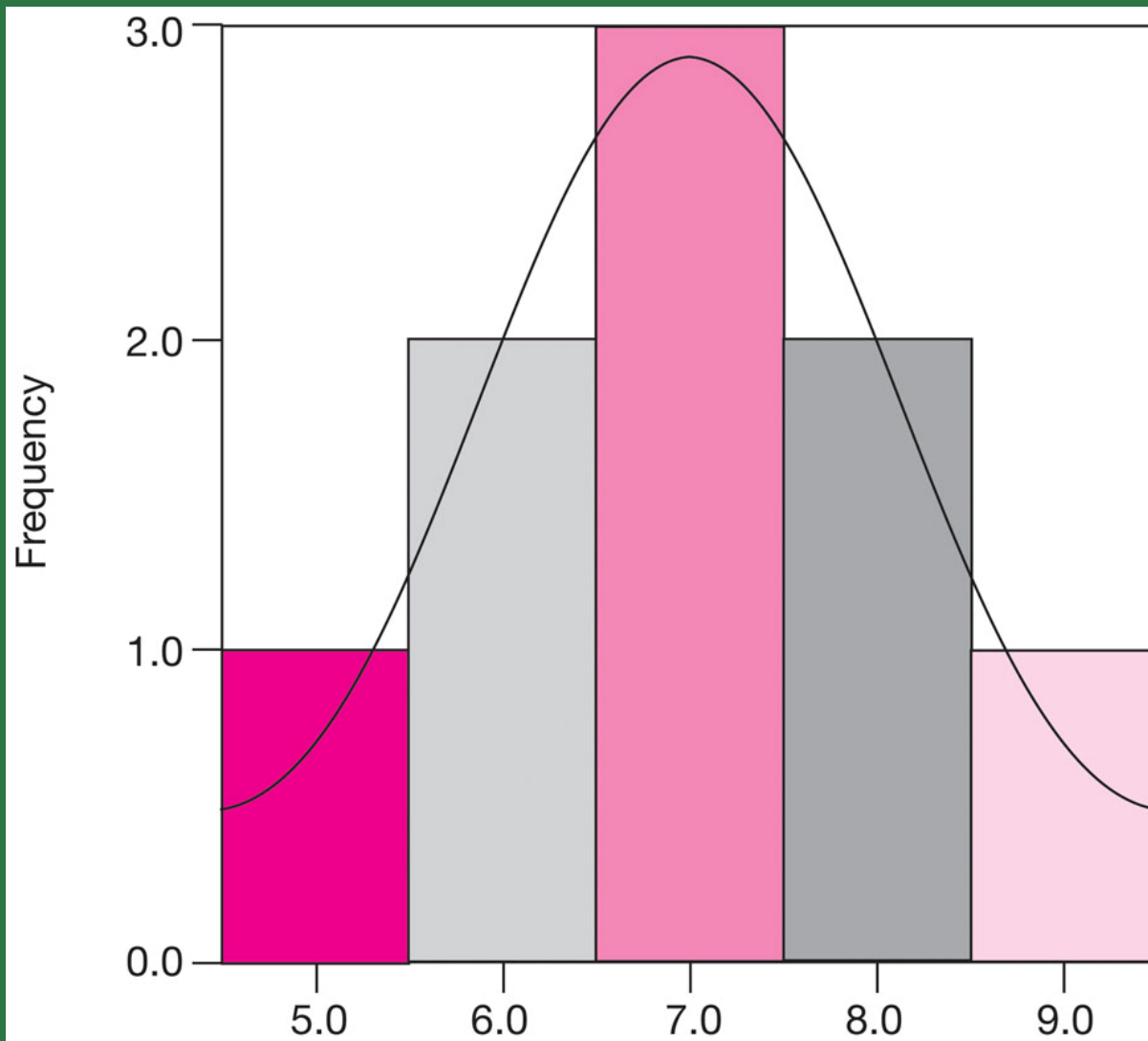
A

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	

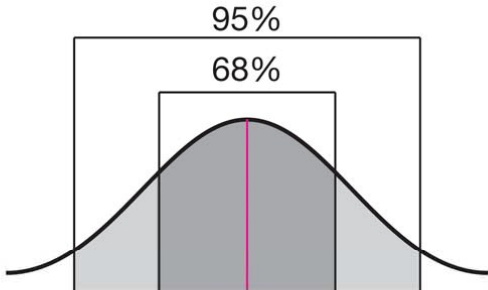
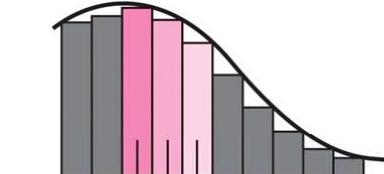
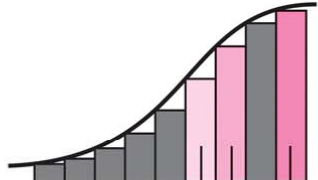
B

	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 Mean Median	Mean Mode Median
	A	B	C

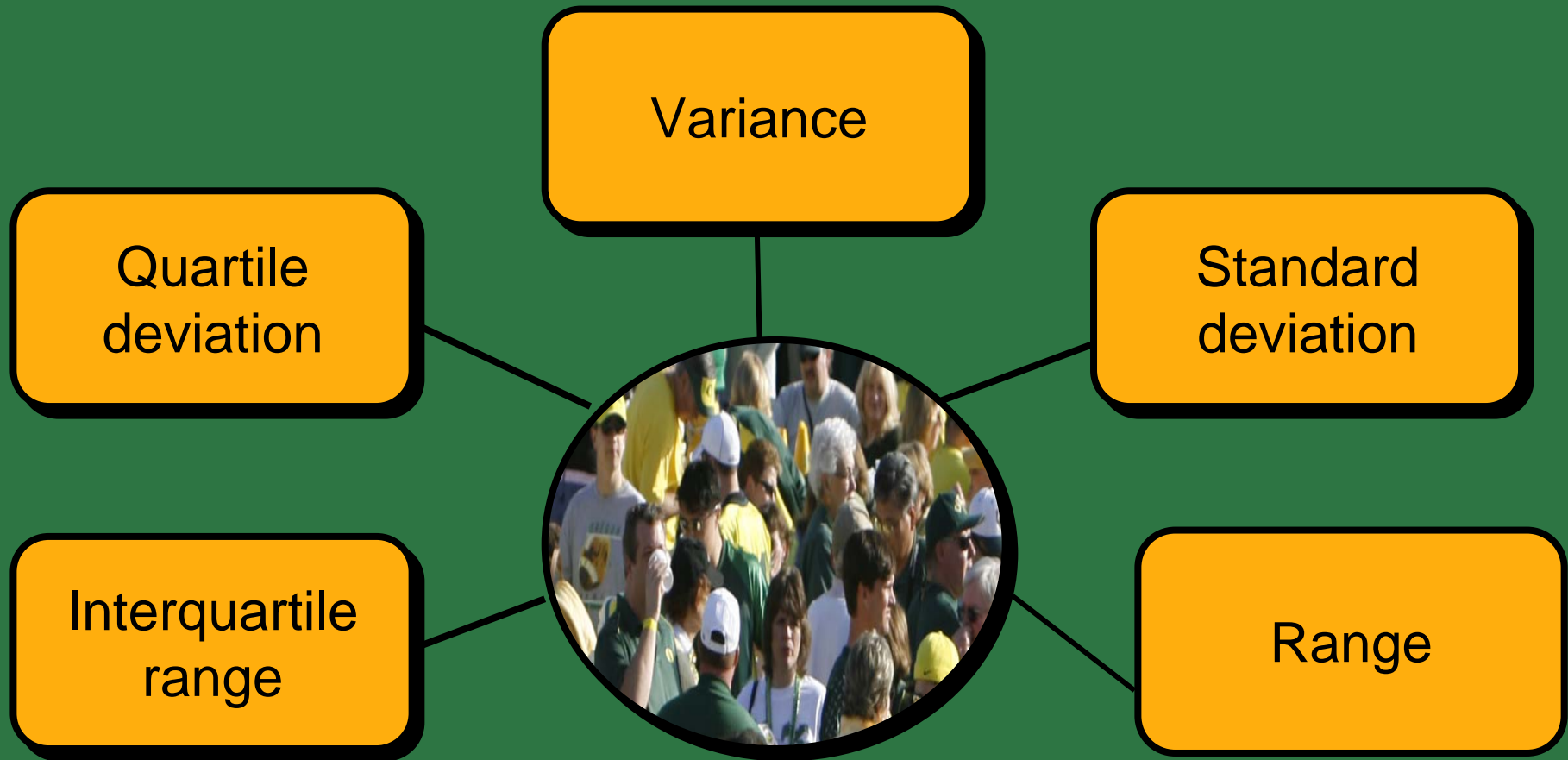
Measures of Central Tendency

Mean

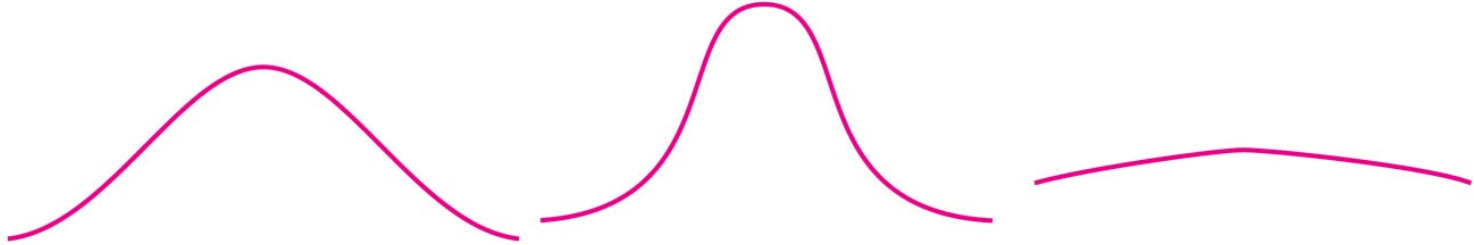
Median

Mode

Measures of Variability



Summarizing Distribution Shape

			
Shape: Kurtosis	Mesokurtic	Leptokurtic	Platykurtic
	D	E	F

Symbols

Variable

Mean

Proportion

Variance

Standard deviation

Size

Standard error of the mean

Standard error of the proportion

Population

μ

Π

σ^2

σ

N

σ_x

σ_p

Sample

\bar{x}

p


s^2

s

n

S_x

S_p

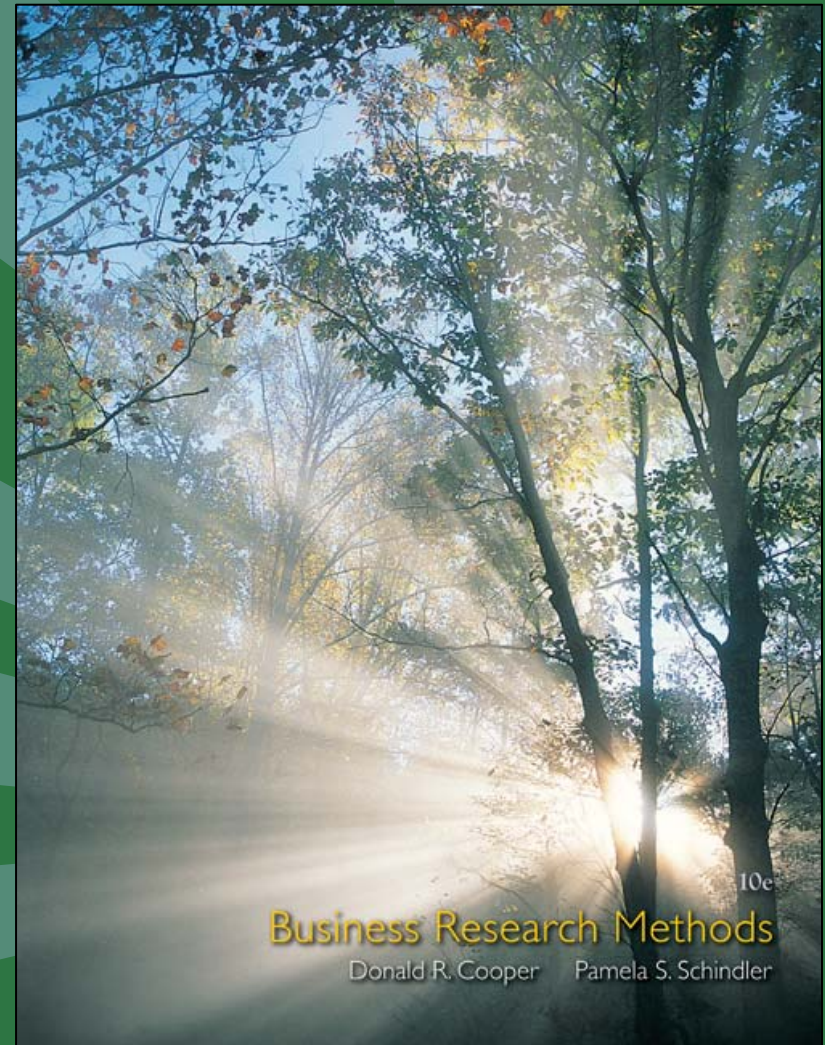



Key Terms

- | | |
|--|---|
| <ul style="list-style-type: none">• Central tendency• Descriptive statistics• Deviation scores• Frequency distribution• Interquartile range (IQR)• Kurtosis• Median• Mode | <ul style="list-style-type: none">• 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 unformed? 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

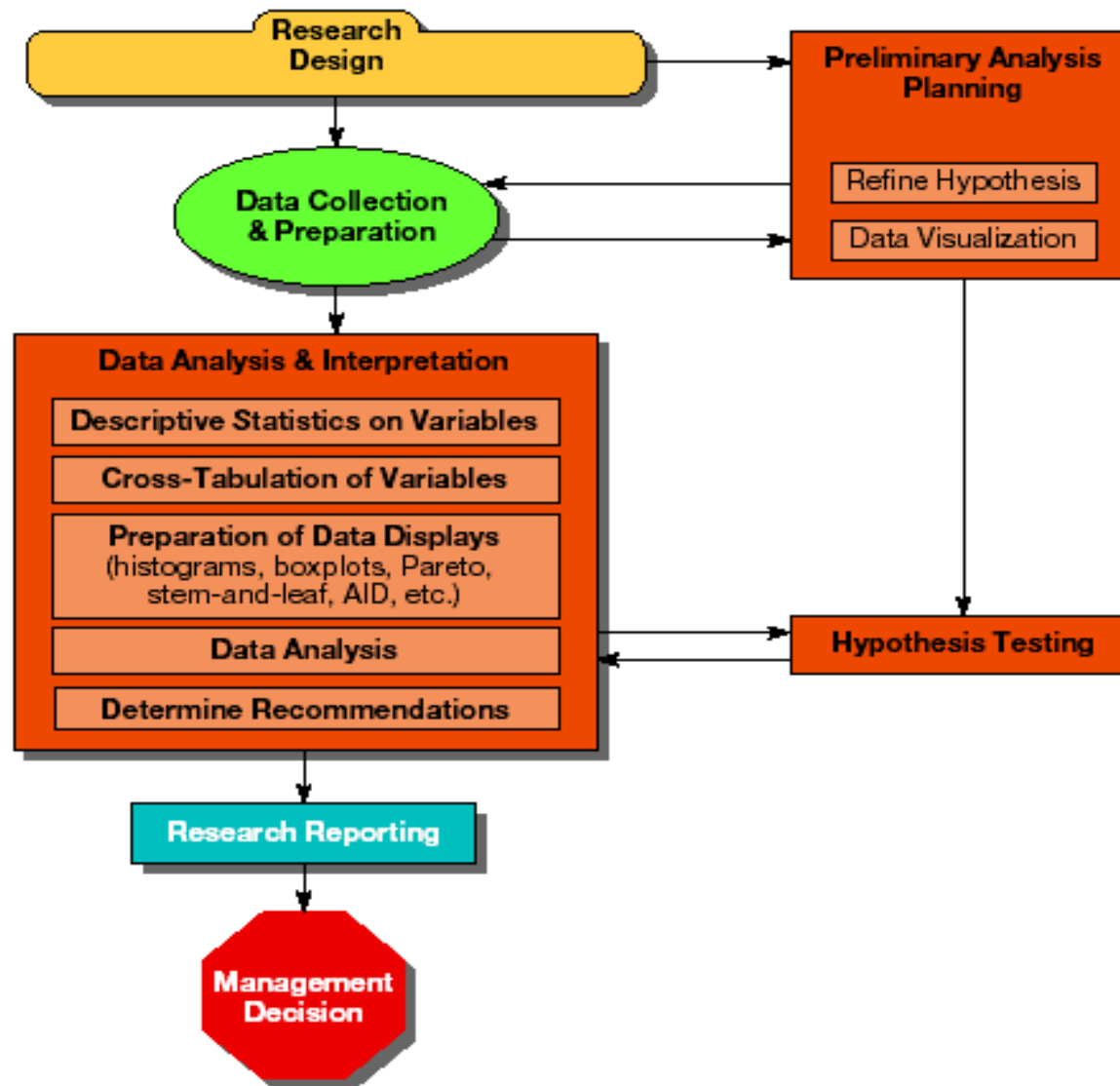


The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst, there are two side-by-side hexagonal shapes. The left hexagon is light orange and contains the word 'Exploratory'. The right hexagon is a darker orange and contains the word 'Confirmatory'. Both hexagons have a thick black outline.

Exploratory

Confirmatory

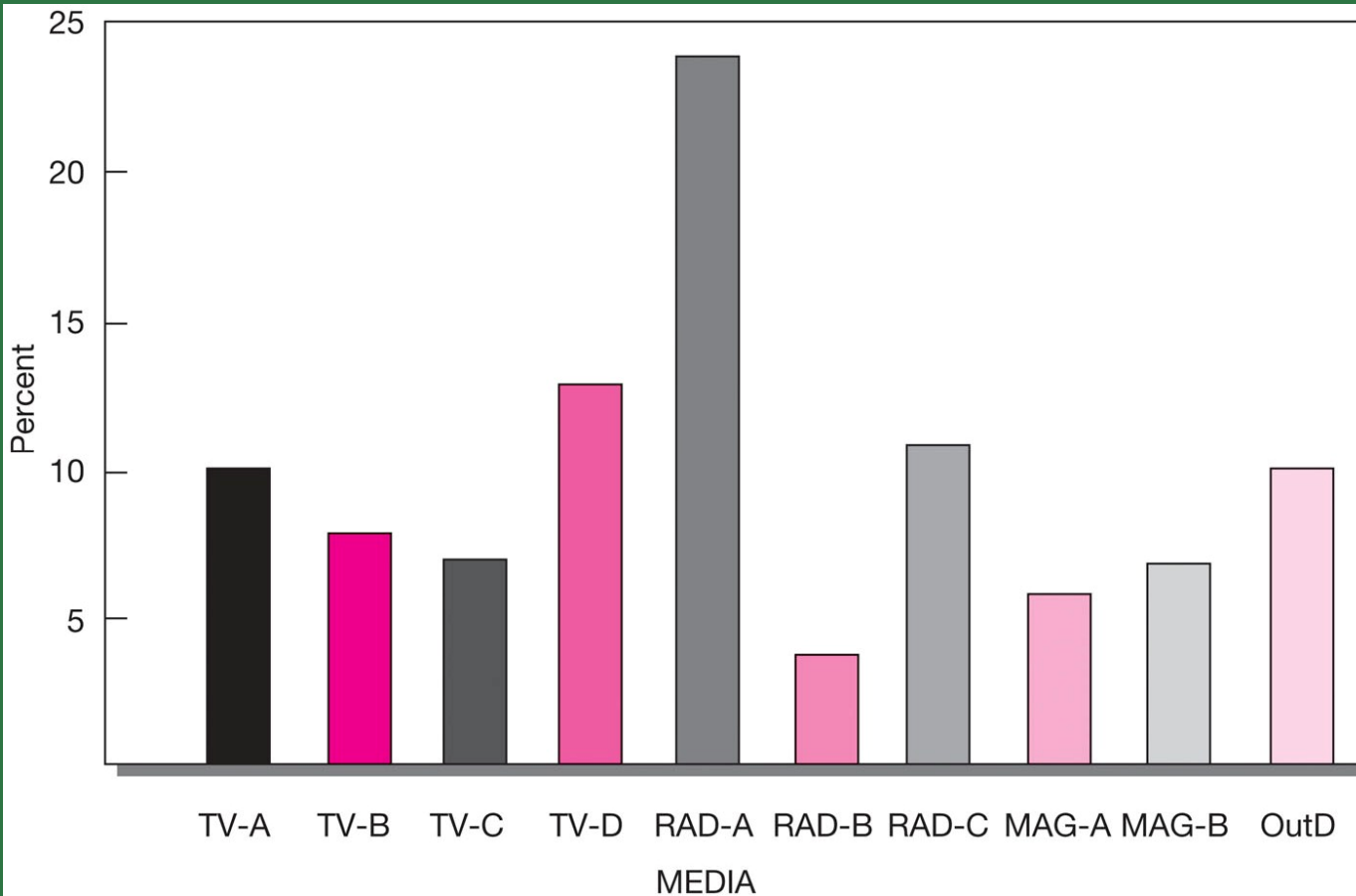
Data Exploration, Examination, and Analysis in the Research Process



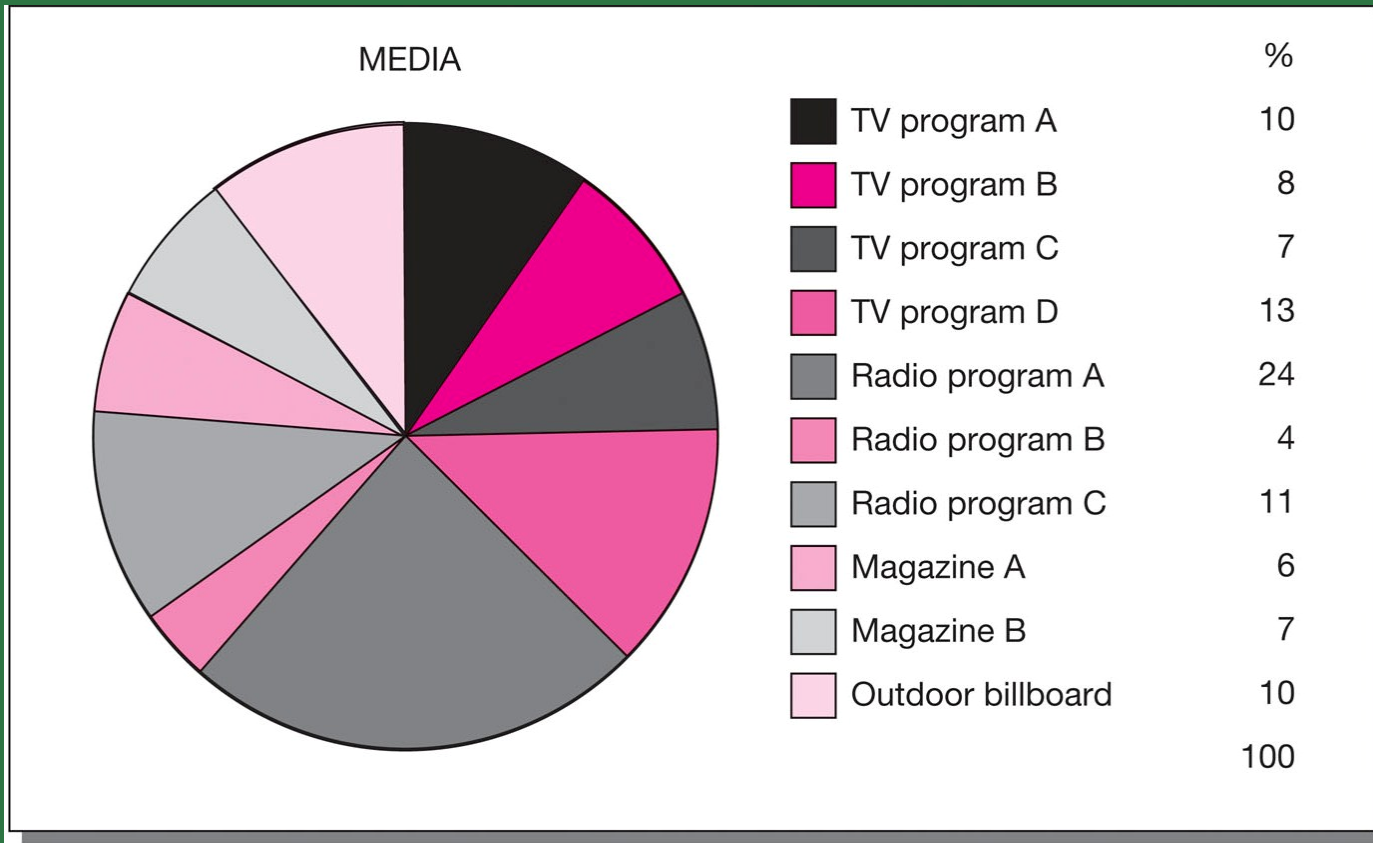
Frequency of Ad Recall

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



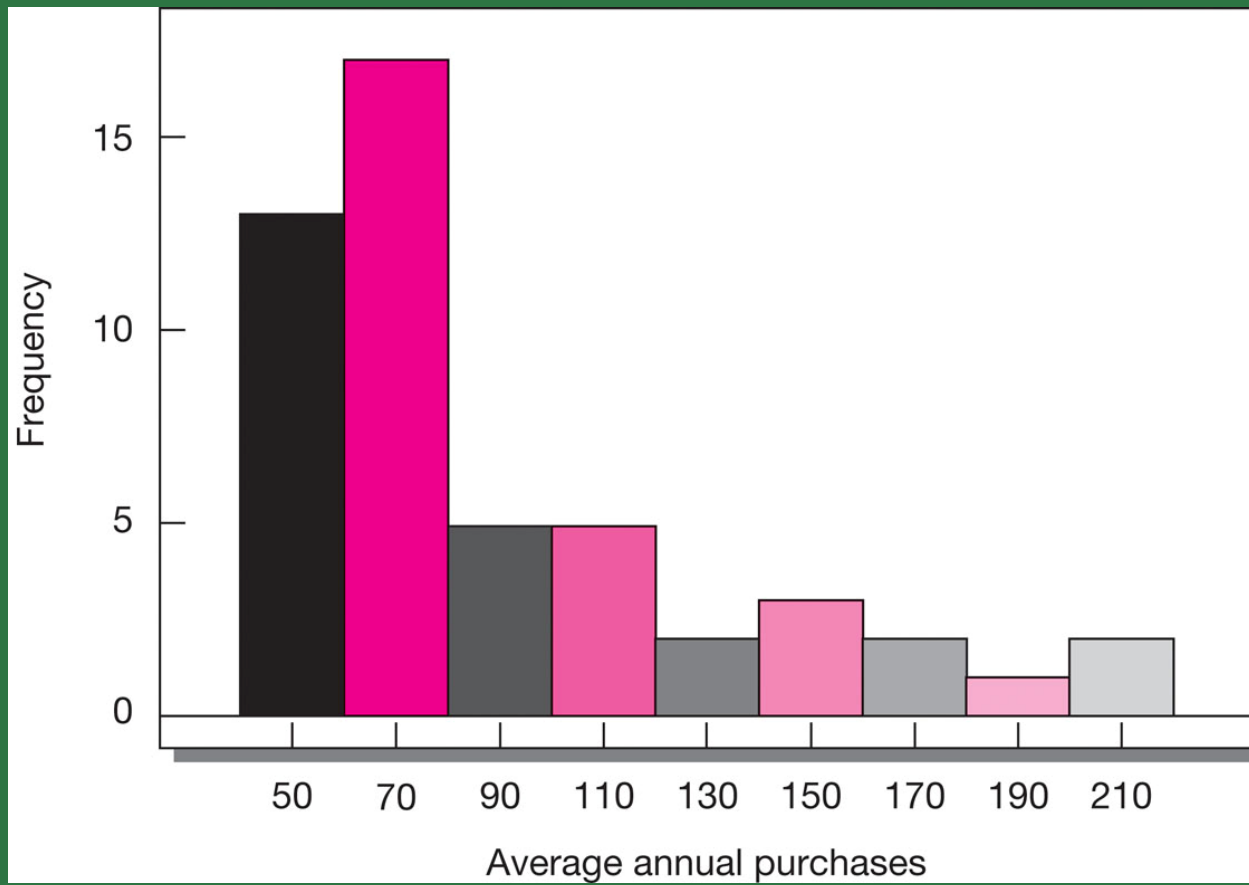
Pie Chart



Frequency Table

Value	Frequency	Percent	Cumulative Percent	Value	Frequency	Percent	Cumulative Percent
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	

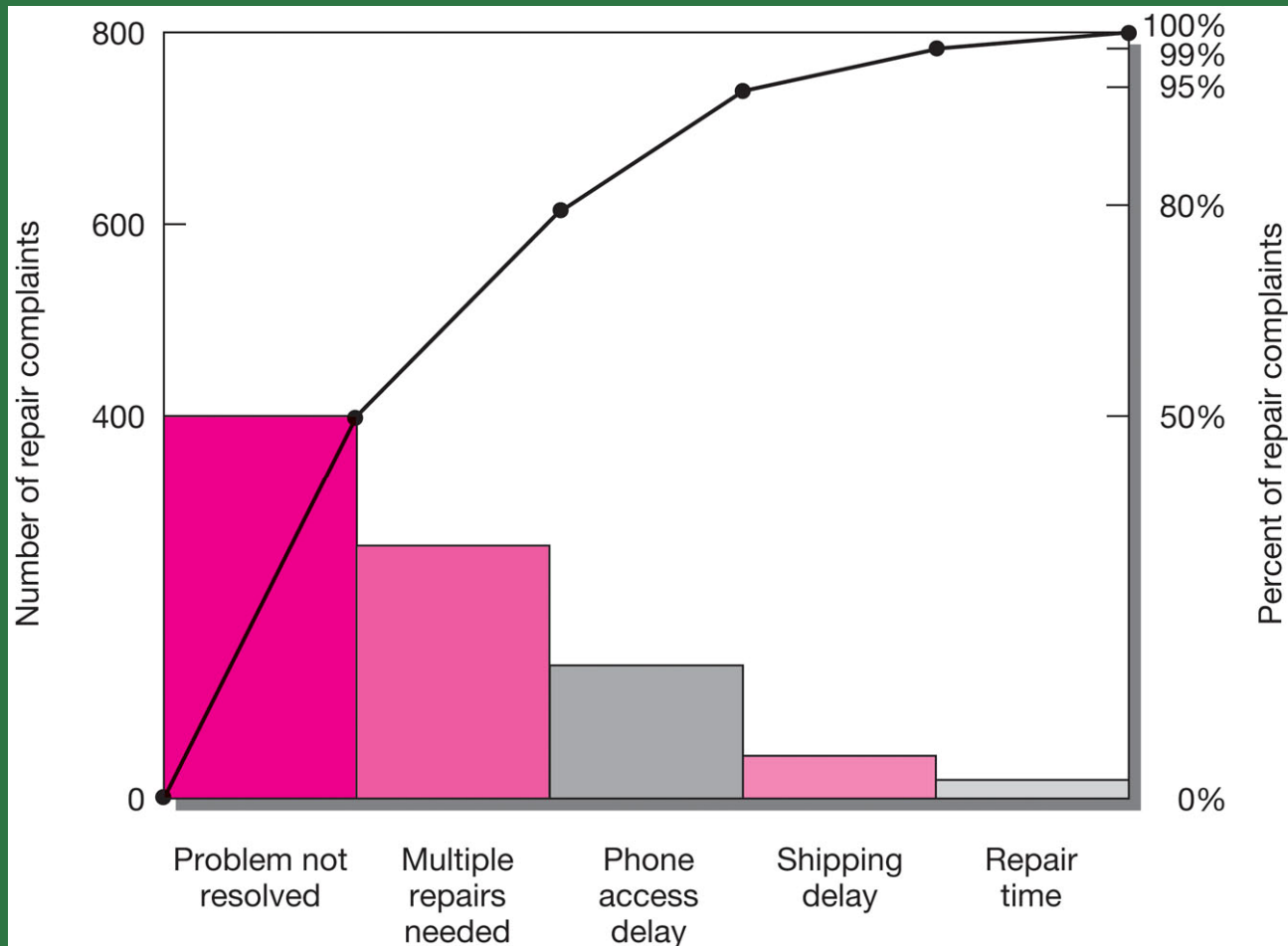
Histogram



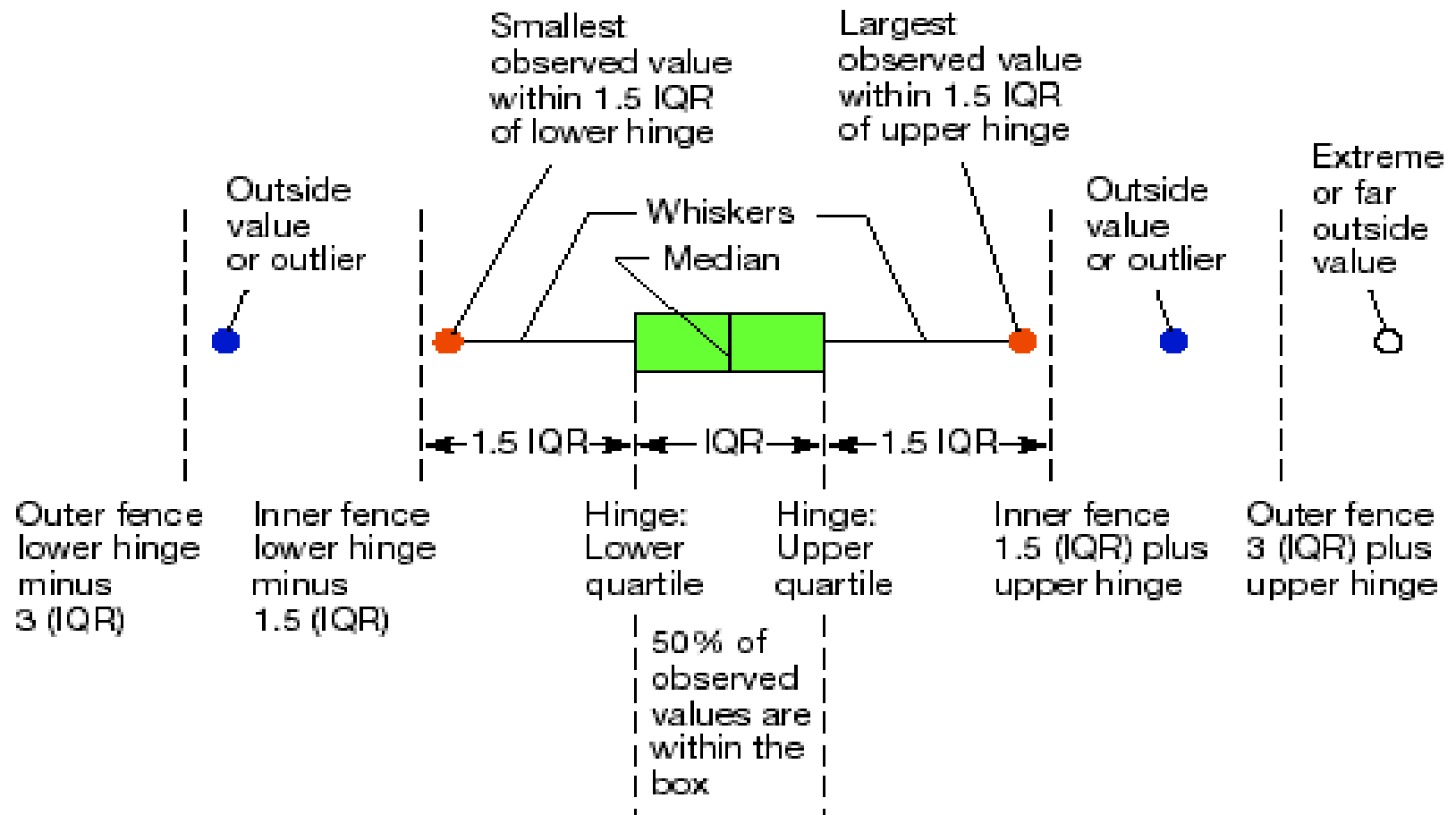
Stem-and-Leaf Display

5	4556666788889
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



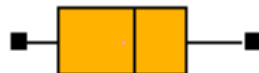
Symmetric—
larger relative size in
proportion to sample size



Right skewed



Left skewed



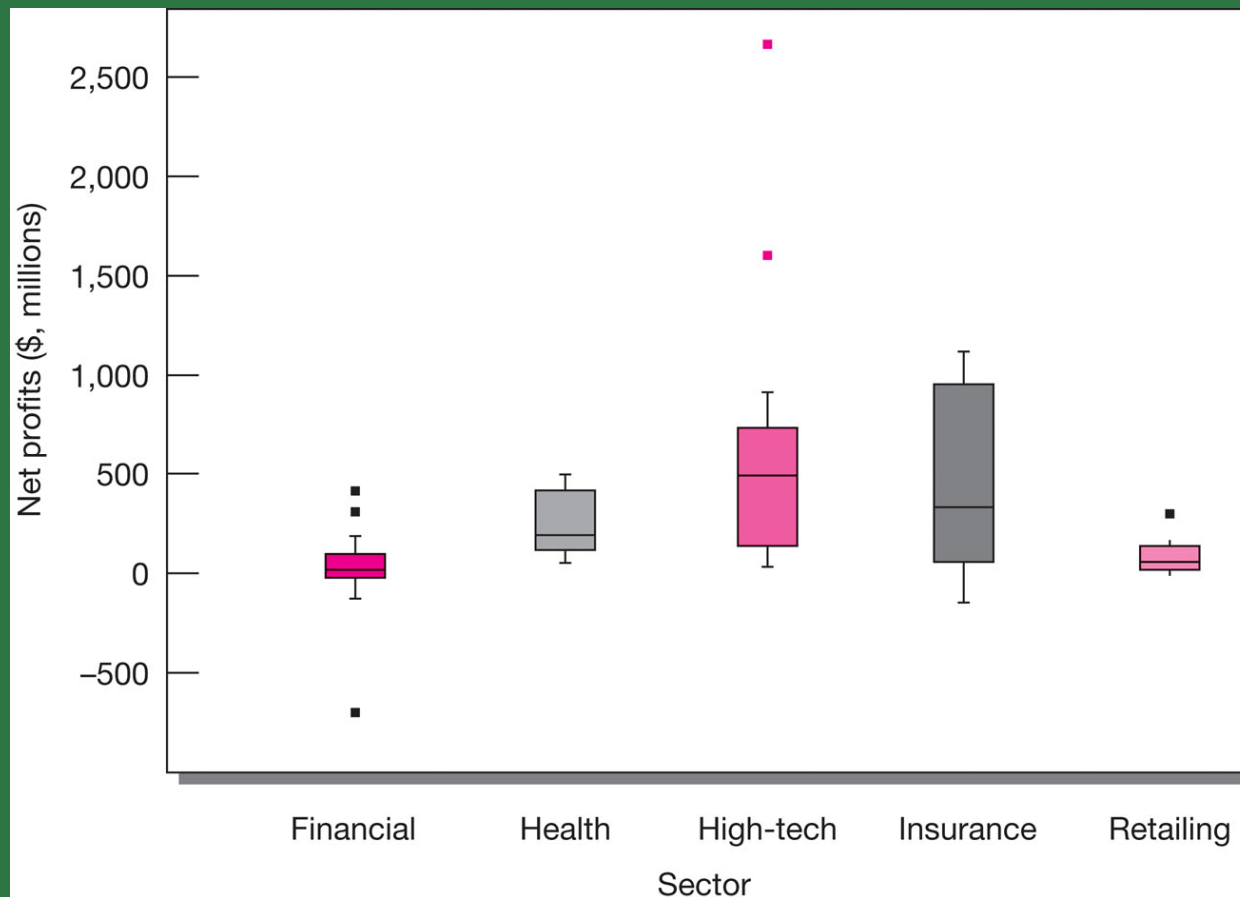
Small spread




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



Boxplot Comparison



This area is famous for tea...



Boston Harbor

10 Minute Drive Time Study Area

but will it buy cappuccinos?

Charles Demographics	Weston Tea Party Shop 10 mile Drive Time	Boston, MA	Massachusetts
Residential Population	954,791	661,420	6,365,677
Median Age	32.5 years	31.7 years	36.8 years
% of Population Age 25 to 34	22.8%	22.3%	18.1%
Daytime Population	443,157	568,748	3,979,488
Total Households	71,674	341,420	2,470,248
% of Households with Children	14.8%	22.3%	32.7%
% of Households with no Vehicle	47.2%	36.3%	15.5%
Median Household Income	\$85,532	\$71,526	\$58,712
Total Businesses	31,528	34,091	288,786
No. of Eating & Drinking Places	1,788	1,090	14,812
Sales of Eating & Drinking Places	\$1,192 million	\$1,767 million	\$16,183 million
No. of Hotels & Other Lodging	88	113	2,285
Top ZIP4 Cluster	Young Liberal	Bohemian Mix	Global Country

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 circles, polygons or drive times. A profile report organizes the detailed census data into easy to handle categories, such as age or income distributions.

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 with households 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 small outlet or establishing a new service for a changing community. It's your grounds for success!

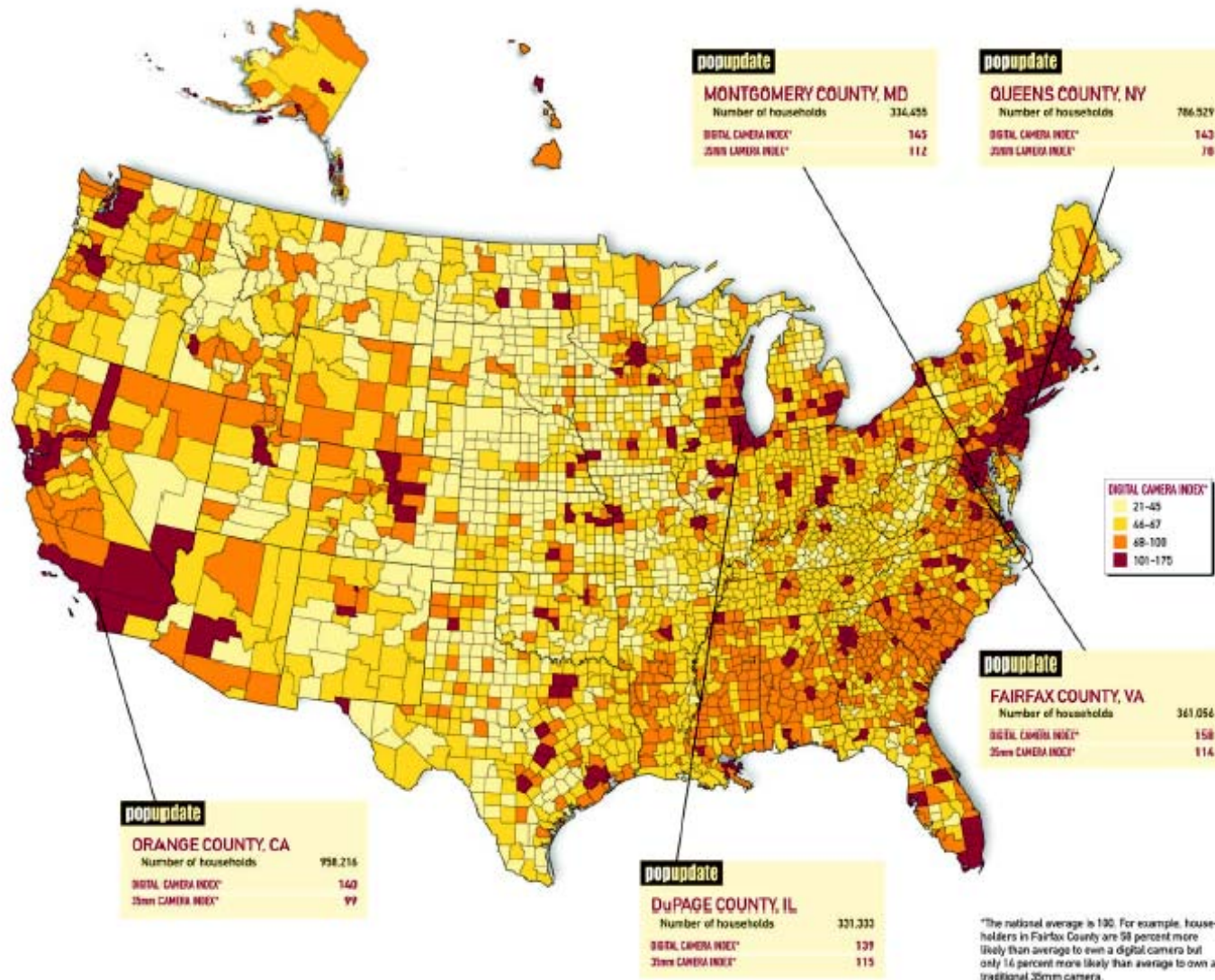
PCensus

For a live personalized online demo, call 1.866.693.1334 or visit www.pcensus.com

Microsoft is a registered trademark of Microsoft Corporation.
 TETRAD Computer Applications Inc.
 Email: info@tetrad.com

Geograph: Digital Camera Ownership



SPSS Cross-Tabulation

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

Marginals

Percentages in Cross-Tabulation

Study 1


OVERSEAS ASSIGNMENT

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

Study 2

OVERSEAS ASSIGNMENT

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



Guidelines for Using Percentages

Averaging percentages

Use of too large percentages

Using too small a base

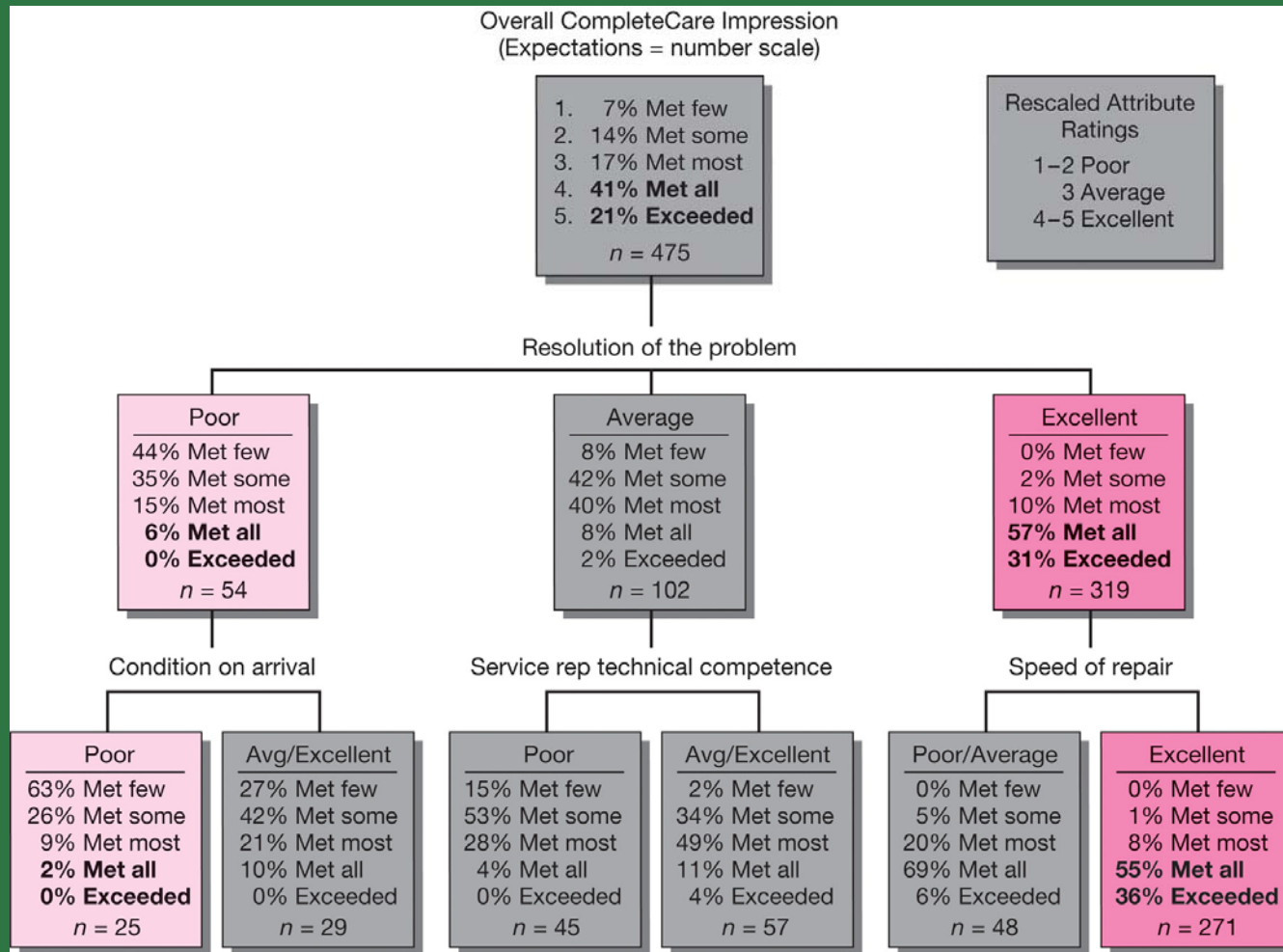
Percentage decreases can
never exceed 100%

Cross-Tabulation with Control and Nested Variables

	Control Variable					
	Category 1			Category 2		
	Nested Variable			Nested Variable		
	cat 1	cat 2	cat 3	cat 1	cat 2	cat 3
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.

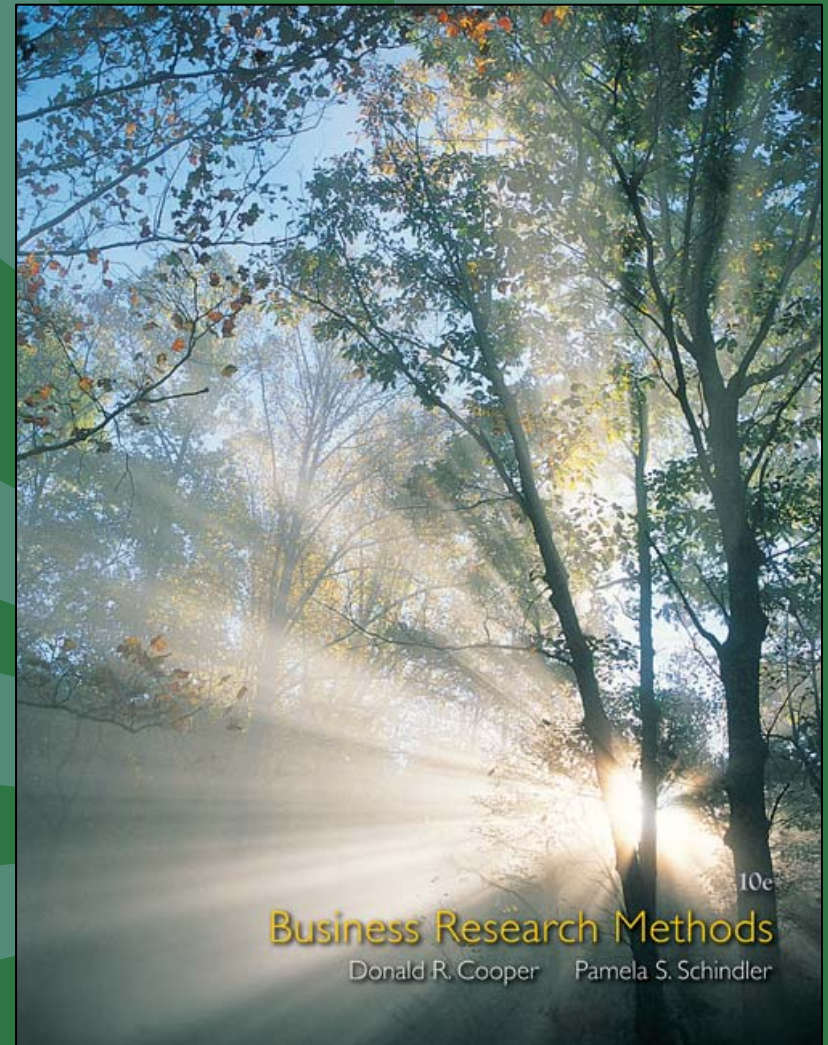
Great data exploration and analysis delivers insight from data.



Key Terms

- | | |
|---|--|
| <ul style="list-style-type: none">• Automatic interaction detection (AID)• Boxplot• Cell• Confirmatory data analysis• Contingency table• Control variable• Cross-tabulation• Exploratory data analysis (EDA) | <ul style="list-style-type: none">• 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

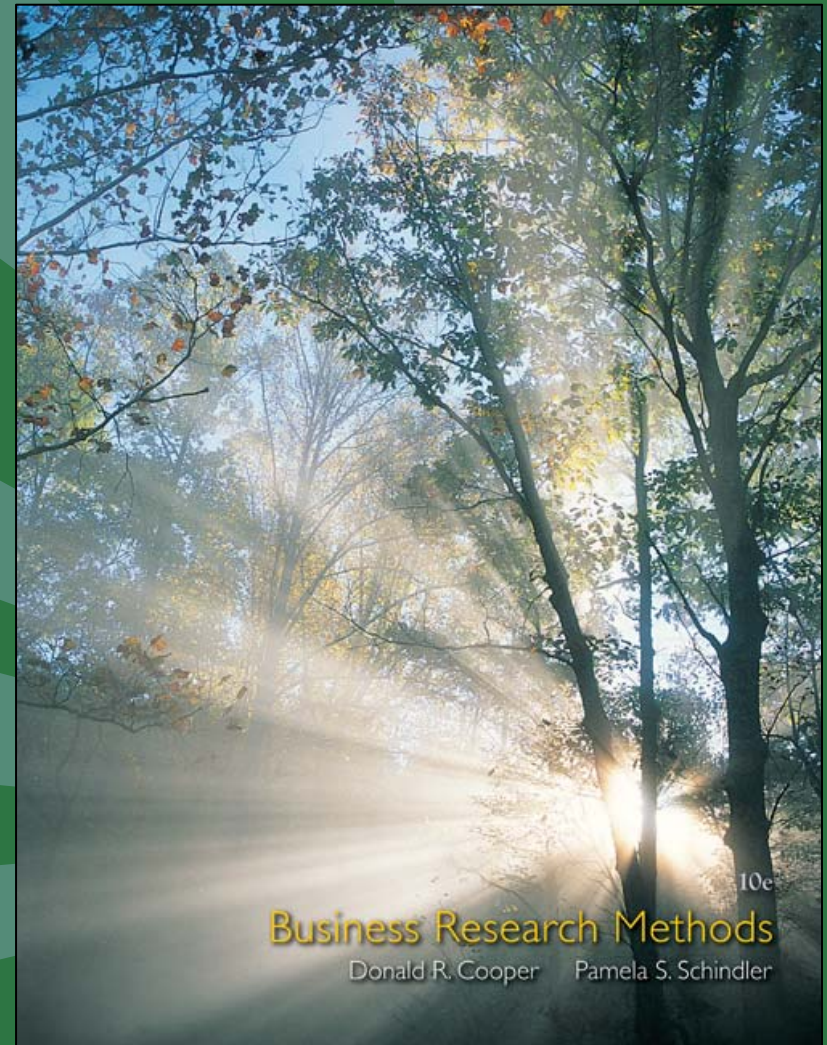
	Average Spending (EURO)	Average Number of purchases	Average transaction (EURO)	Average transaction (Dollars)*
Germany	521	10	52	68
France	509	8	64	83
Italy	454	7	65	84
United Kingdom	1201	18	67	87
Spain	452	5	90	117
Netherlands	681	7	97	126
Denmark	1159	11	105	137
Sweden	1013	9	113	146
Belgium	790	6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

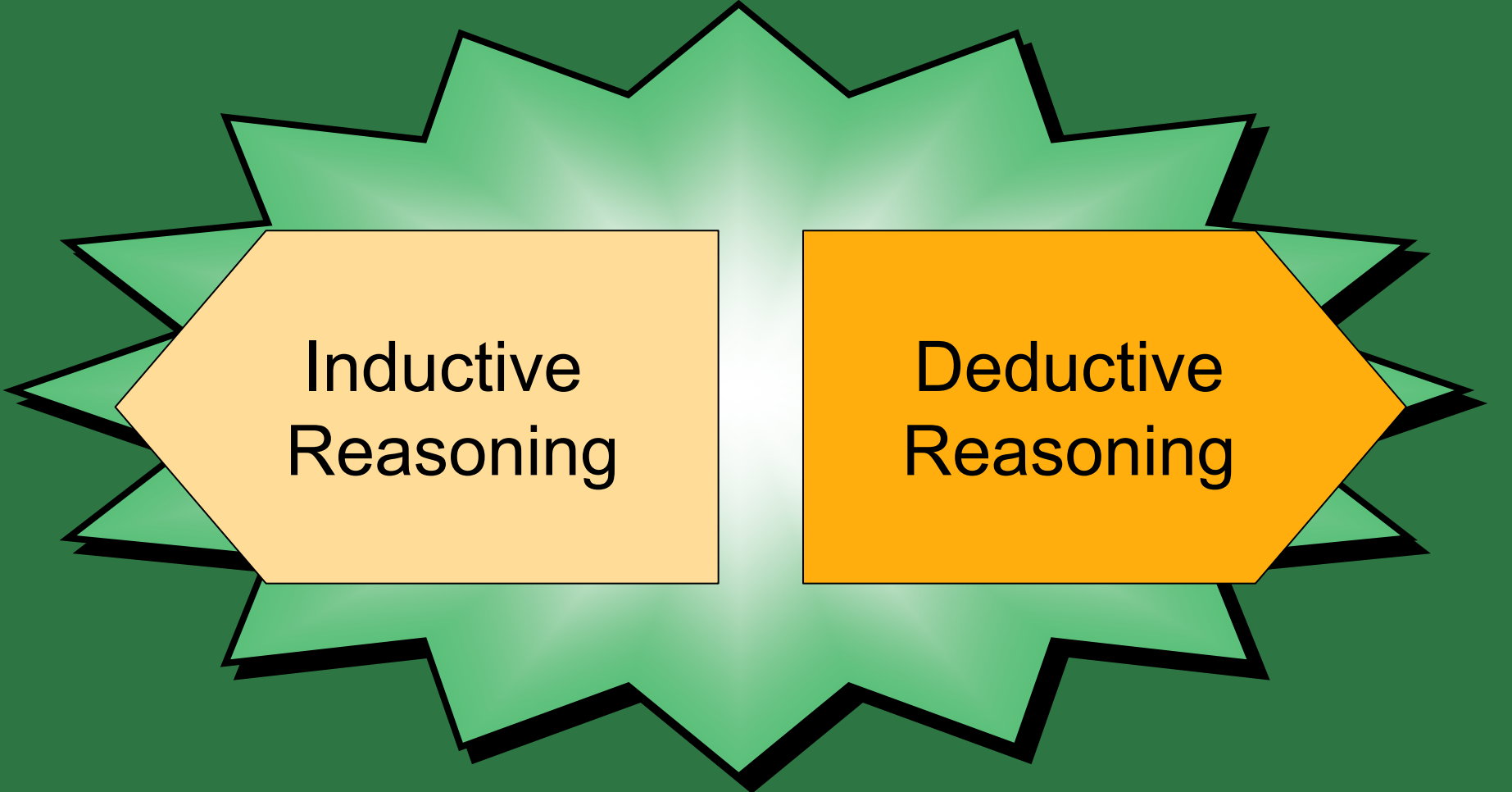


Hypothesis Testing Finds Truth

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

David Douglass, physicist
University of Rochester

Hypothesis Testing



The diagram features a dark green background. In the center, there is a light green, multi-pointed star-like shape with a black outline. Inside this star, there are two hexagonal boxes. The box on the left is light orange and contains the text 'Inductive Reasoning'. The box on the right is a darker orange and contains the text 'Deductive Reasoning'.

Inductive
Reasoning

Deductive
Reasoning

Statistical Procedures

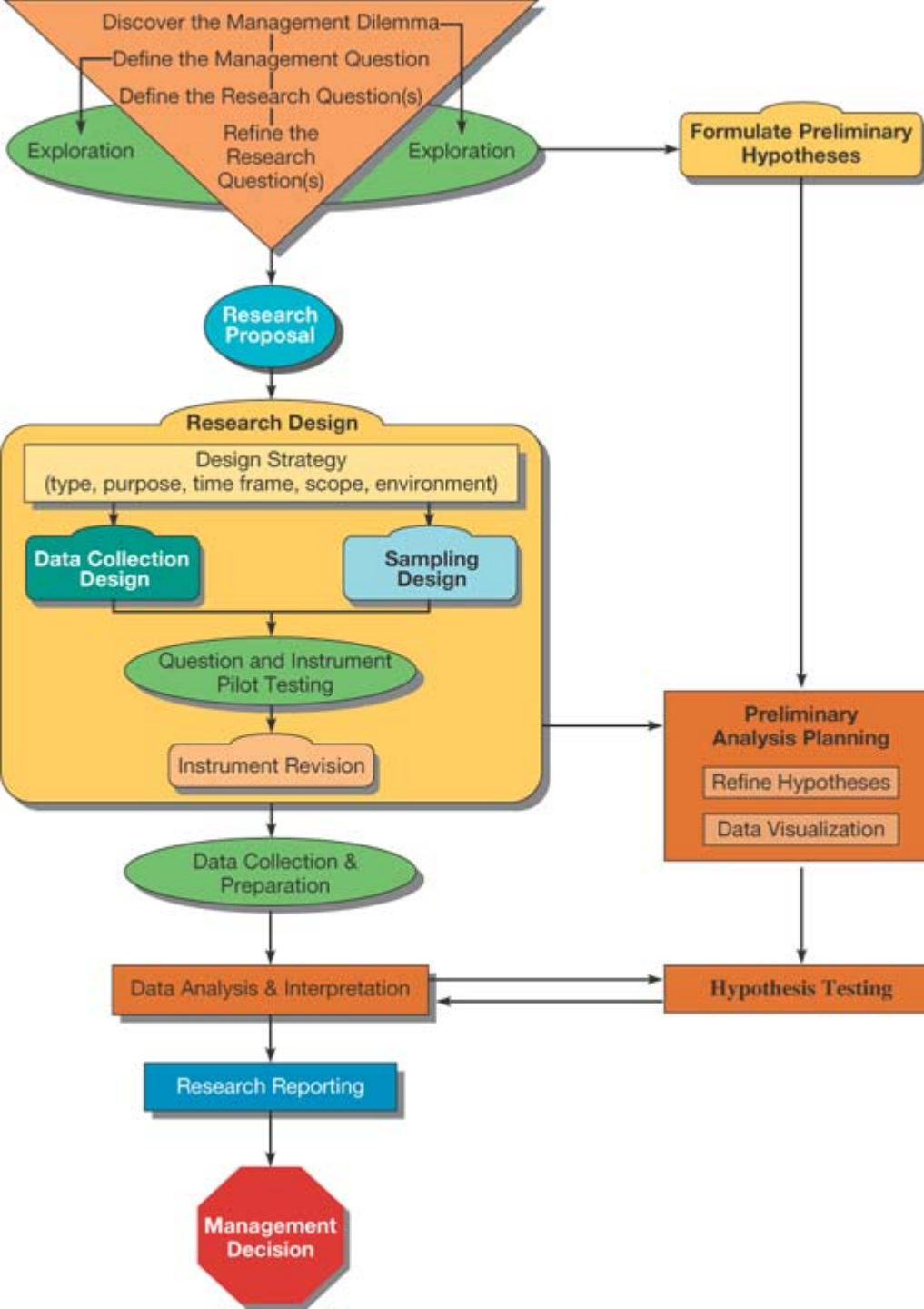


The diagram features a dark green background. In the center, there is a light green, multi-pointed starburst shape. Inside this starburst, there are two hexagonal boxes. The box on the left is light orange and contains the text 'Inferential Statistics'. The box on the right is a darker orange and contains the text 'Descriptive Statistics'.

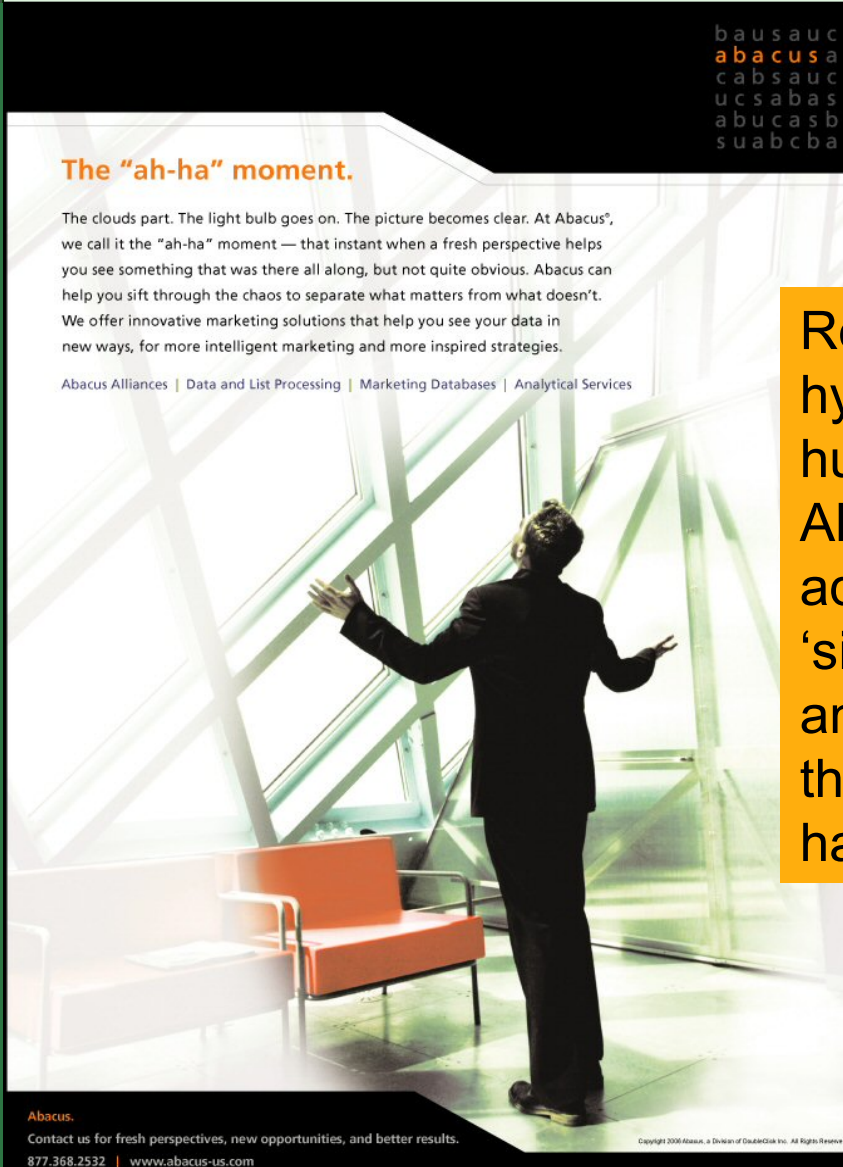
Inferential
Statistics

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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bausauc
abacus
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

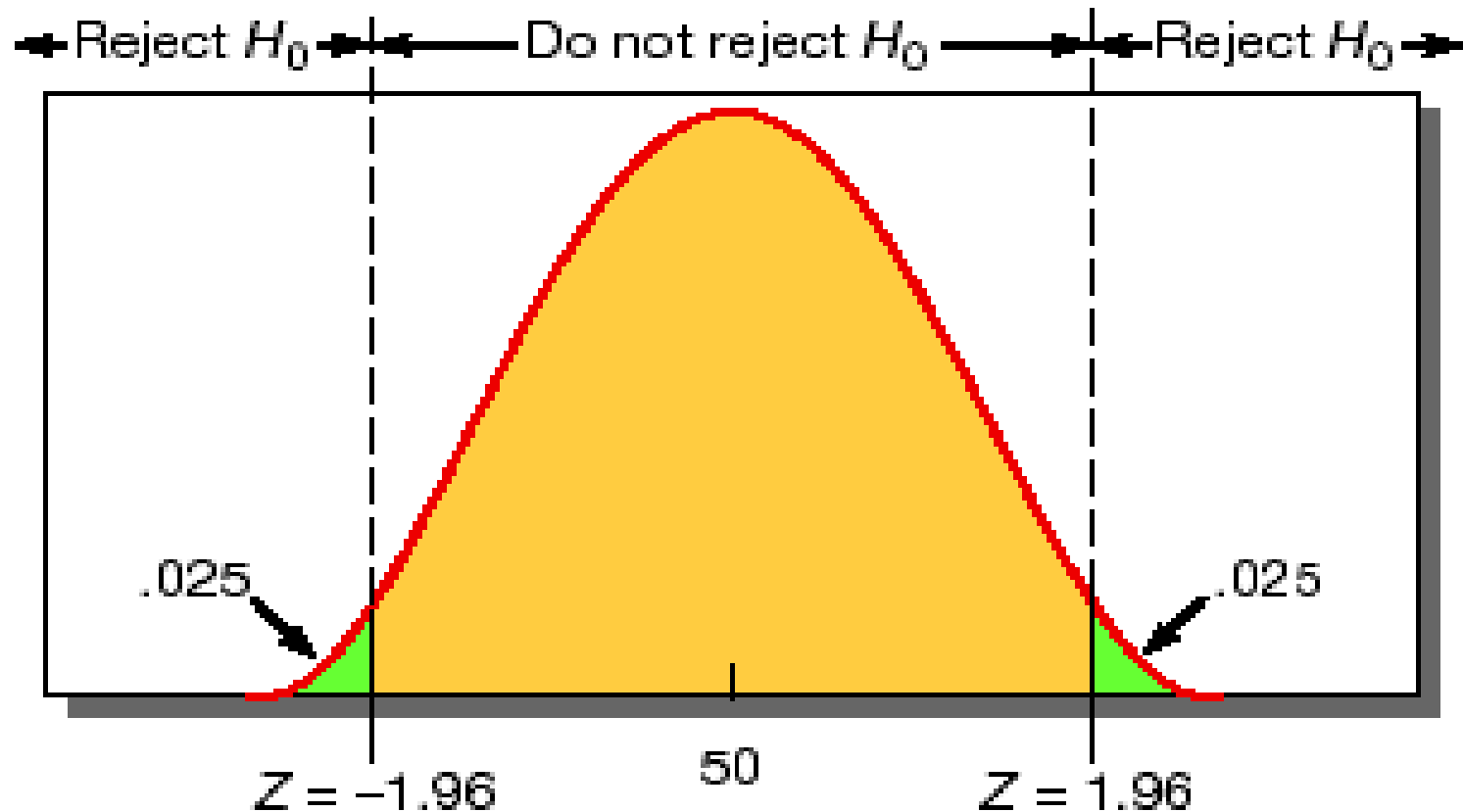




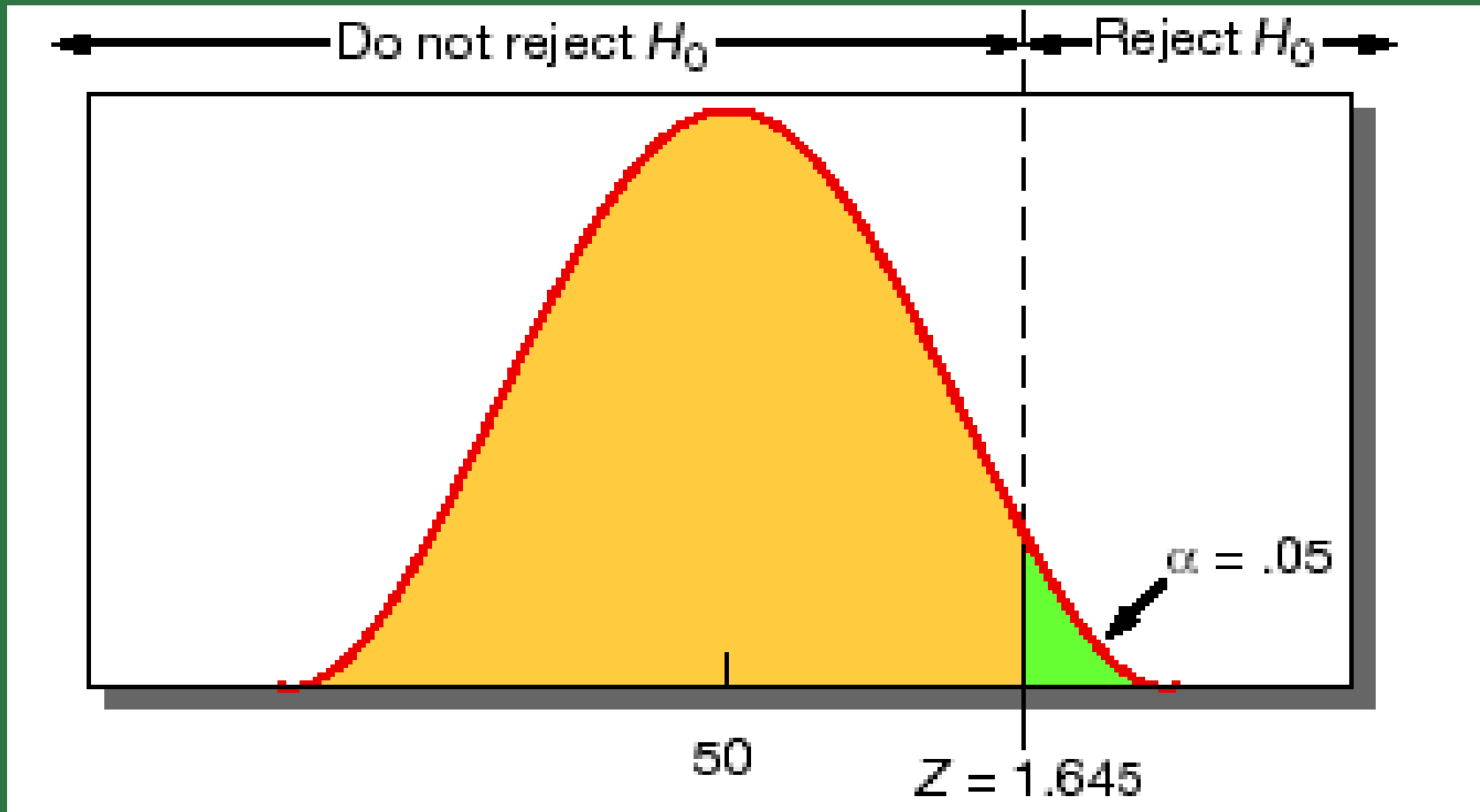
Types of Hypotheses

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

Two-Tailed Test of Significance



One-Tailed Test of Significance

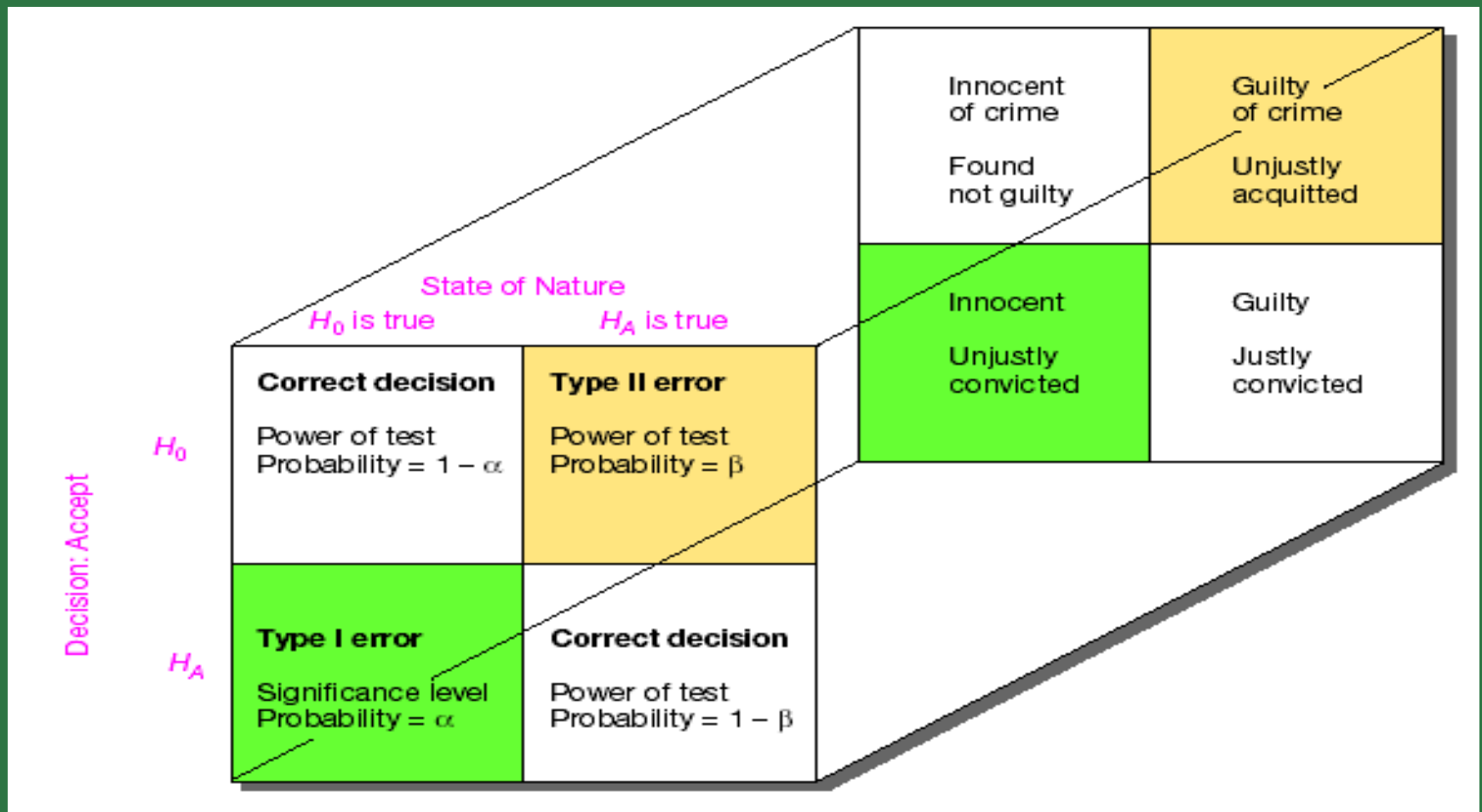




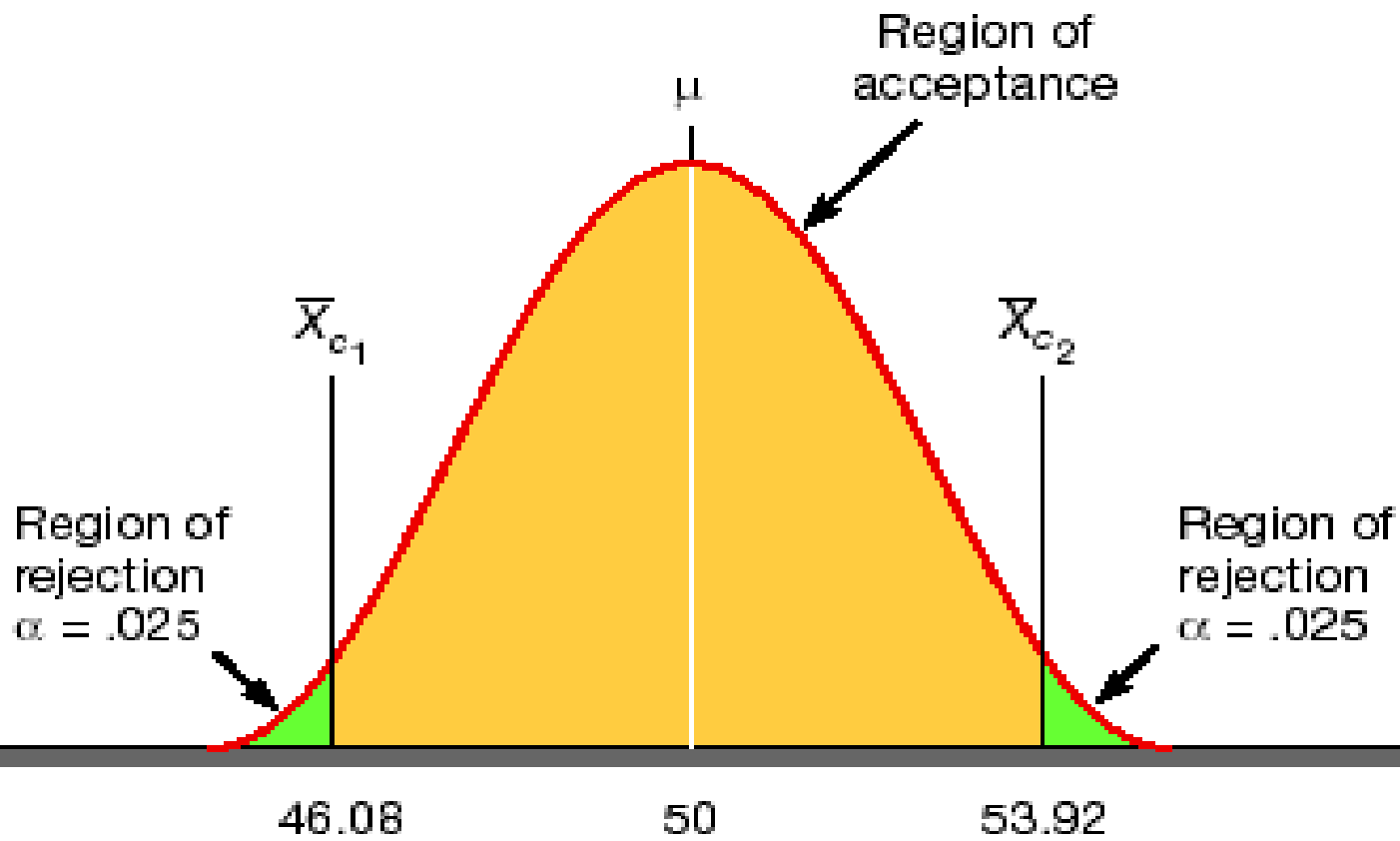
Decision Rule

*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

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

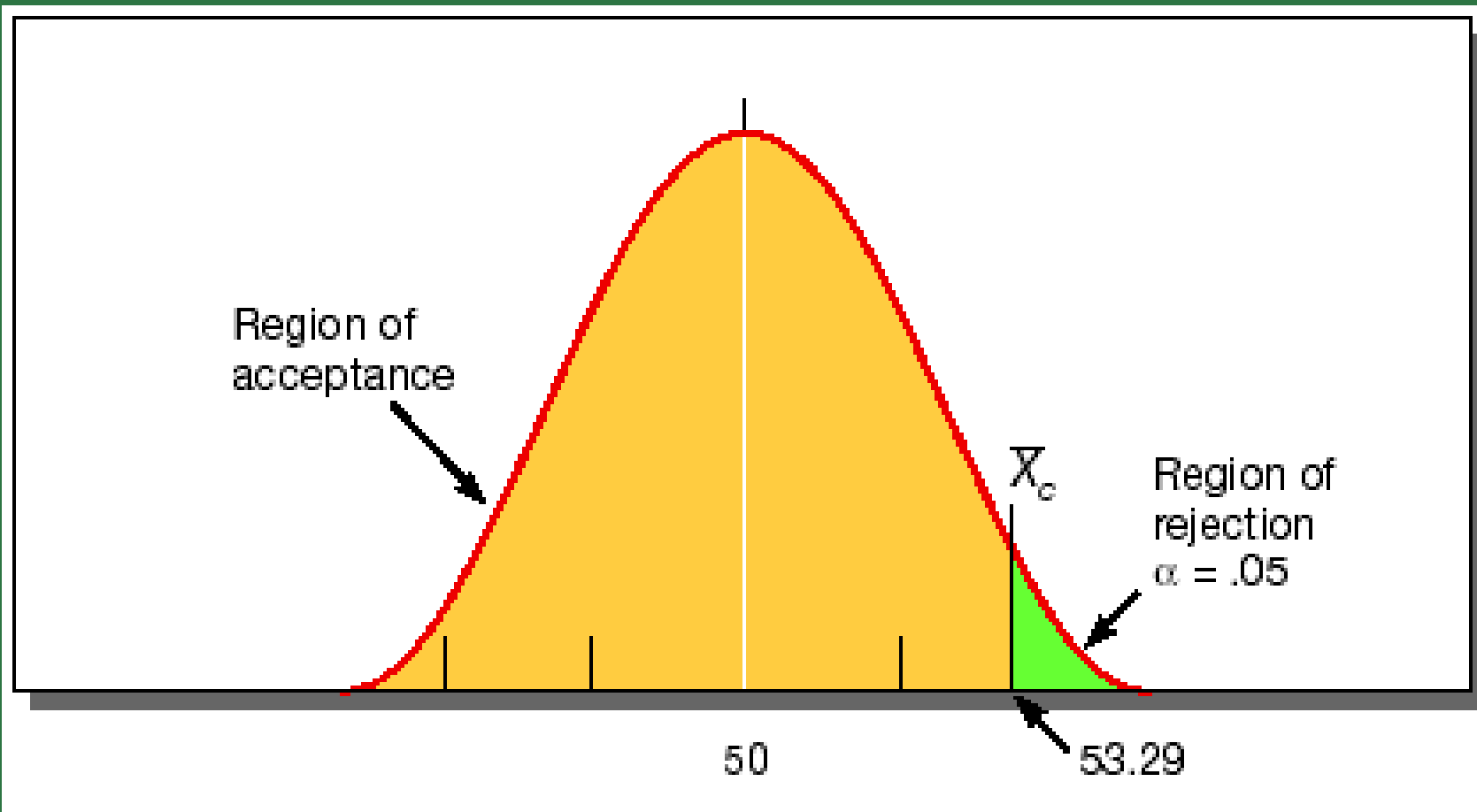
$$-1.96 = \frac{\bar{X}_c - 50}{2}$$

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

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

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

Exhibit 17-4 Probability of Making A Type I Error



Factors Affecting Probability of Committing a β Error

True value of parameter

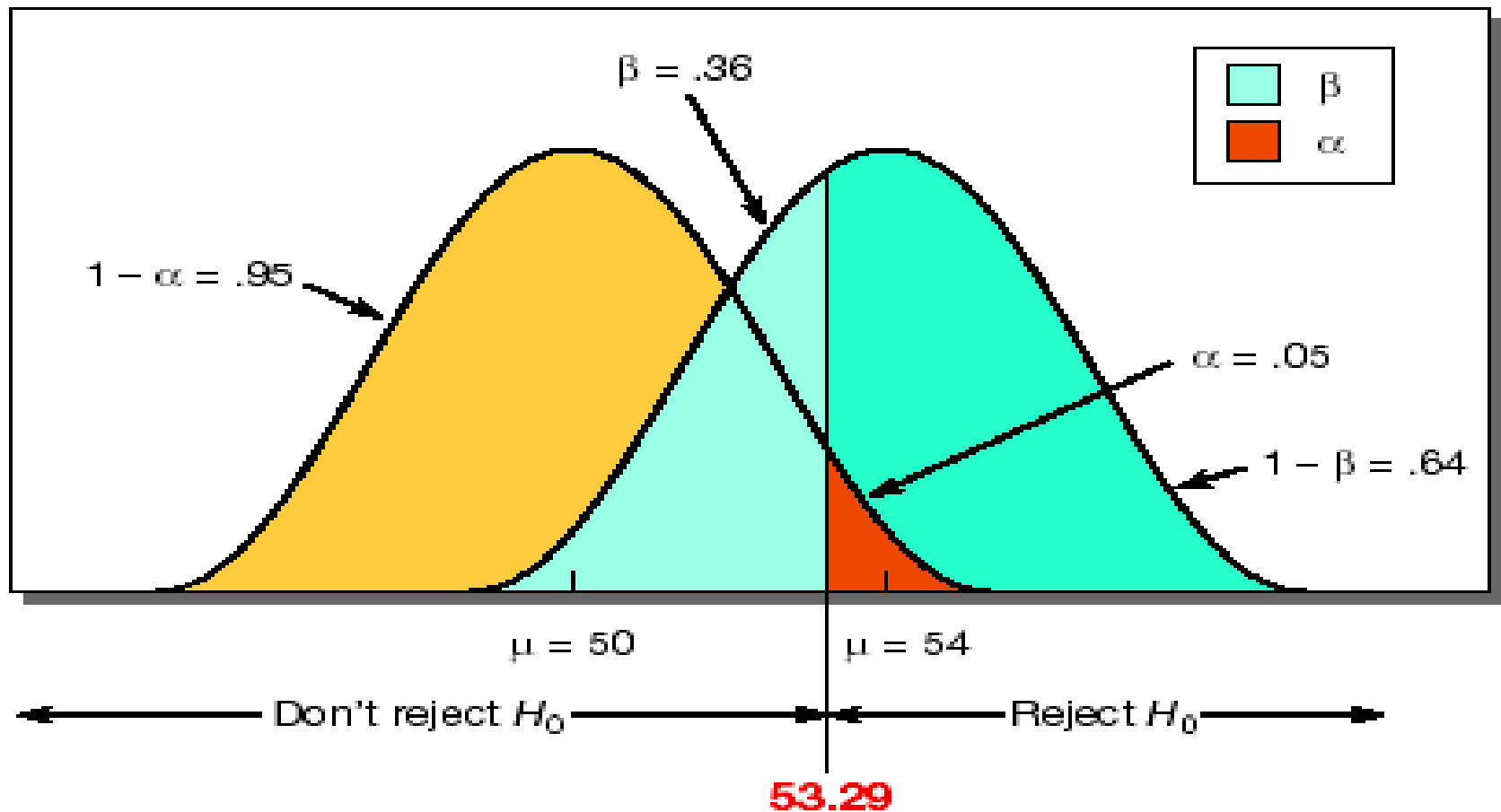
Alpha level selected

One or two-tailed test used

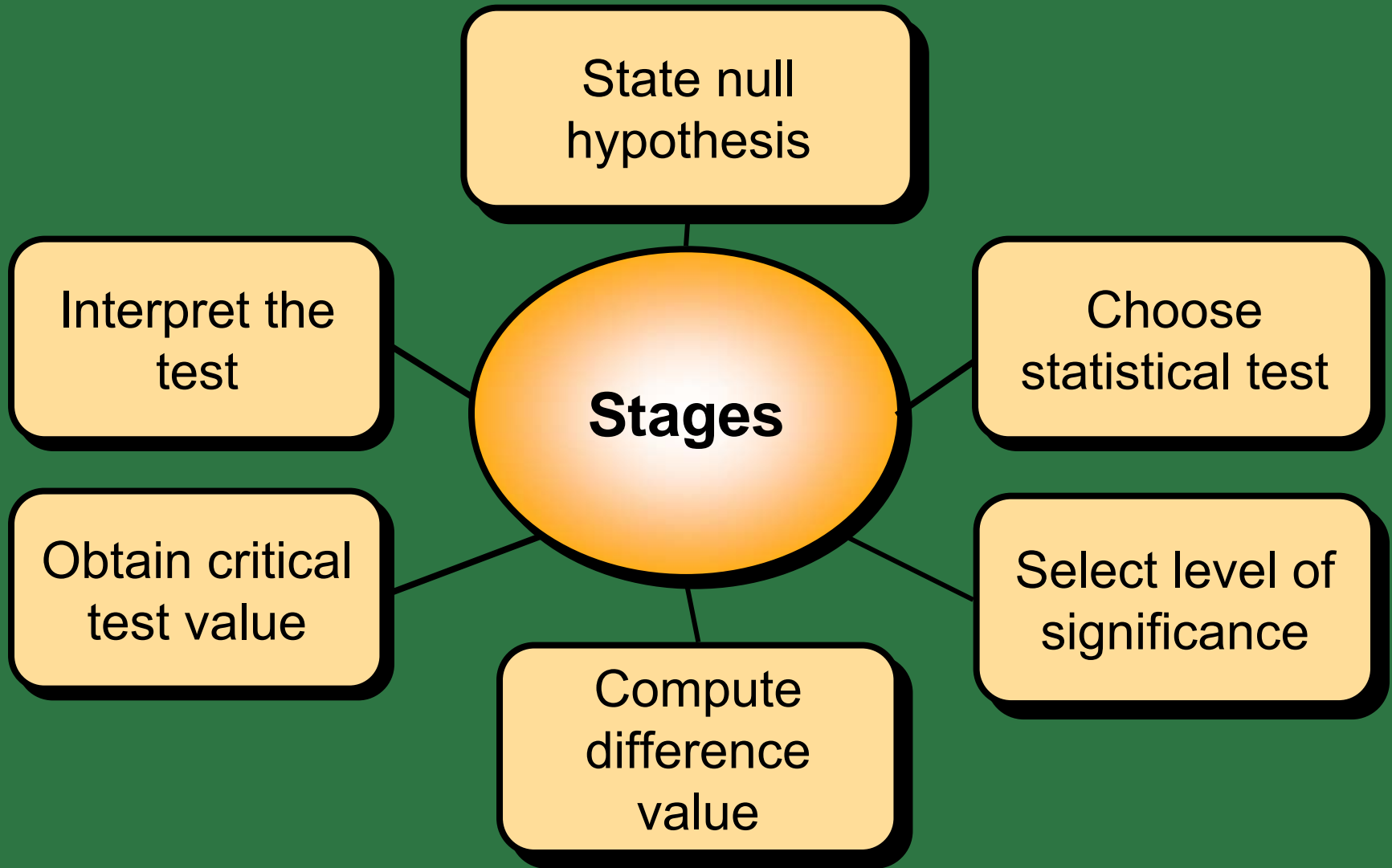
Sample standard deviation

Sample size

Probability of Making A Type II Error



Statistical Testing Procedures



Tests of Significance



Parametric

Nonparametric

Assumptions for Using Parametric Tests

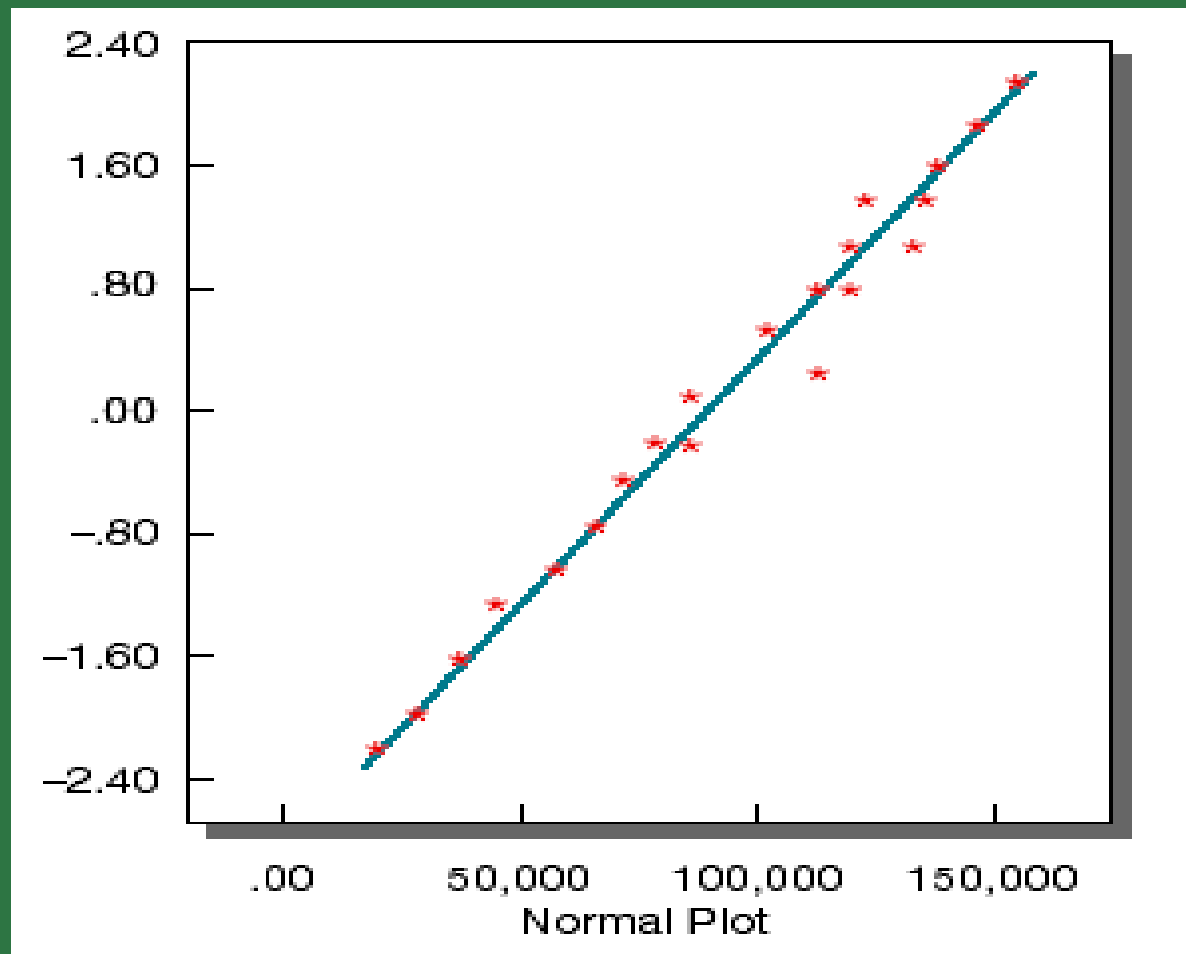
Independent observations

Normal distribution

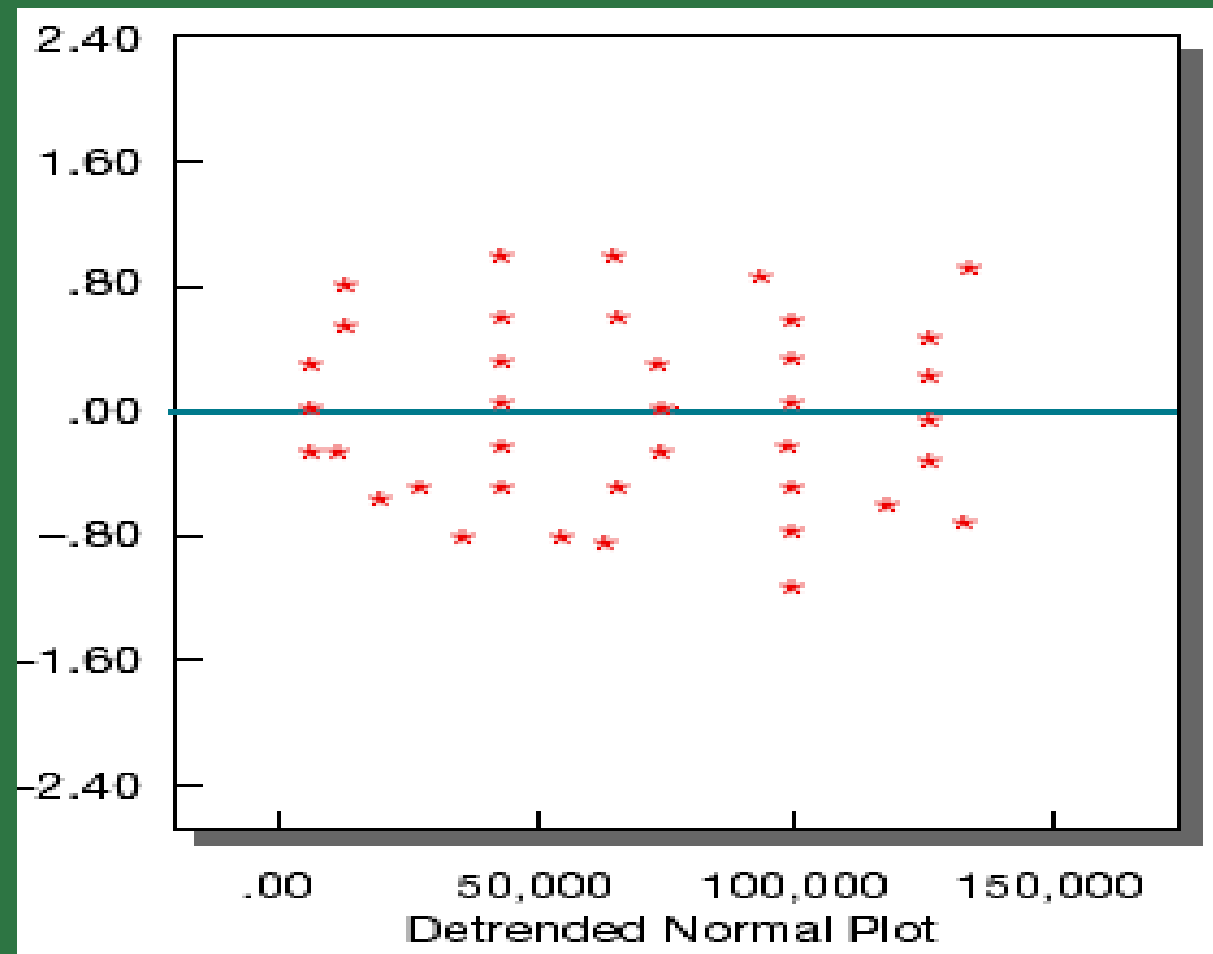
Equal variances

Interval or ratio scales

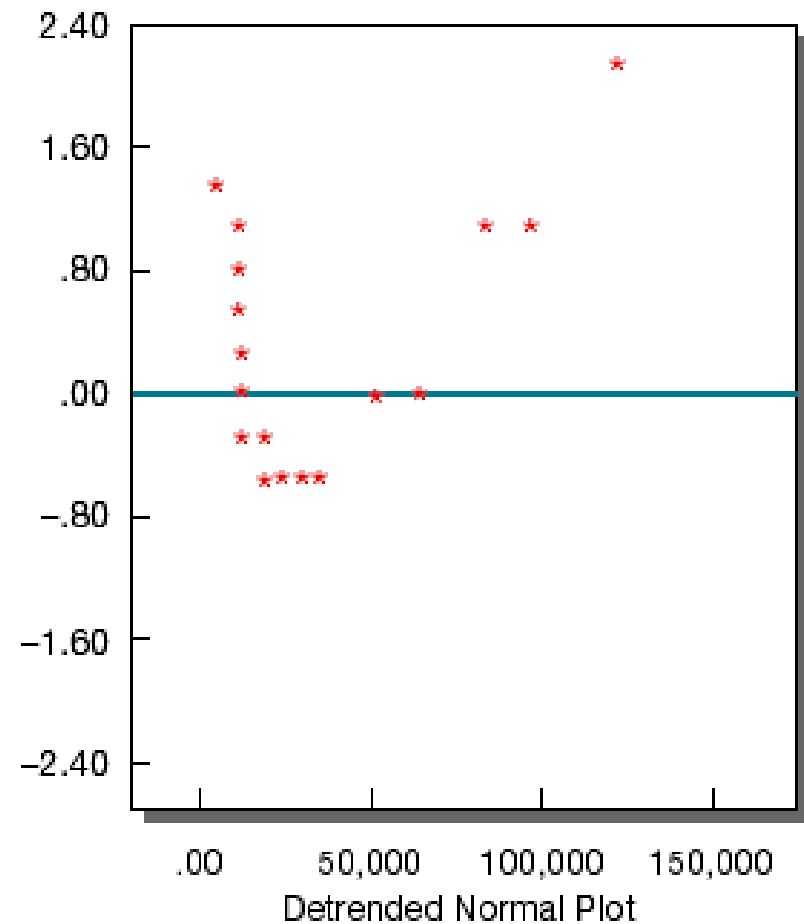
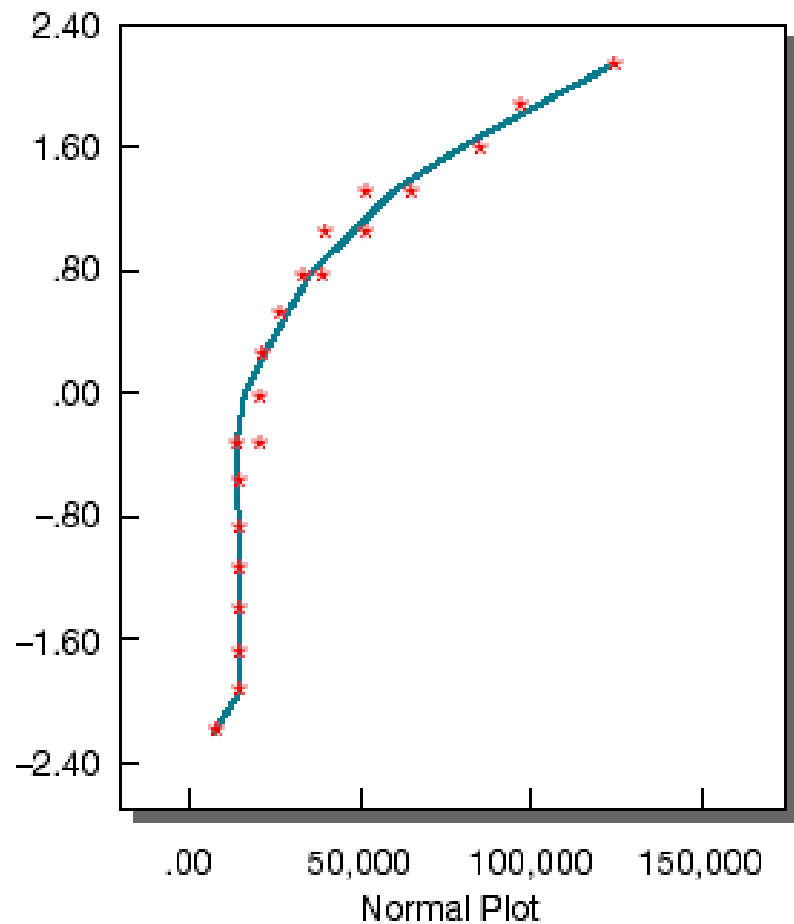
Probability Plot



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 k 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"> • t-test • Z test 	<ul style="list-style-type: none"> • t-test for paired samples 	<ul style="list-style-type: none"> • t-test • Z test 	<ul style="list-style-type: none"> • Repeated-measures ANOVA 	<ul style="list-style-type: none"> • One-way ANOVA • n-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



A diagram illustrating parametric tests. It features a dark green background with a large, light green, jagged-edged starburst shape in the center. Inside this starburst are two hexagonal boxes. The left box is light orange and contains the text 'Z-test'. The right box is a darker orange and contains the text 't-test'.

Z-test

t-test

One-Sample t -Test Example

Null	$H_0: = 50$ mpg
Statistical test	t -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	<u>15</u>	<u>30</u>	<u>15</u>	<u>9</u>
Total	60	200	100	60

One-Sample Chi-Square Example

Null	$H_0: 0 = E$
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	Ho: A sales = B sales
Statistical test	<i>t</i> -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
	Moderate	2,1 9 7.73	2,2 6 7.27	15
	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

(from Appendix C, Exhibit C-3)

SPSS Cross-Tab Procedure

INCOME BY POSSESSION OF MBA

INCOME	Count	MBA		Row Total
		Yes	No	
		1	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



A diagram illustrating the classification of two-related-samples tests. It features a dark green background with a large, light green, jagged-edged starburst shape in the center. Inside this starburst are two side-by-side hexagonal boxes. The left box is light orange and contains the word 'Parametric'. The right box is a darker orange and contains the word 'Nonparametric'.

Parametric

Nonparametric

Sales Data for Paired-Samples t-Test

<i>Company</i>	<i>Sales Year 2</i>	<i>Sales Year 1</i>	<i>Difference D</i>	<i>D²</i>
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.	t 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)

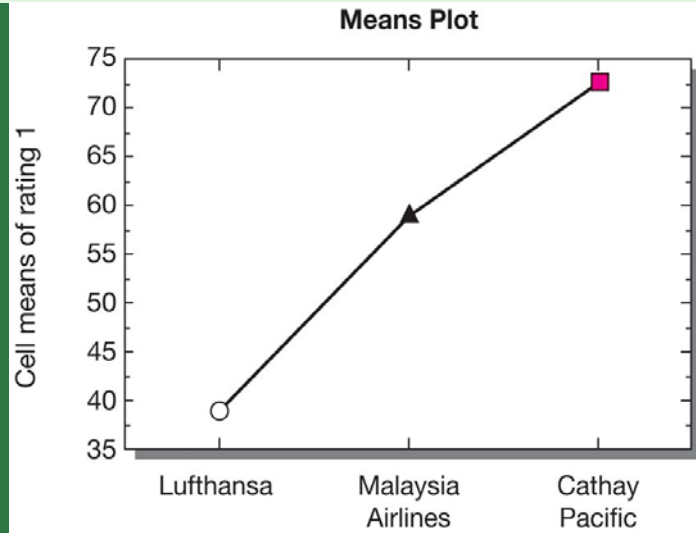
Post Hoc: Scheffe's S Multiple Comparison Procedure

	Verses	Diff	Crit. Diff.	p Value
Lufthansa	Malaysia Airlines	19,950	11.400	.00002
	Cathay Pacific	33.950	11.400	.00001
Malaysia Airlines	Cathay Pacific	14.000	11.400	.0122

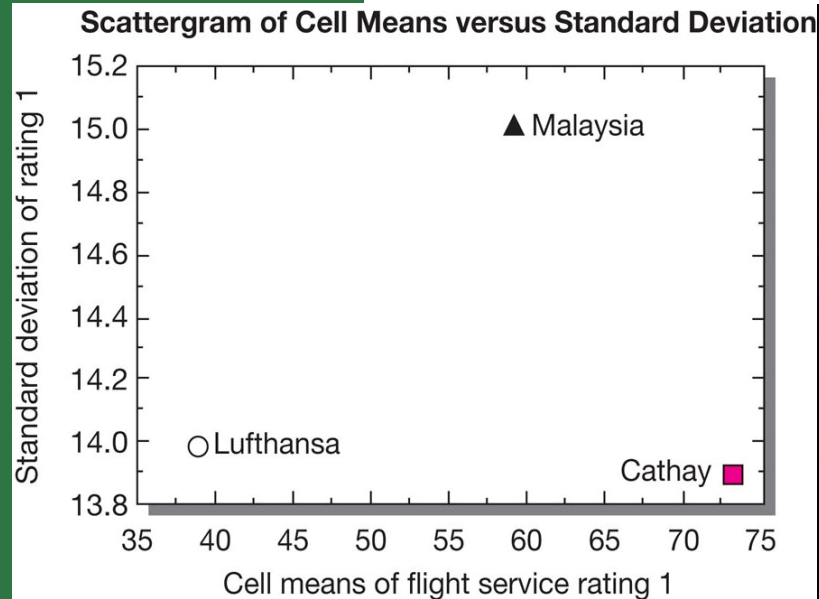
Multiple Comparison Procedures

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

<u>Model Summary</u>					
Source	d.f.	Sum of Squares	Mean Square	<i>F</i> Value	<i>p</i> 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		

<u>Means Table by Airline</u>				
	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


<u>Means Table Effect: Ratings</u>				
	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

- | | |
|---|---|
| <ul style="list-style-type: none">• a priori contrasts• Alternative hypothesis• Analysis of variance (ANOVA)• Bayesian statistics• Chi-square test• Classical statistics• Critical value• F ratio• Inferential statistics | <ul style="list-style-type: none">• 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

- | | |
|--|--|
| <ul style="list-style-type: none">• Null hypothesis• Observed significance level• One-sample tests• One-tailed test• p value• Parametric tests• Power of the test• Practical significance | <ul style="list-style-type: none">• Region of acceptance• Region of rejection• Statistical significance• t distribution• Trials• t-test• Two-independent-samples tests |
|--|--|

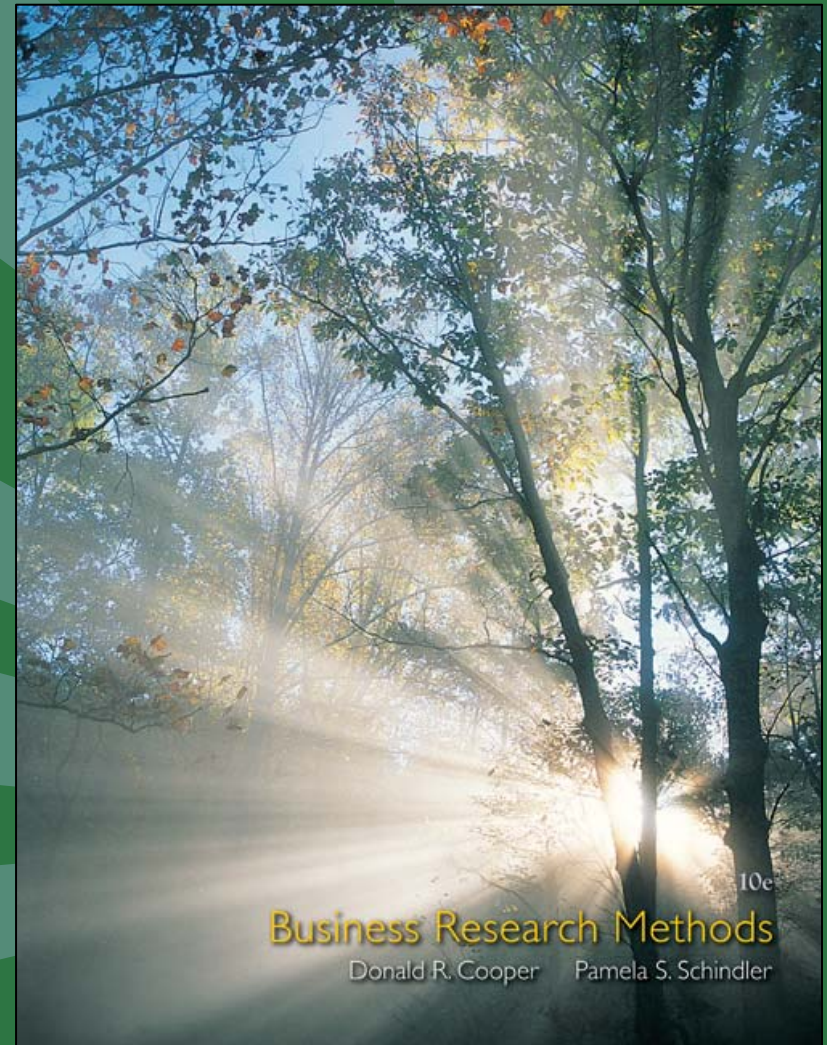



Key Terms

- | | |
|--|---|
| <ul style="list-style-type: none">• Two-related-samples tests• Two-tailed test• Type I error | <ul style="list-style-type: none">• 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

40

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

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the shades of gray complete the masterpiece.



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The Fine Art of Marketing Research

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.



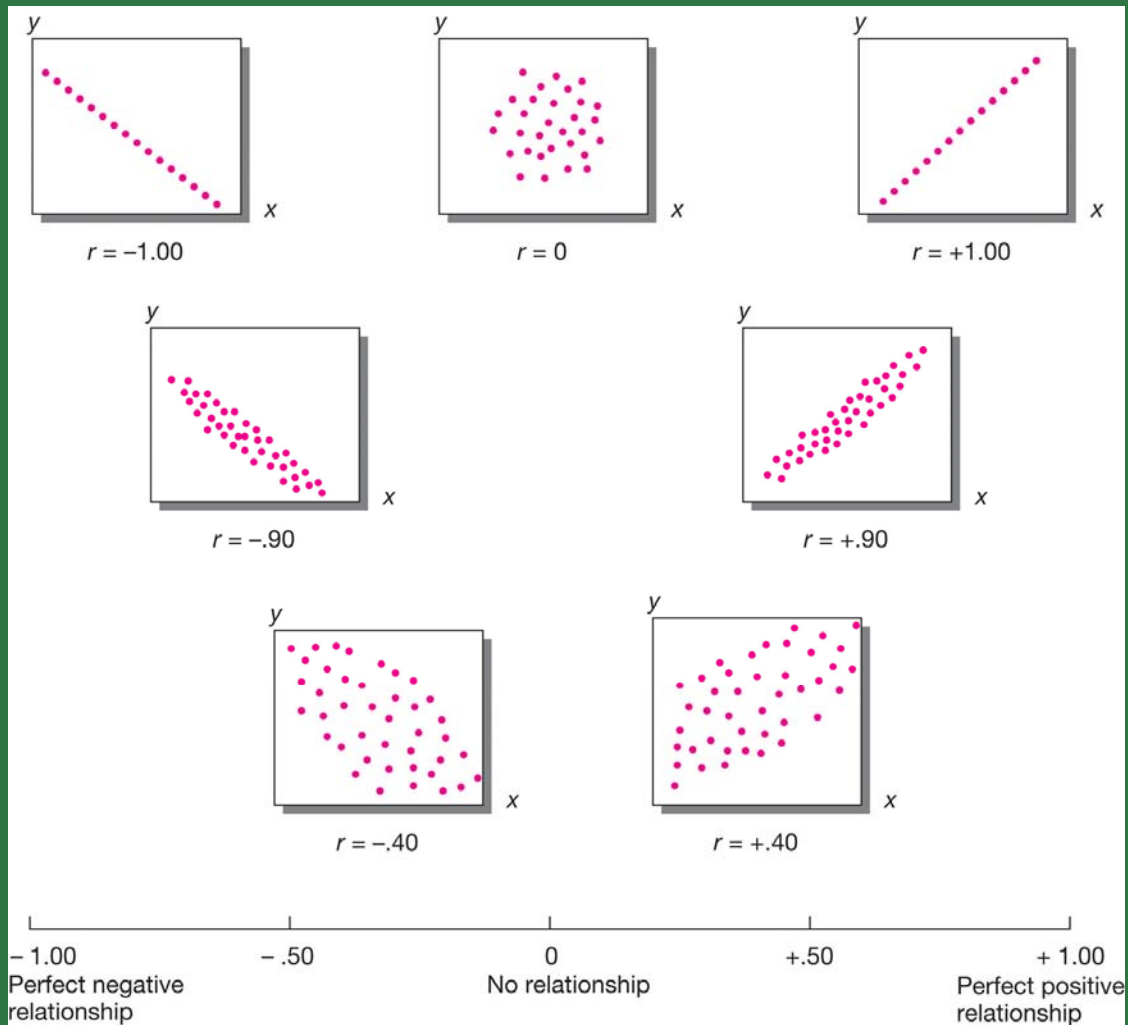
Pearson's Product Moment Correlation r

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

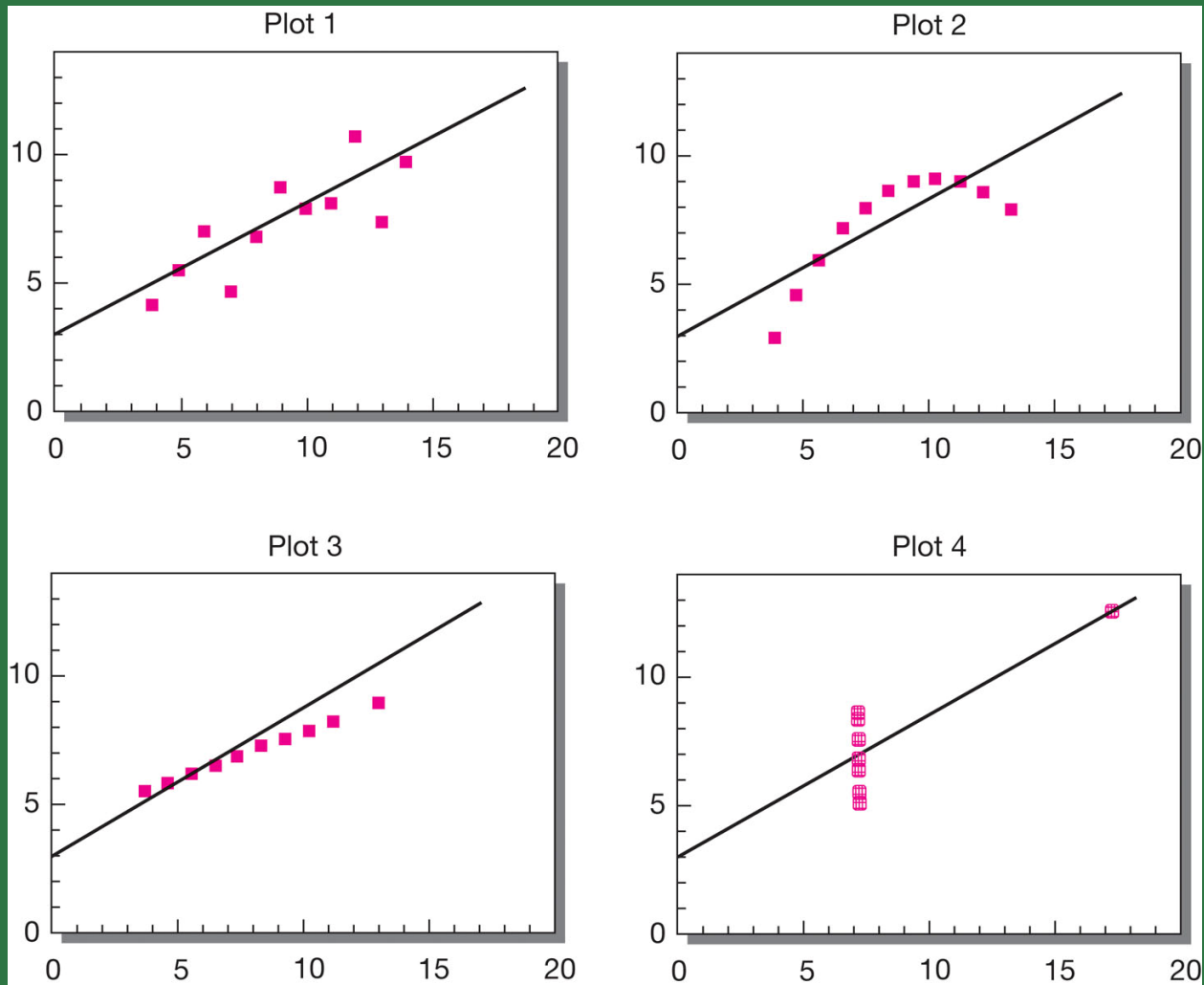
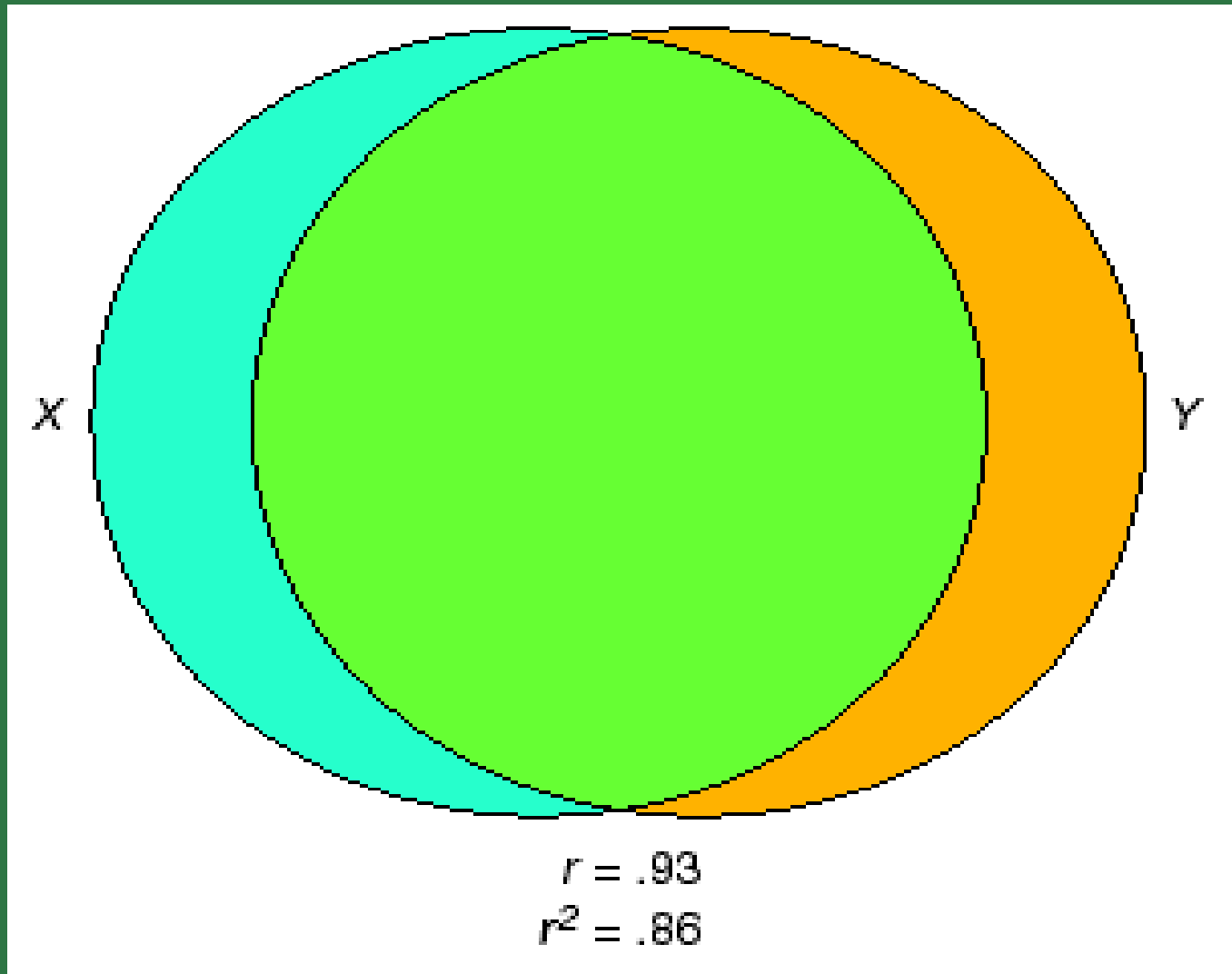


Diagram of Common Variance



Interpretation of Correlations

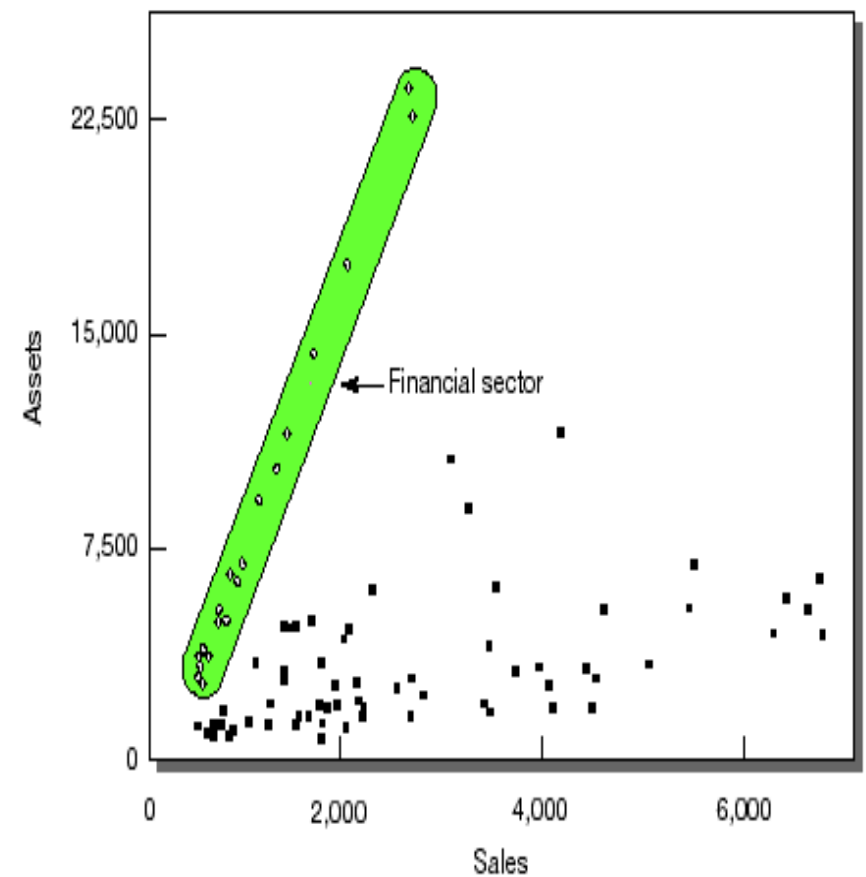
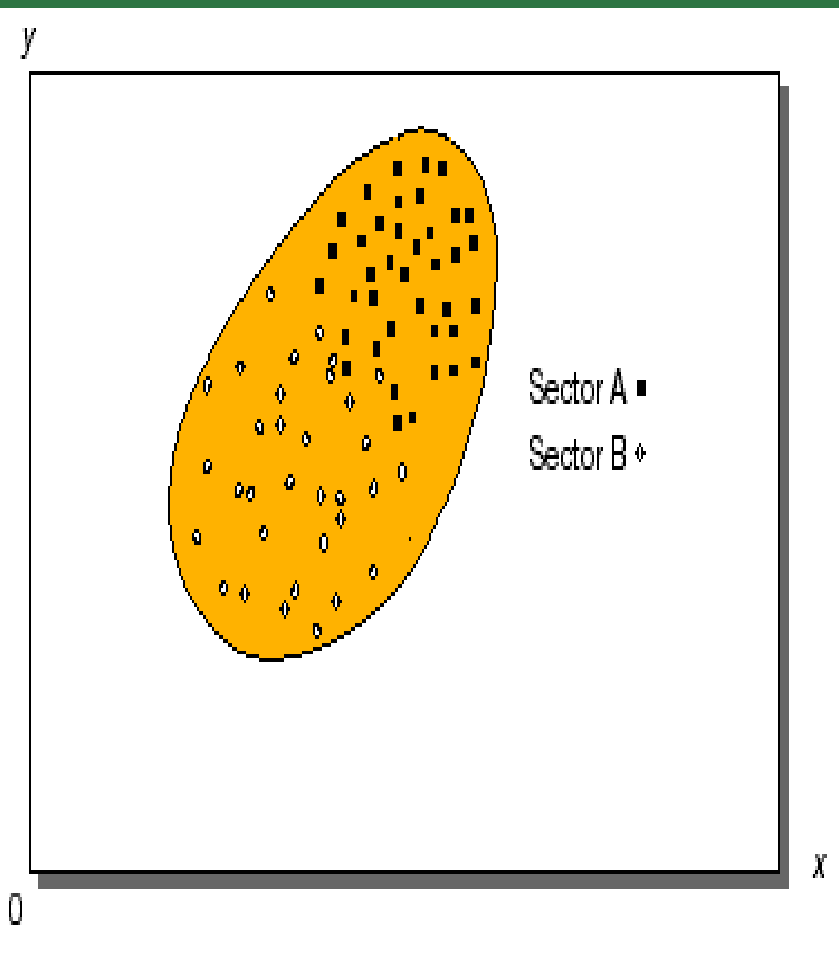
X causes Y


Y causes X

X and Y are activated by
one or more other variables

X and Y influence each
other reciprocally

Artifact Correlations





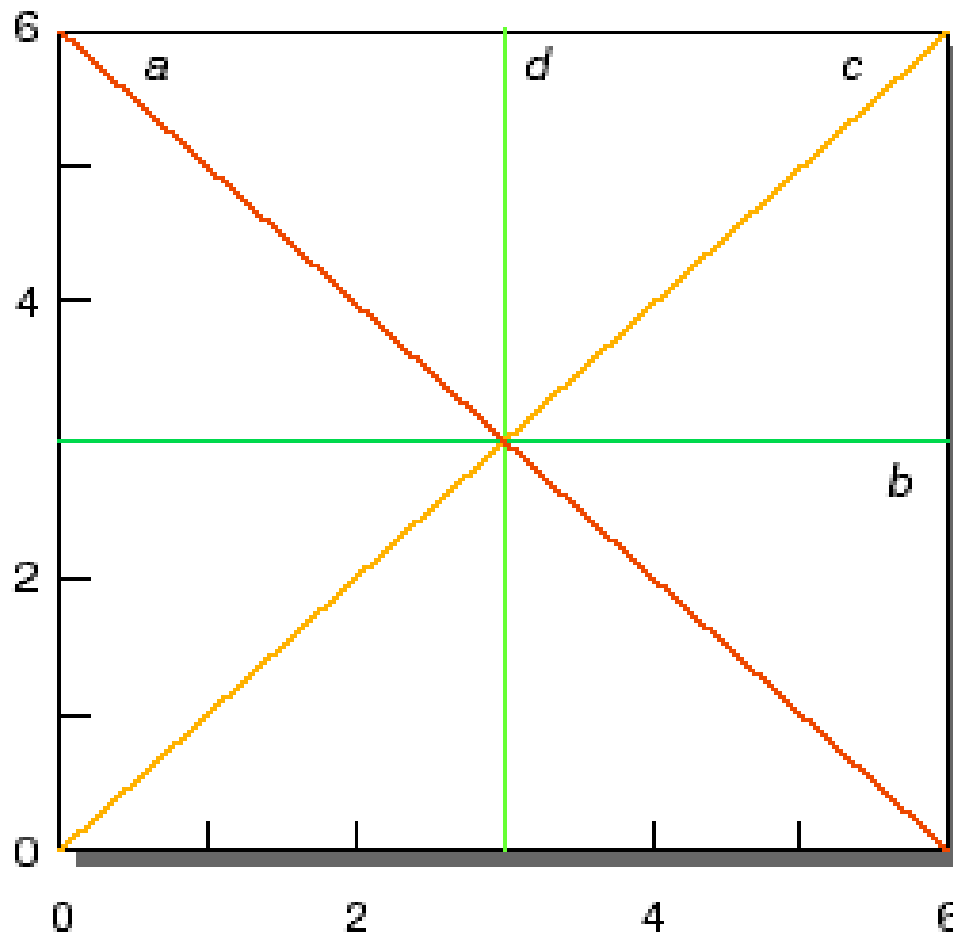
Interpretation of Coefficients

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

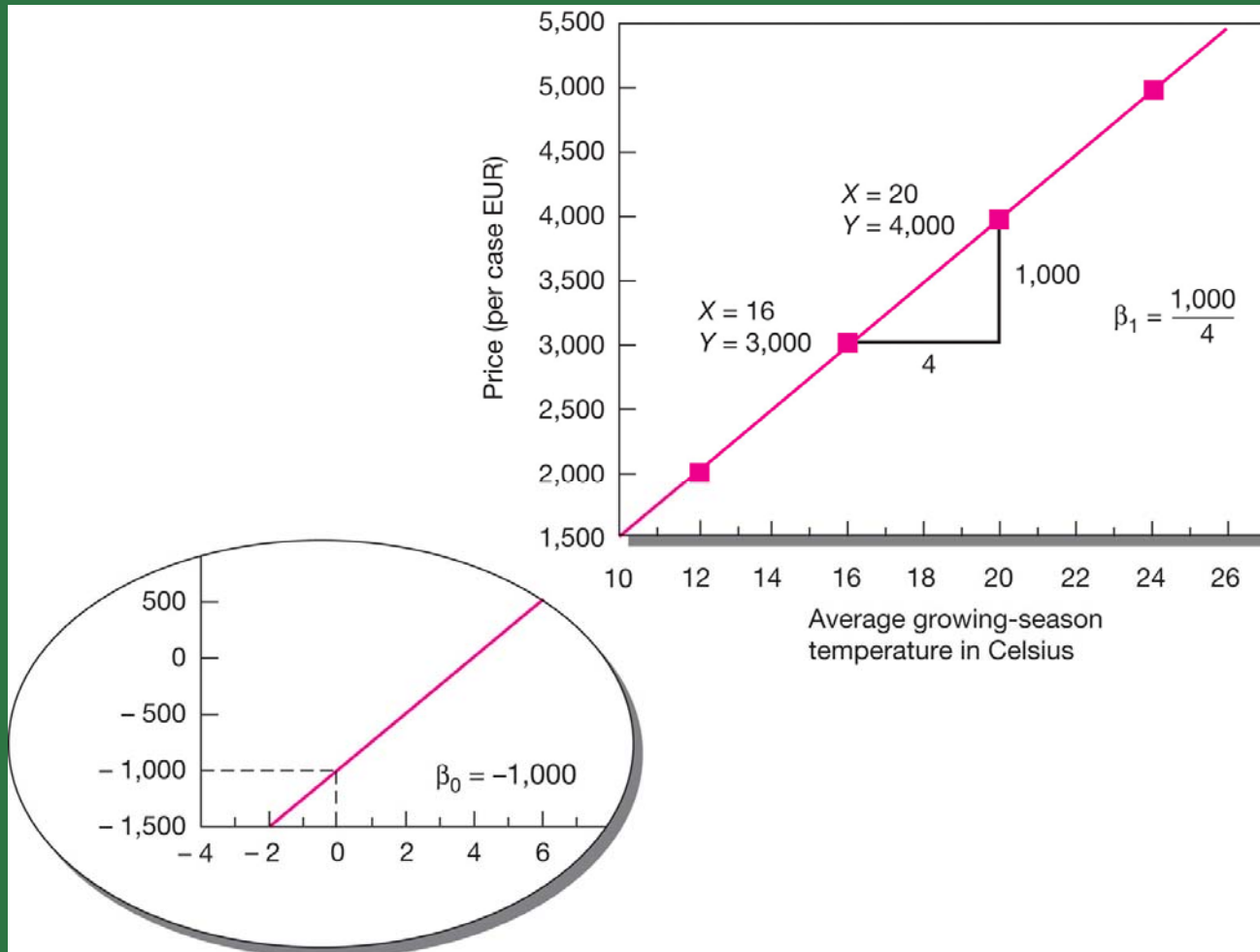


Line	Slope
<i>a</i>	-1
<i>b</i>	0
<i>c</i>	+1
<i>d</i>	∞

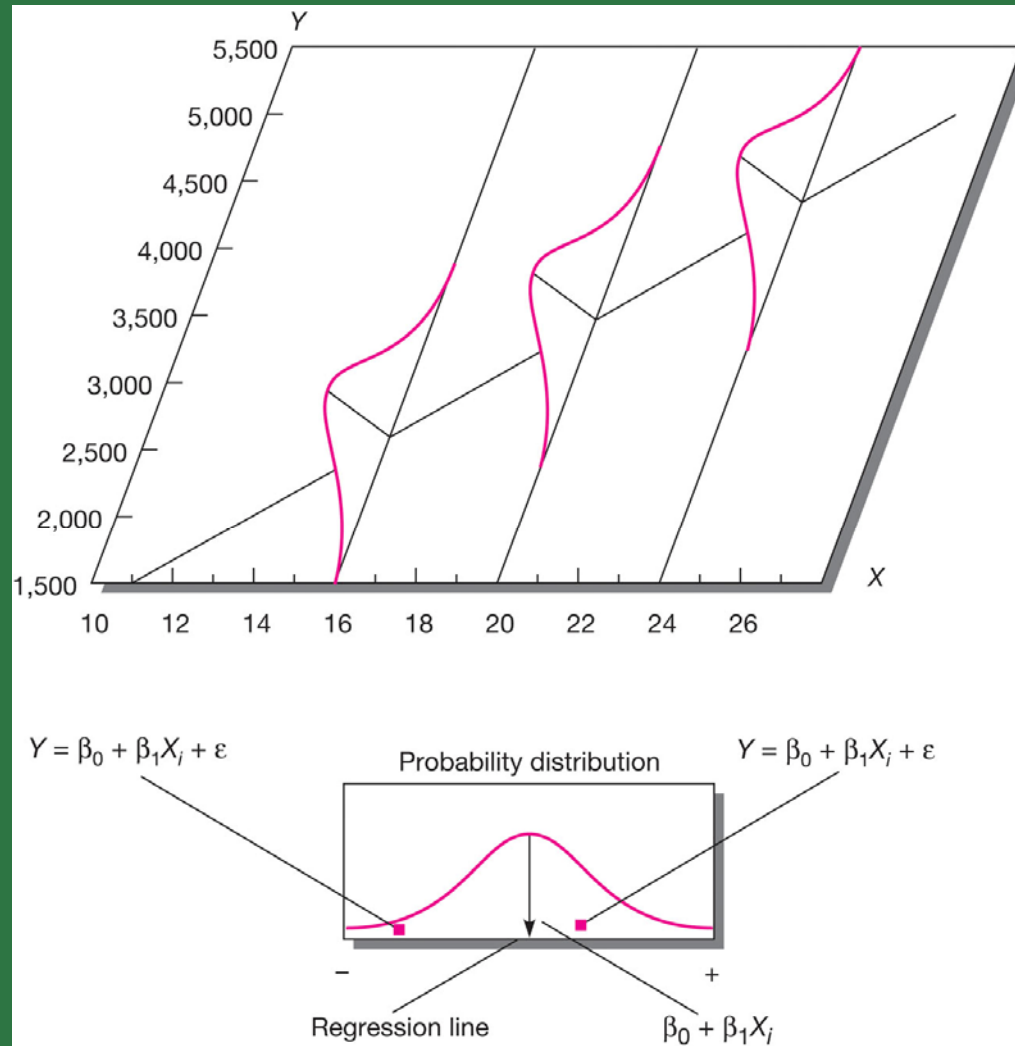
Concept Application

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

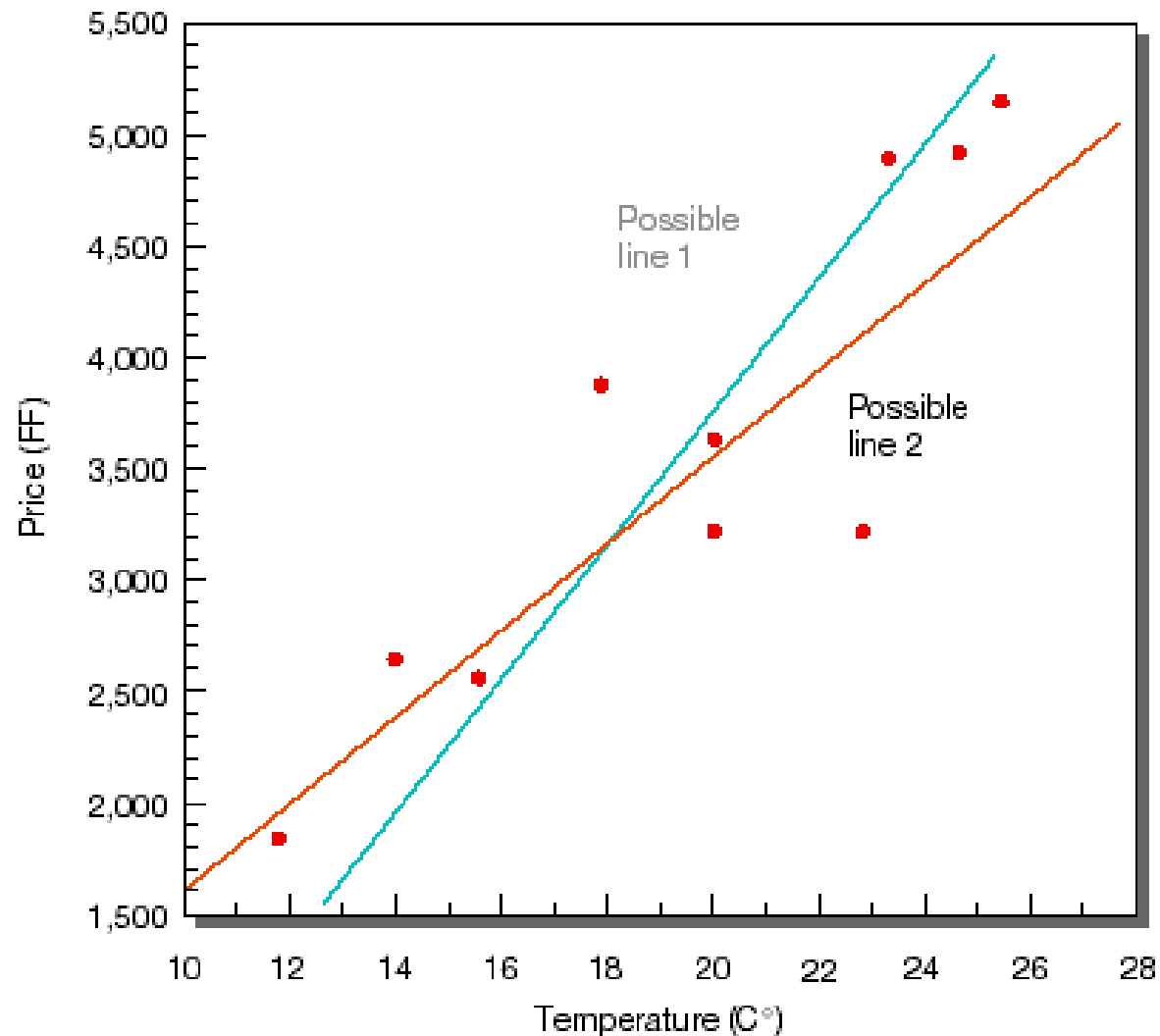
Plot of Wine Price by Average Temperature



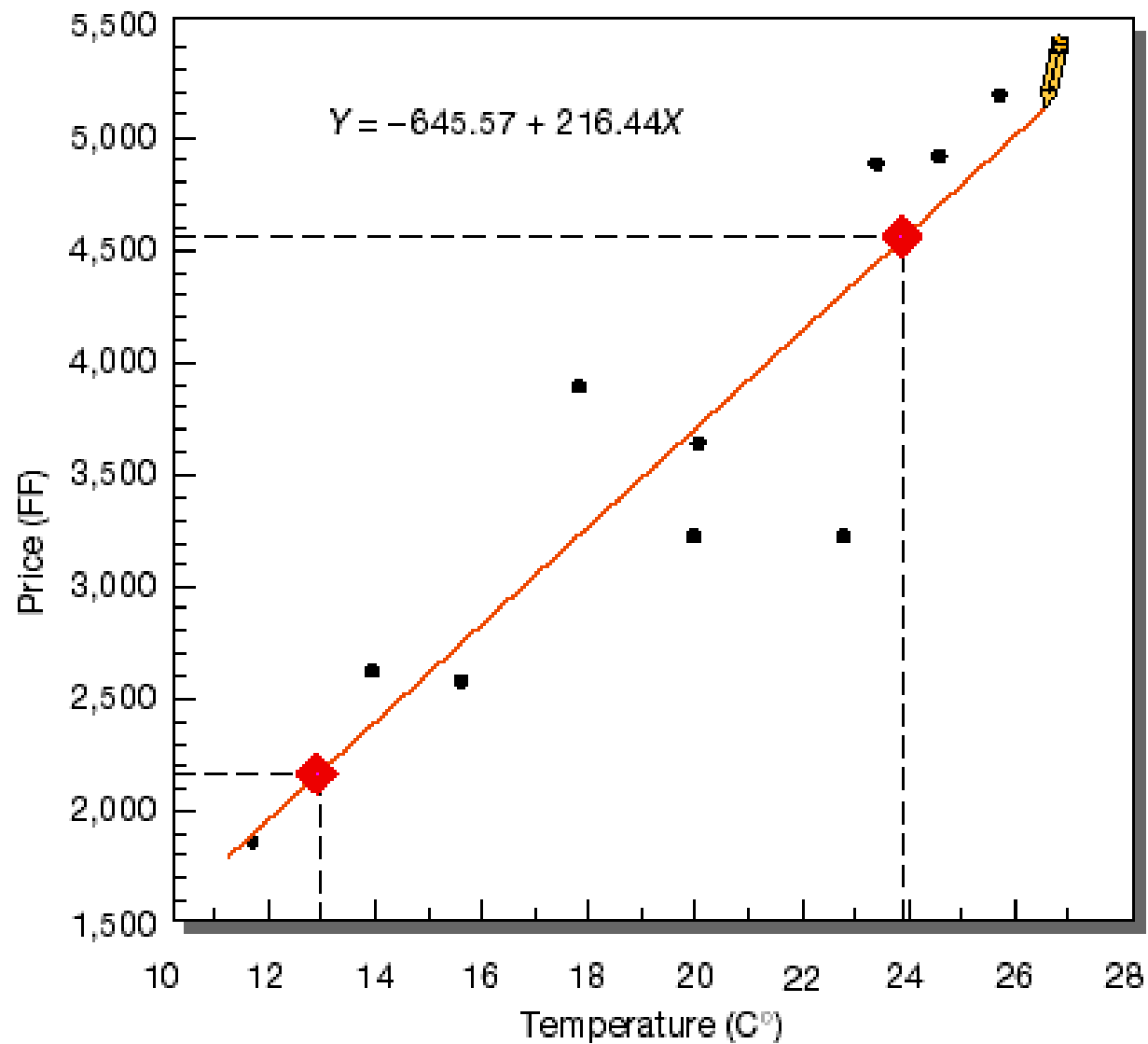
Distribution of Y for Observation of X



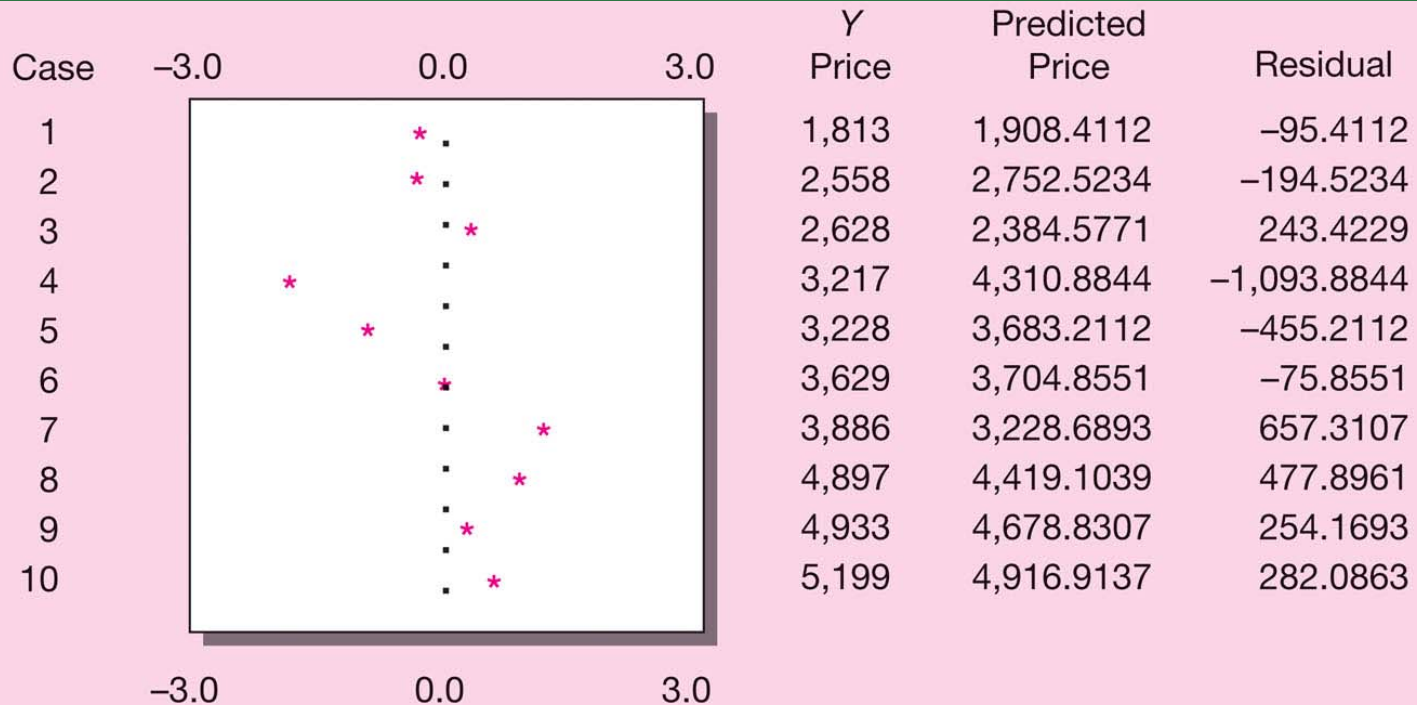
Wine Price Study Example



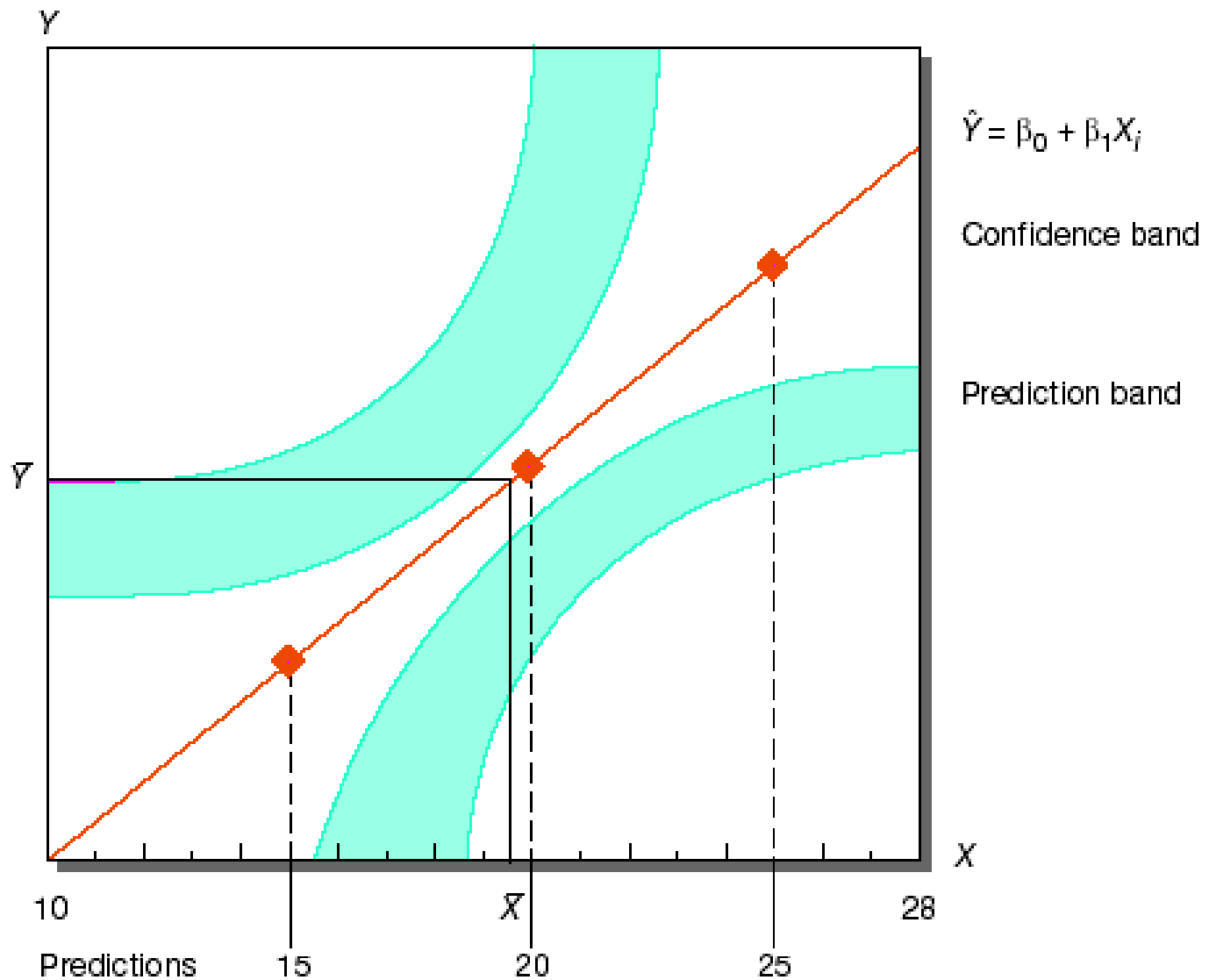
Least Squares Line: Wine Price Study



Plot of Standardized Residuals



Prediction and Confidence Bands



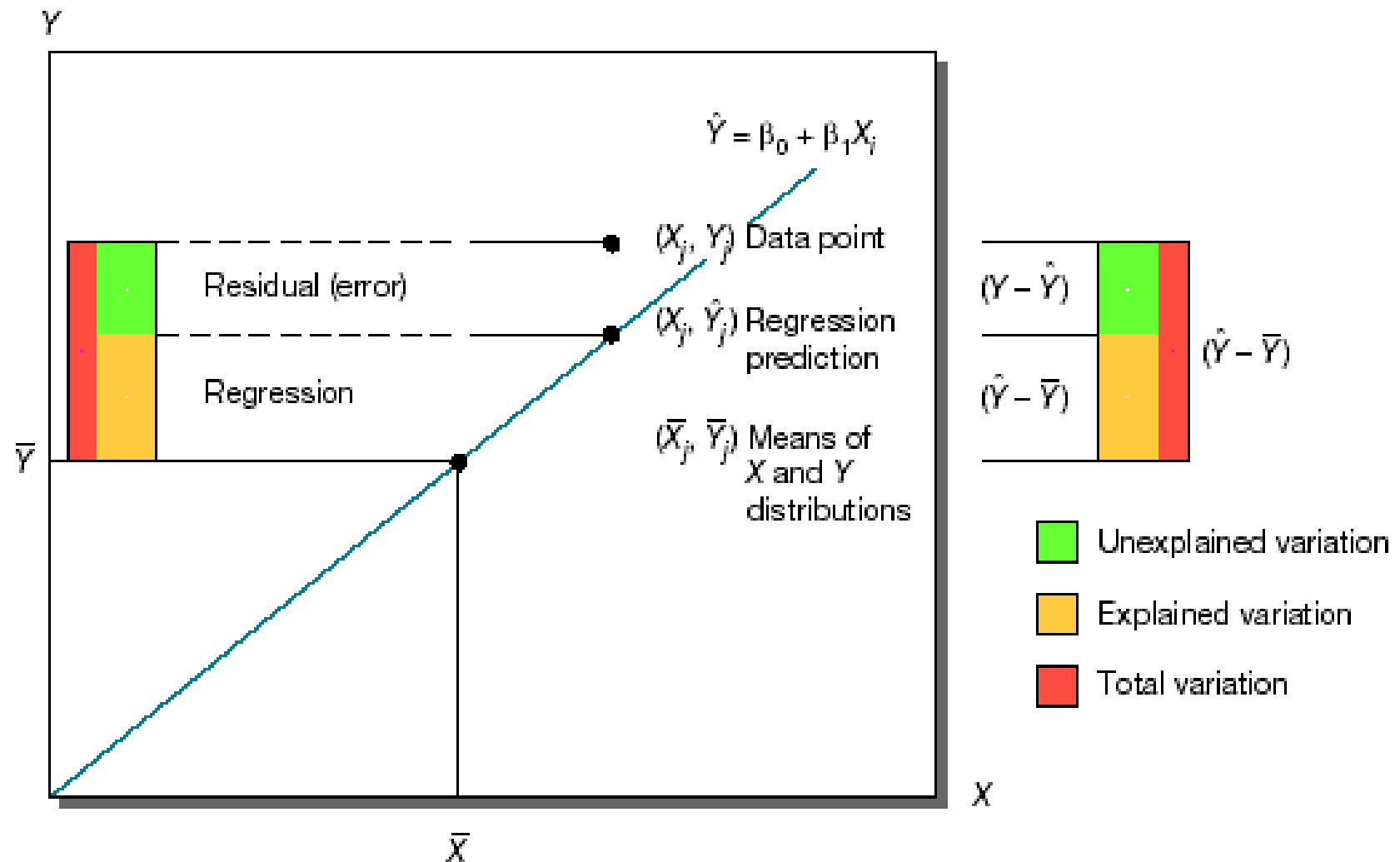
Testing Goodness of Fit

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				
Direct Mail	Count	Yes	No	Row Total
	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 90 82.0	1,2 20 18.0	110
	White collar	2,1 60 43.0	2,2 80 57.0	140
	Blue collar	3,1 30 20.0	3,2 120 80.0	150
Column Total		180 45.0%	220 55.0%	400 100.0%

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.

Lower Middle Upper

Total pairs

Fitness

H

M

L

70

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

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

20
26
24

34 16 20 70

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


Total tied fitness

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

Total tied management


KDL Data for Spearman's Rho

	Rank By			
Applicant	Panel x	Psychologist y	d	d^2
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

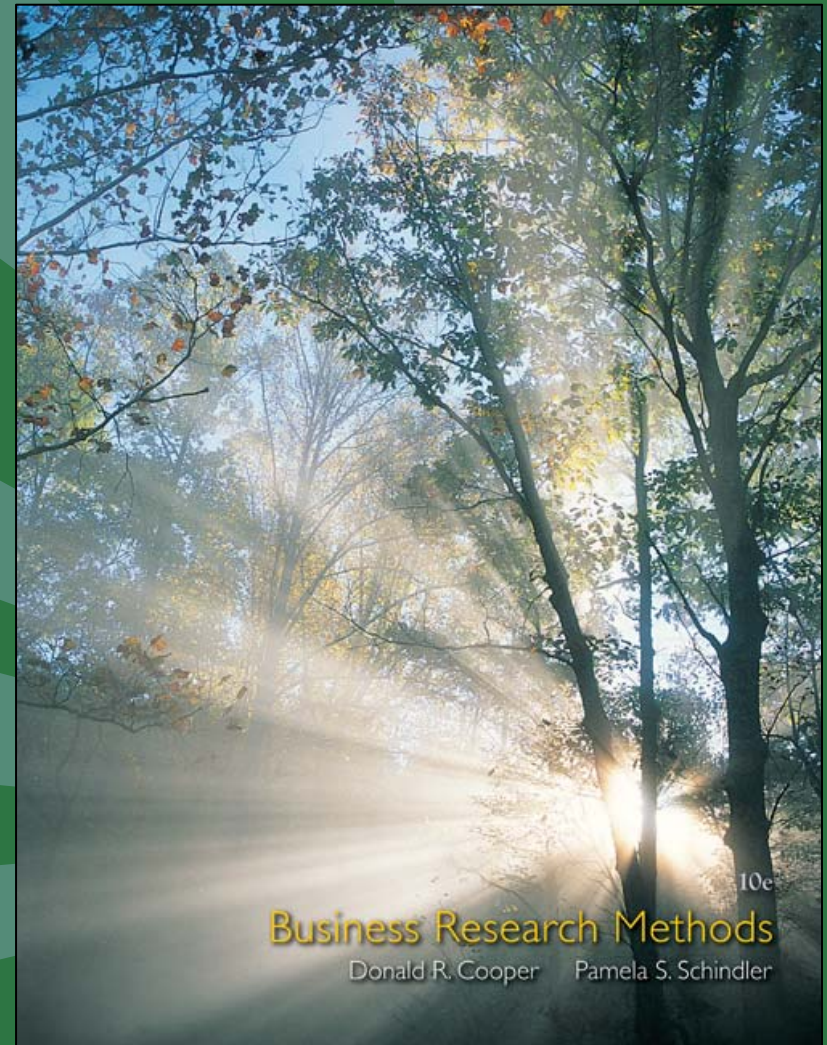
Key Terms (cont.)


- Intercept
- Slope
- Residual

- Scatterplot
- Simple prediction
- τ

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

49

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

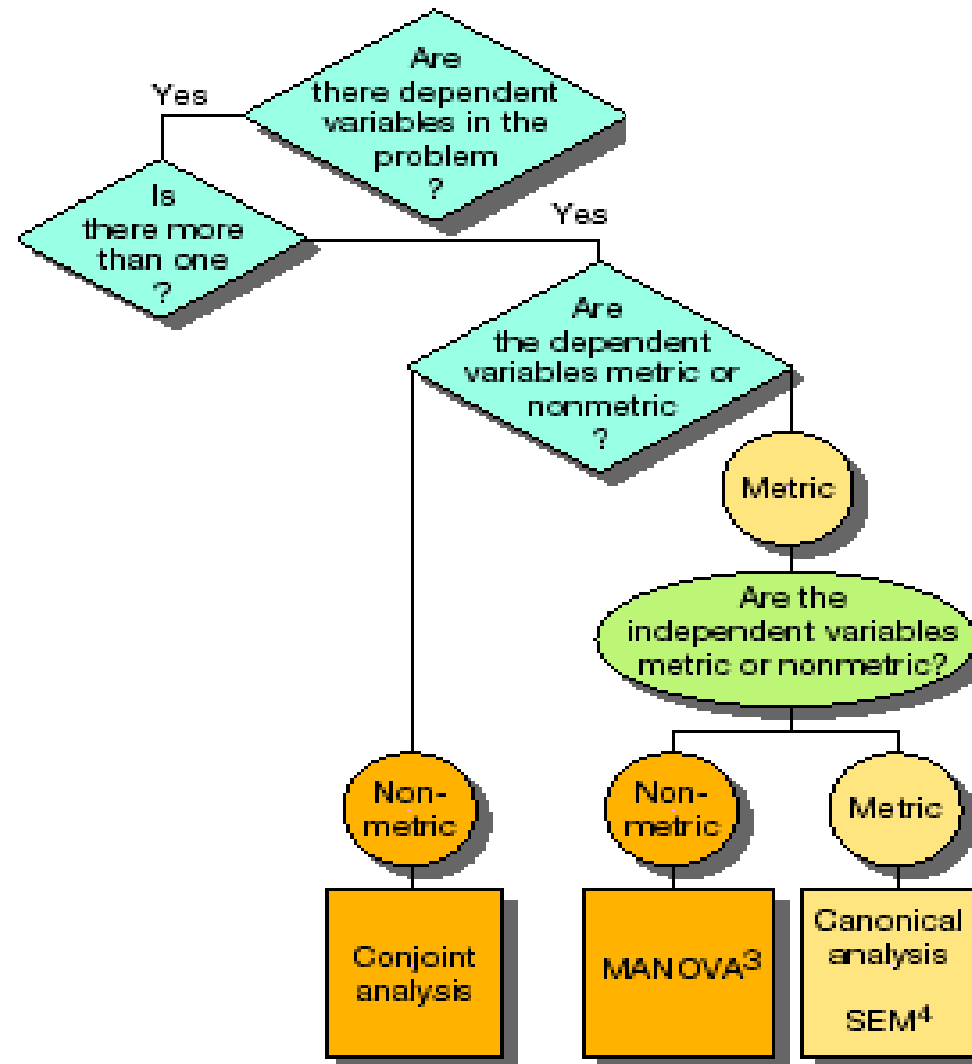


The diagram features a dark green background. In the center, there is a light green, multi-pointed star-like shape with a black outline. Inside this star, there are two side-by-side hexagonal shapes. The left hexagon is light orange and contains the word 'Dependency'. The right hexagon is a darker orange and contains the word 'Interdependency'.

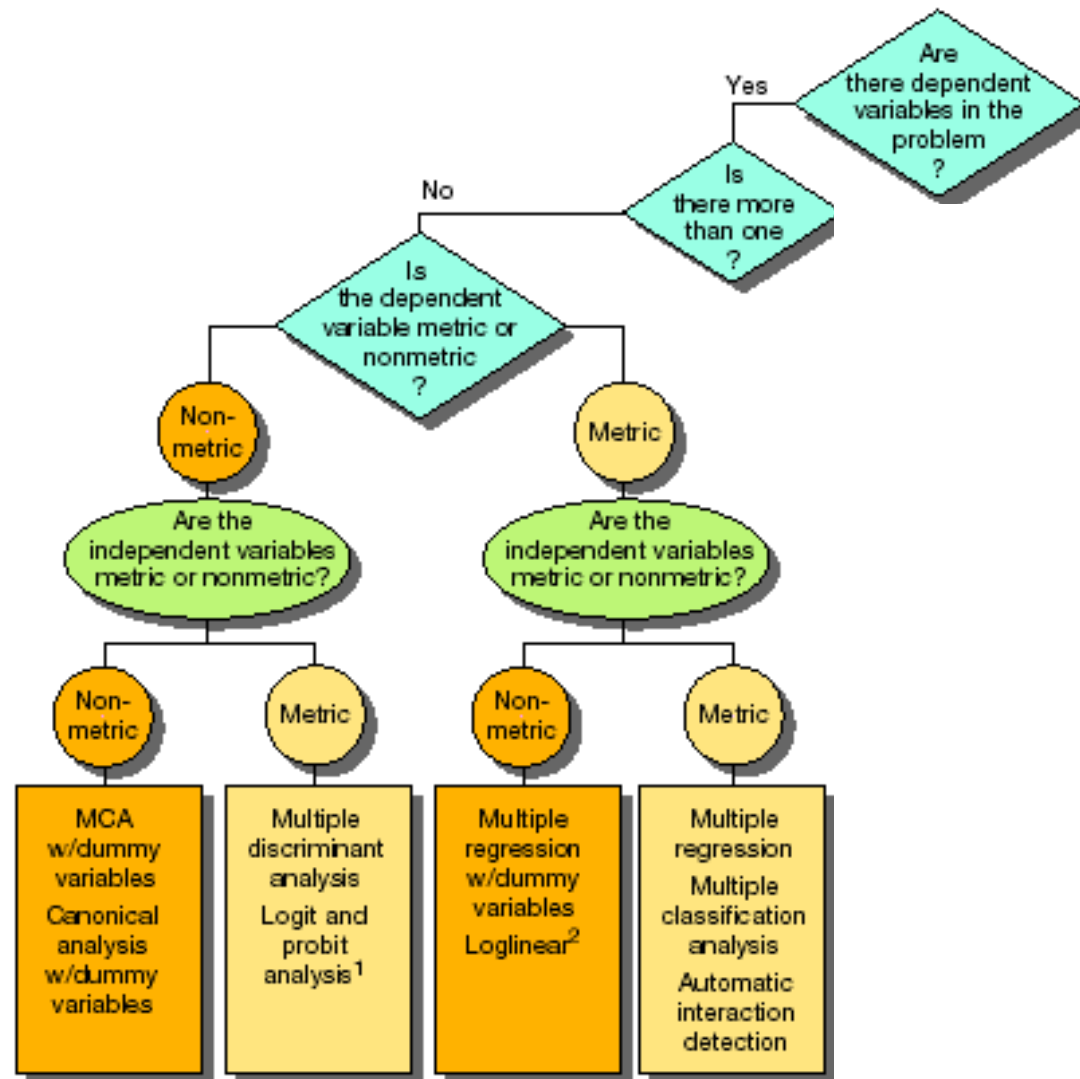
Dependency

Interdependency

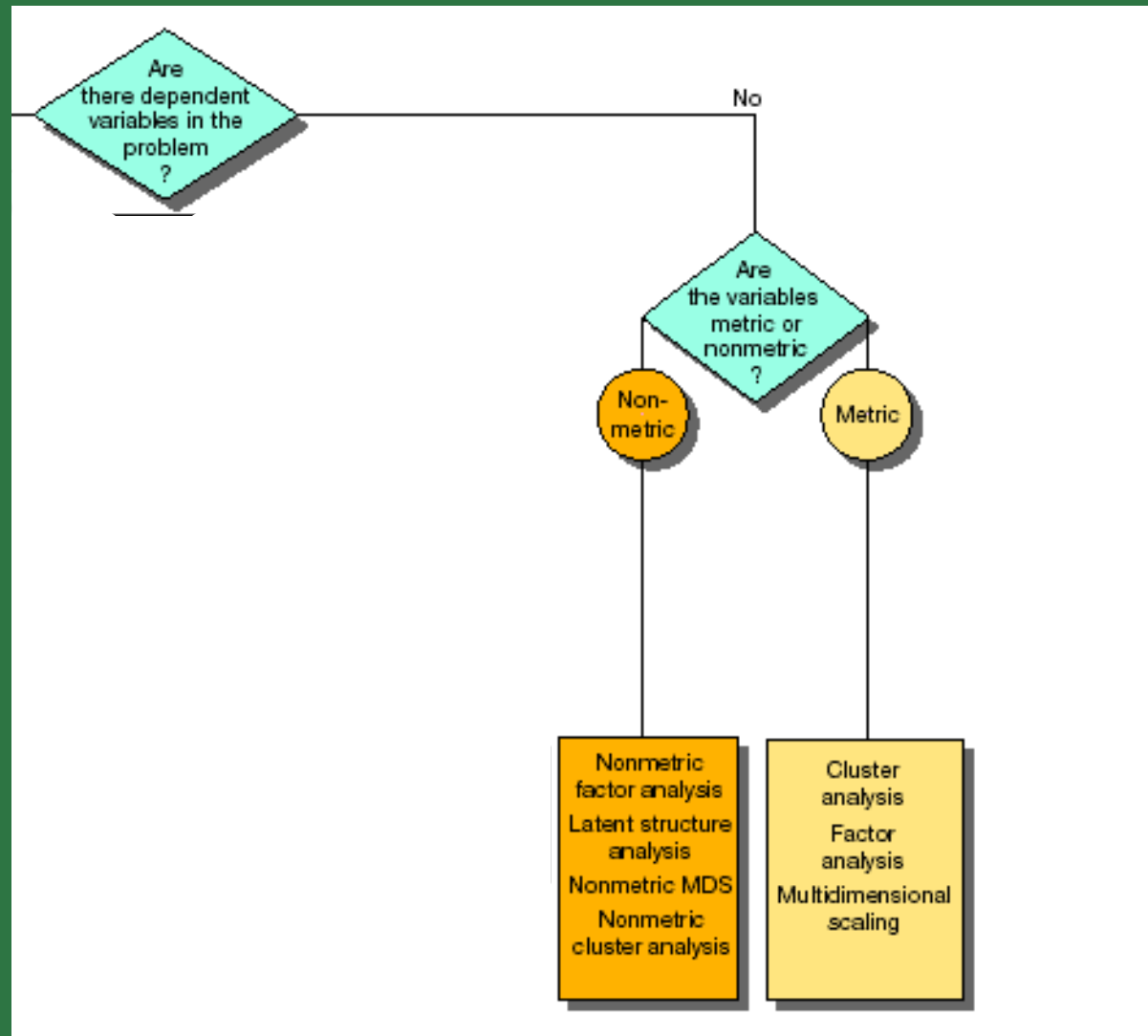
Multivariate Techniques



Multivariate Techniques



Multivariate Techniques



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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.

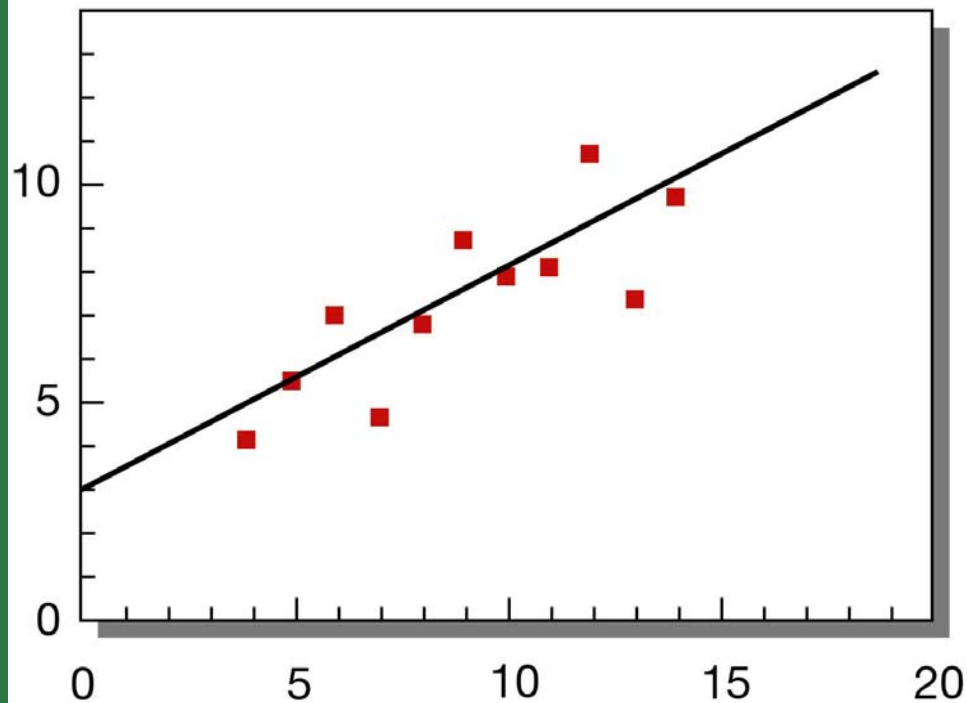
Coefficients

		Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	Sig.	Collinearity Statistics
Model		<i>B</i>	Std. Error	<i>Beta</i>			<i>VIF</i>
1	(Constant)	.579	.151		3.834	.000	
	Cost/speed	.857	.035	.879	24.753	.000	1.000
2	(Constant)	9.501E-02	.130		.733	.464	
	Cost/speed	.537	.042	.551	12.842	.000	2.289
	Security	.428	.042	.437	10.182	.000	2.289
3	(Constant)	-9.326E-02	.127		-.734	.464	
	Cost/speed	.448	.043	.460	10.428	.000	2.748
	Security	.315	.045	.321	6.948	.000	3.025
	Reliability	.254	.050	.236	5.059	.000	3.067

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

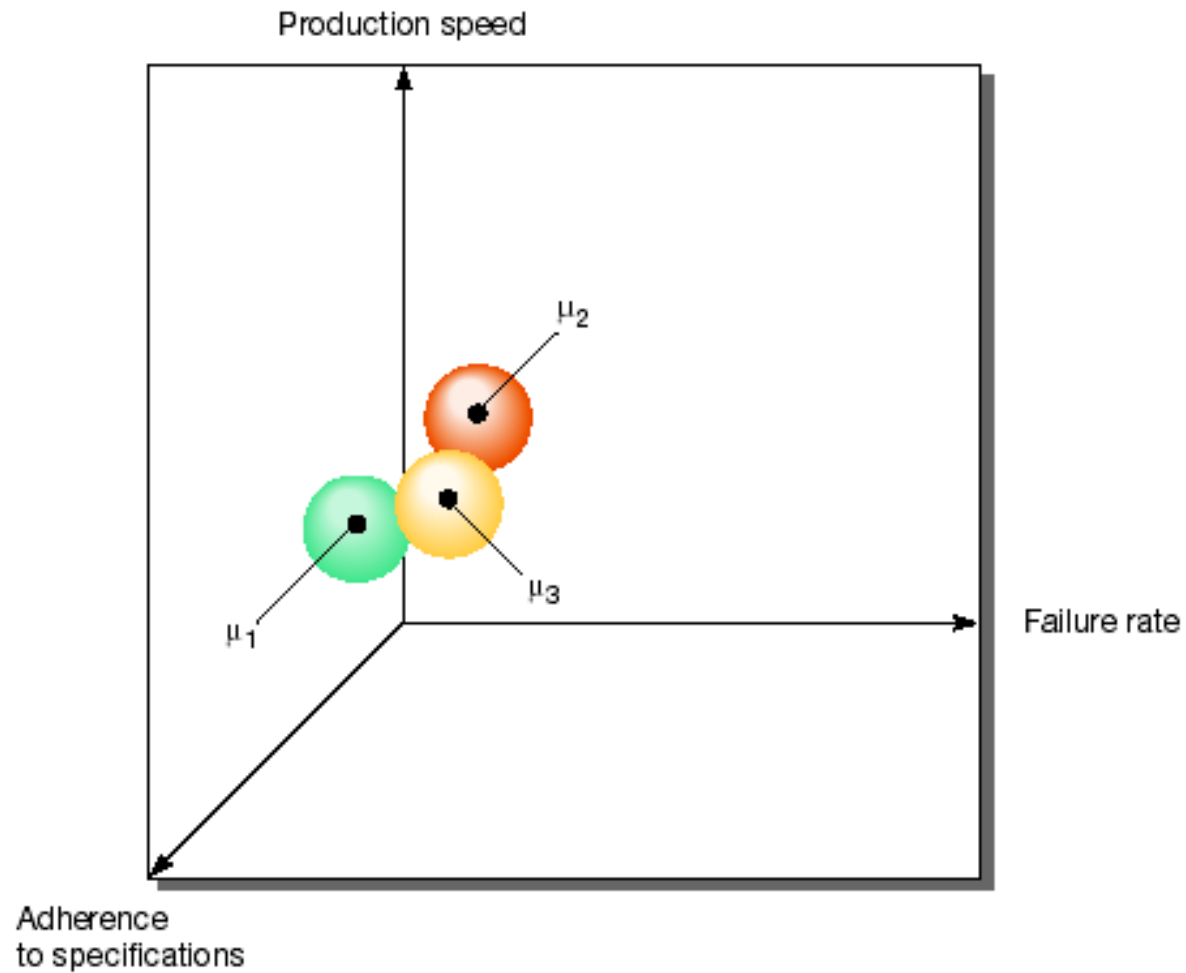
A.

			Predicted Success	
Actual Group		Number of Cases	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 =	7354.80161 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	<i>F</i>	Sig. of <i>F</i>
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

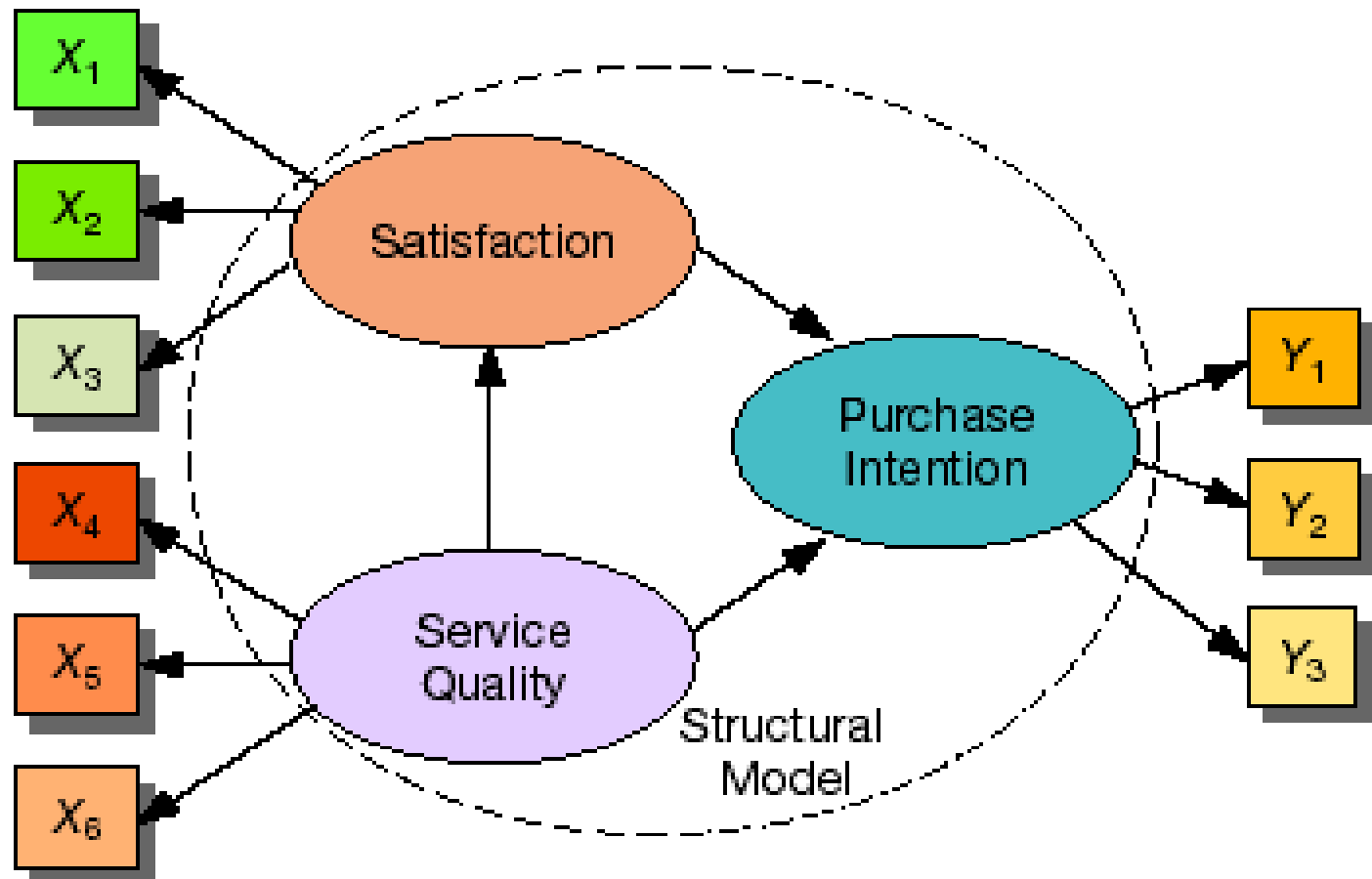
Respecification of the Model

Interpretation and Communication

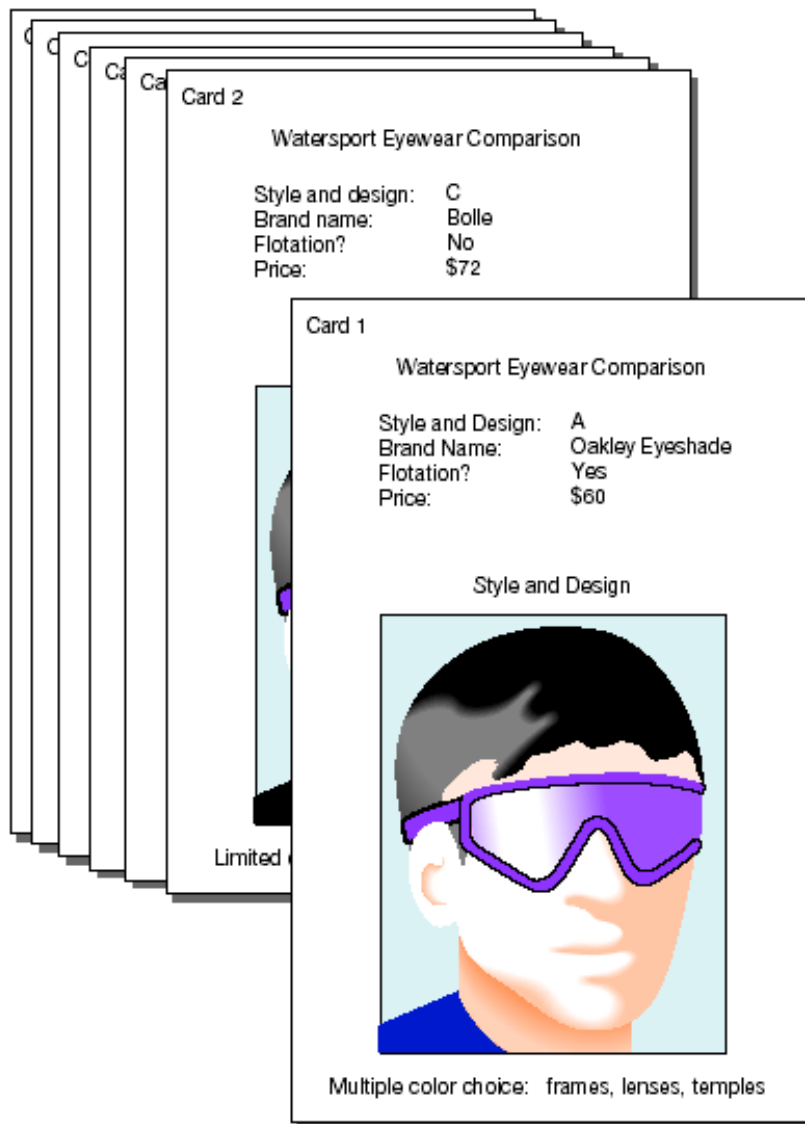
Structural Equation Modeling (SEM)

Measurement Model
(independent variables)

Measurement Model
(outcome variables)



Concept Cards for Conjoint Sunglasses Study



Conjoint Analysis

Brand	Bolle	Hobbies	Oakley	Ski Optiks
Style*	A	A	A	A
	B	B		
	C	C		
Flotation	Yes No	Yes	Yes	Yes
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



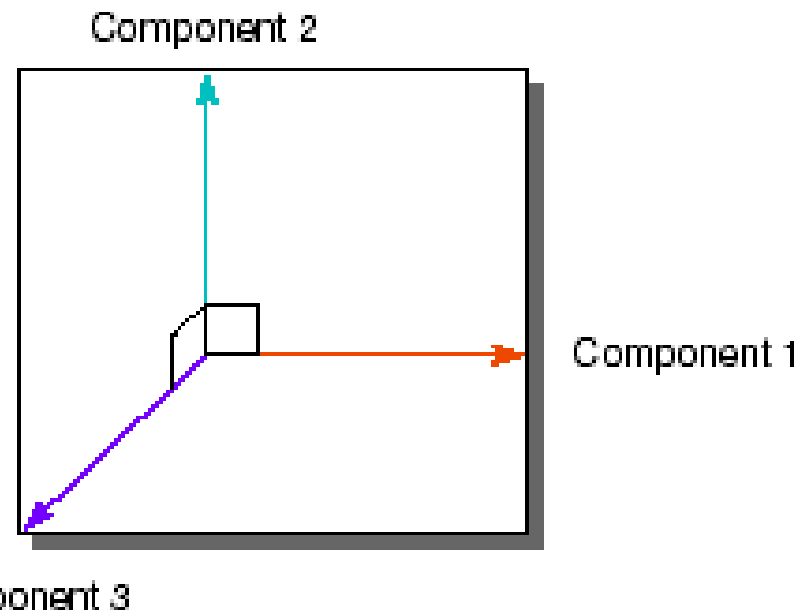
Interdependency Techniques

Factor Analysis

Cluster Analysis

Multidimensional Scaling

Factor Analysis

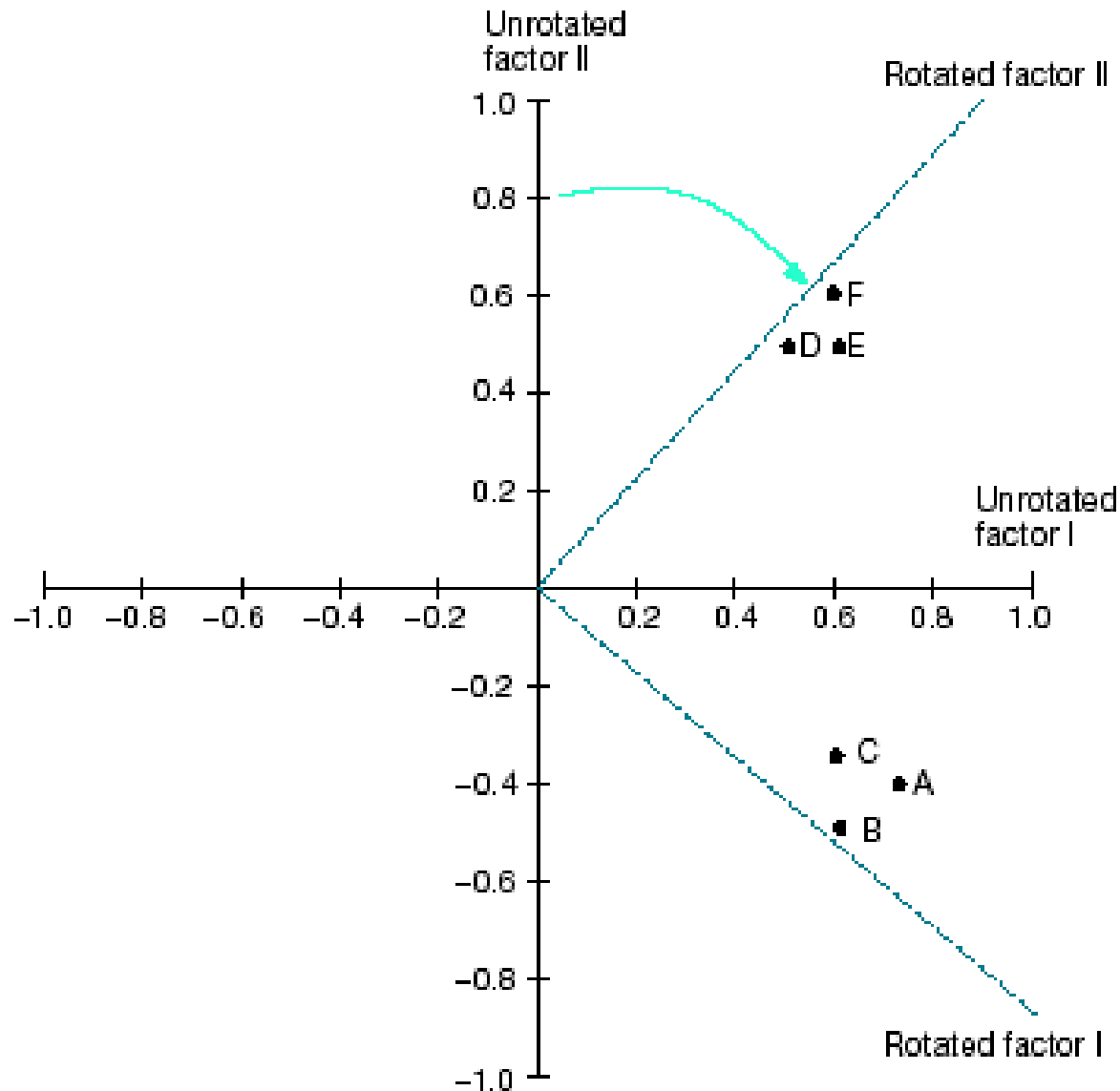


Extracted Components	% of Variance Accounted For	Cumulative Variance
Component no. 1	63%	63%
Component no. 2	29	92
Component no. 3	8	100

Factor Matrices

	A <u>Unrotated Factors</u>			B <u>Rotated Factors</u>	
Variable	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	0.01	0.53	-.16	0.31
V3	Accounting	0.89	-.17	0.37	0.95
V4	Finance	-.60	0.21	0.30	0.49
V5	Marketing	0.02	-.24	-.22	0.11
V6	Human Behavior	-.43	-.09	-.36	0.32
V7	Organization Design	-.11	-.58	-.03	0.35
V8	Production	0.25	0.25	-.31	0.22
V9	Probability	-.43	0.43	0.50	0.62
V10	Statistical Inference	0.25	0.04	0.35	0.19
Eigenvalue	Quantitative Analysis	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

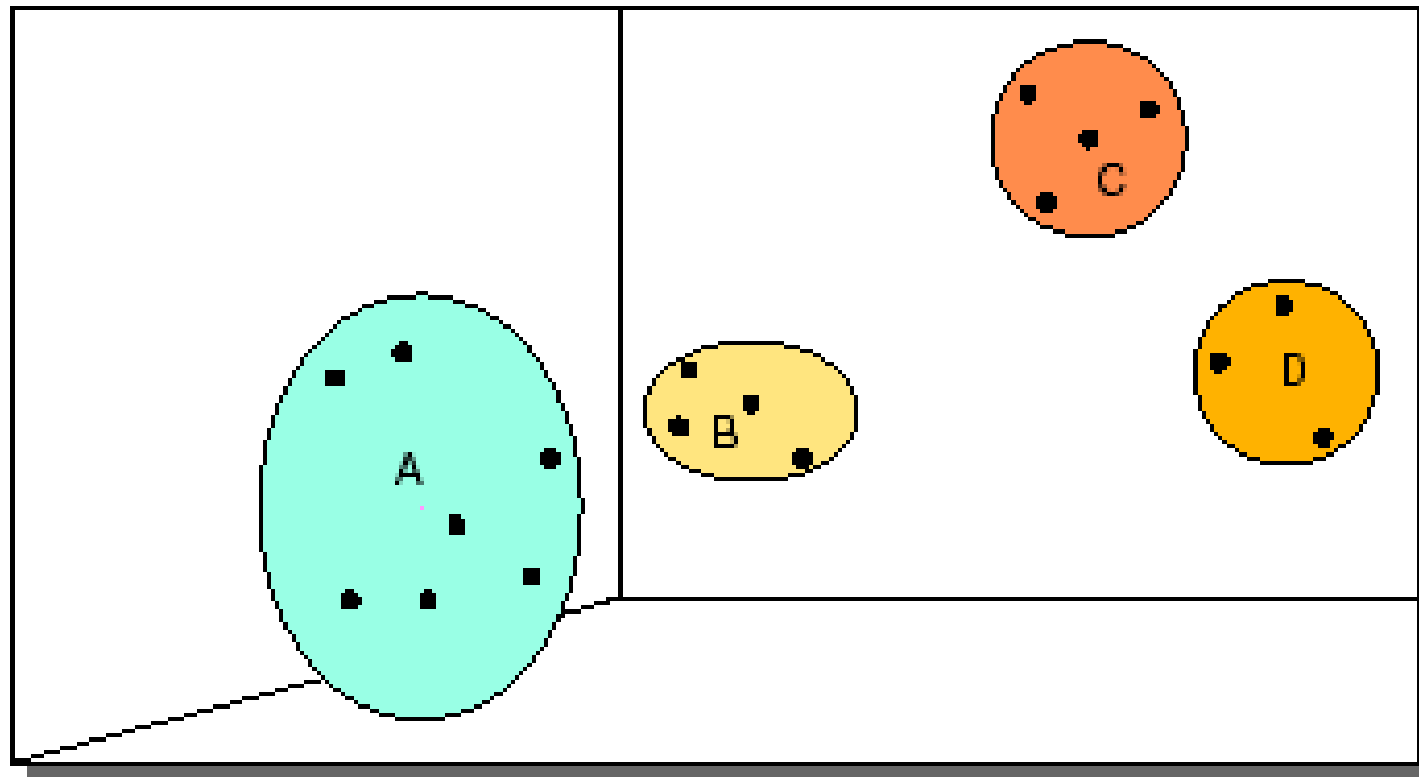
Compute similarities

Select mutually exclusive clusters

Compare and validate cluster

Cluster Analysis

Income



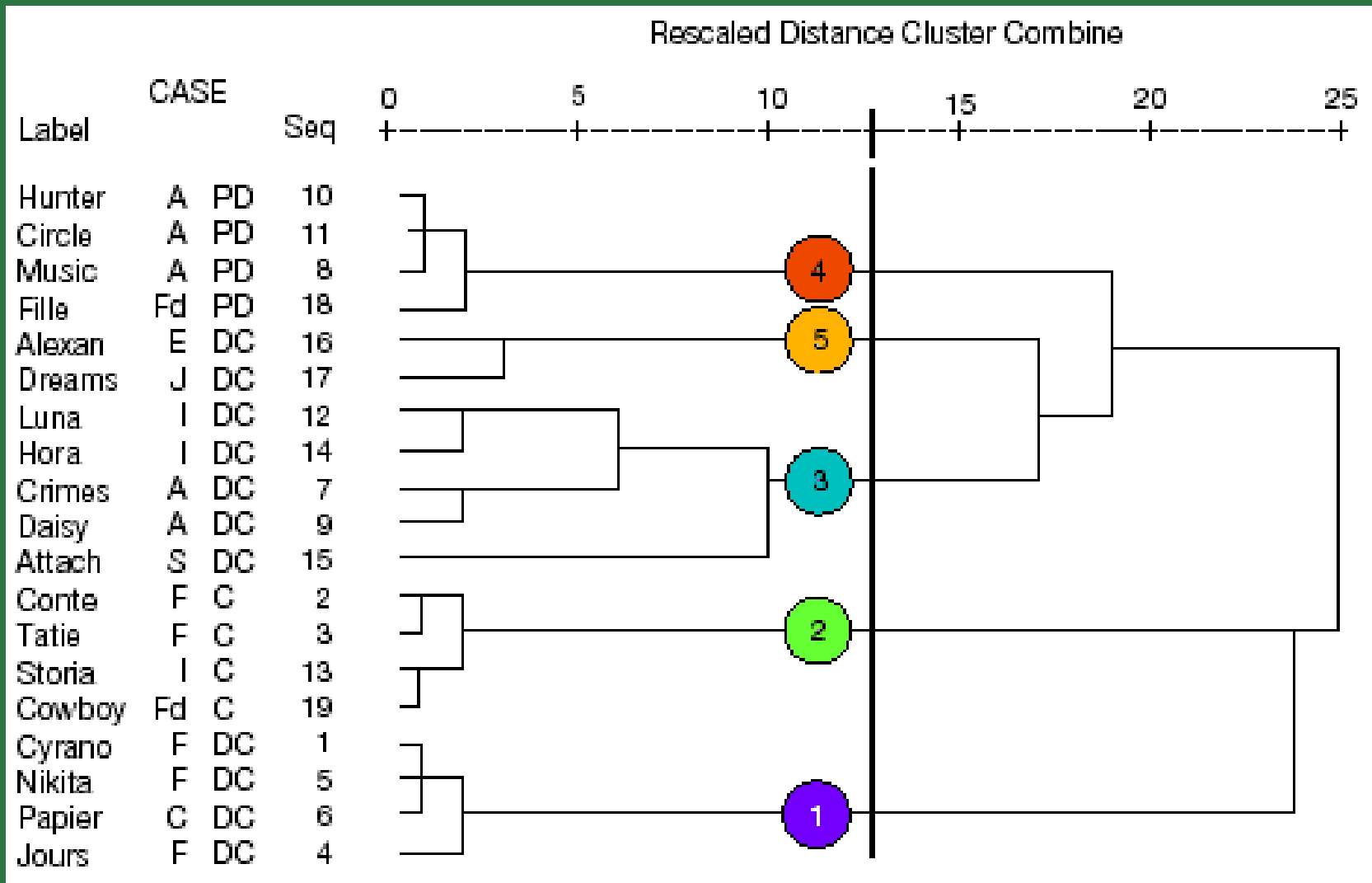
Age

Family size

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

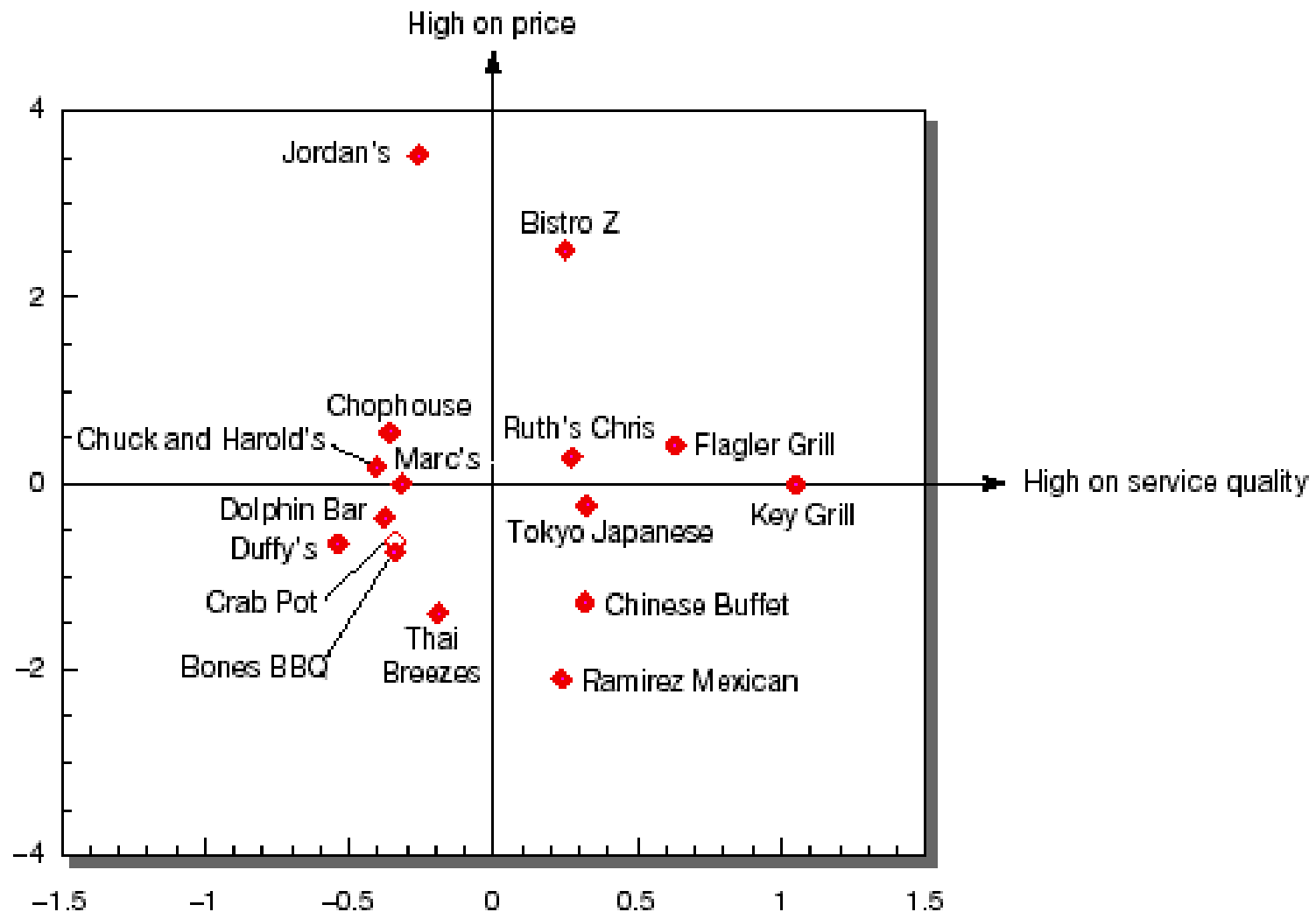
Dendrogram




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	8.7	5.8	0								
9	4.3	6.9	1.1	5.3	18.3	1.2	3.8	8.9	0							
10	8.2	4.9	8.5	4.1	15.3	8.6	7.6	3.9	9.3	0						
11	8.6	8.7	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	8.4	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

- | | |
|---|--|
| <ul style="list-style-type: none">• Average linkage method• Backward elimination• Beta weights• Centroid• Cluster analysis• Collinearity• Communality | <ul style="list-style-type: none">• Confirmatory factor analysis• Conjoint analysis• Dependency techniques• Discriminant analysis• Dummy variable• Eigenvalue• Factor analysis |
|---|--|



Key Terms (cont.)

- | | |
|--|--|
| <ul style="list-style-type: none">• Factors• Forward selection• Holdout sample• Interdependency techniques• Loadings• Metric measures• Multicollinearity | <ul style="list-style-type: none">• Multidimensional scaling (MDS)• Multiple regression• Multivariate analysis• Multivariate analysis of variance (MANOVA)• Nonmetric measures• Path analysis |
|--|--|

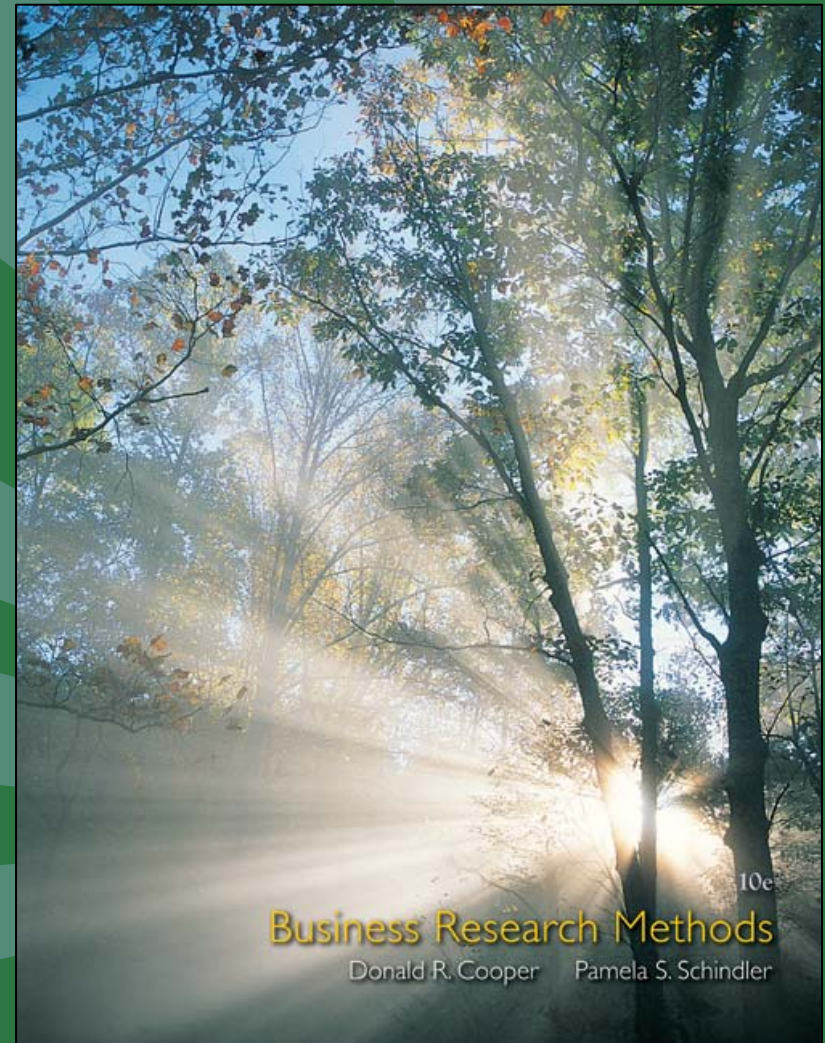



Key Terms (cont.)

- | | |
|---|--|
| <ul style="list-style-type: none">• Path diagram• Principal components analysis• Rotation• Specification error• Standardized coefficients | <ul style="list-style-type: none">• 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.

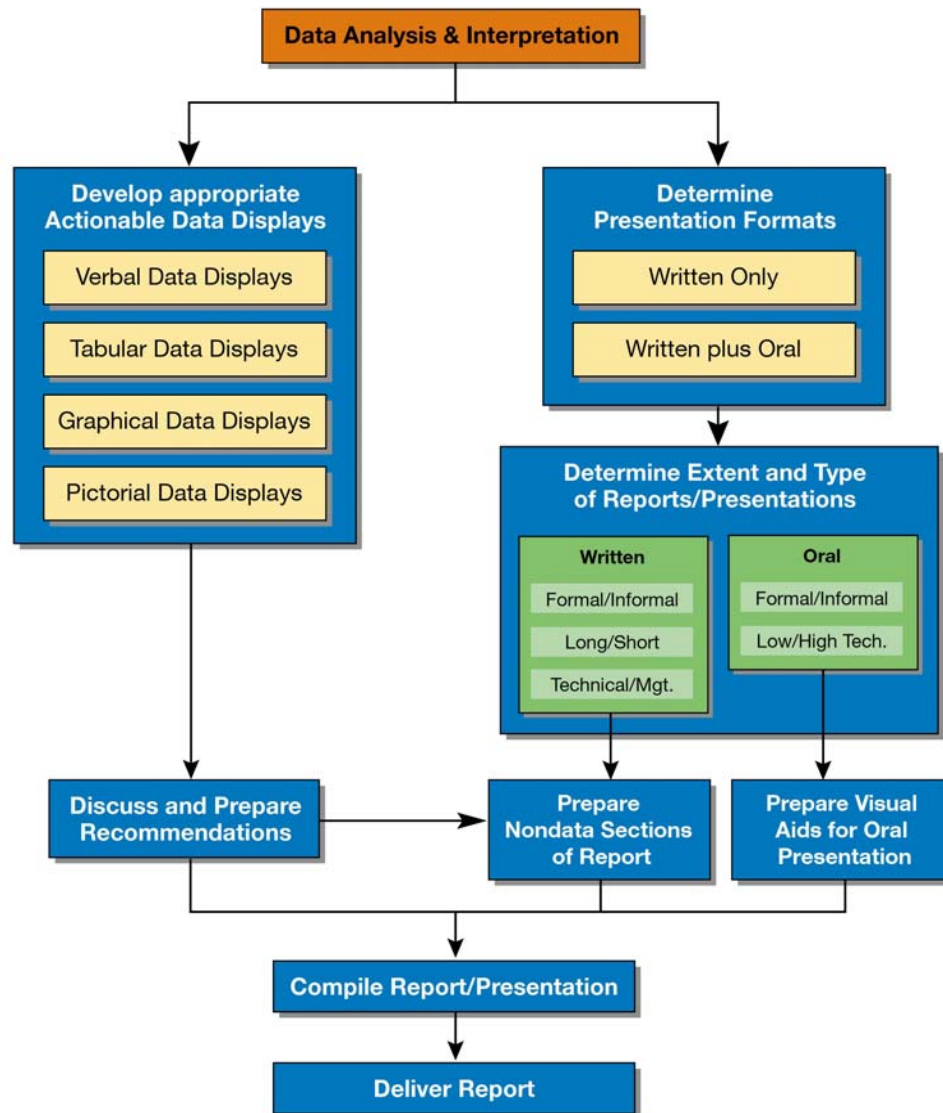


Relevance. Not Quantity.

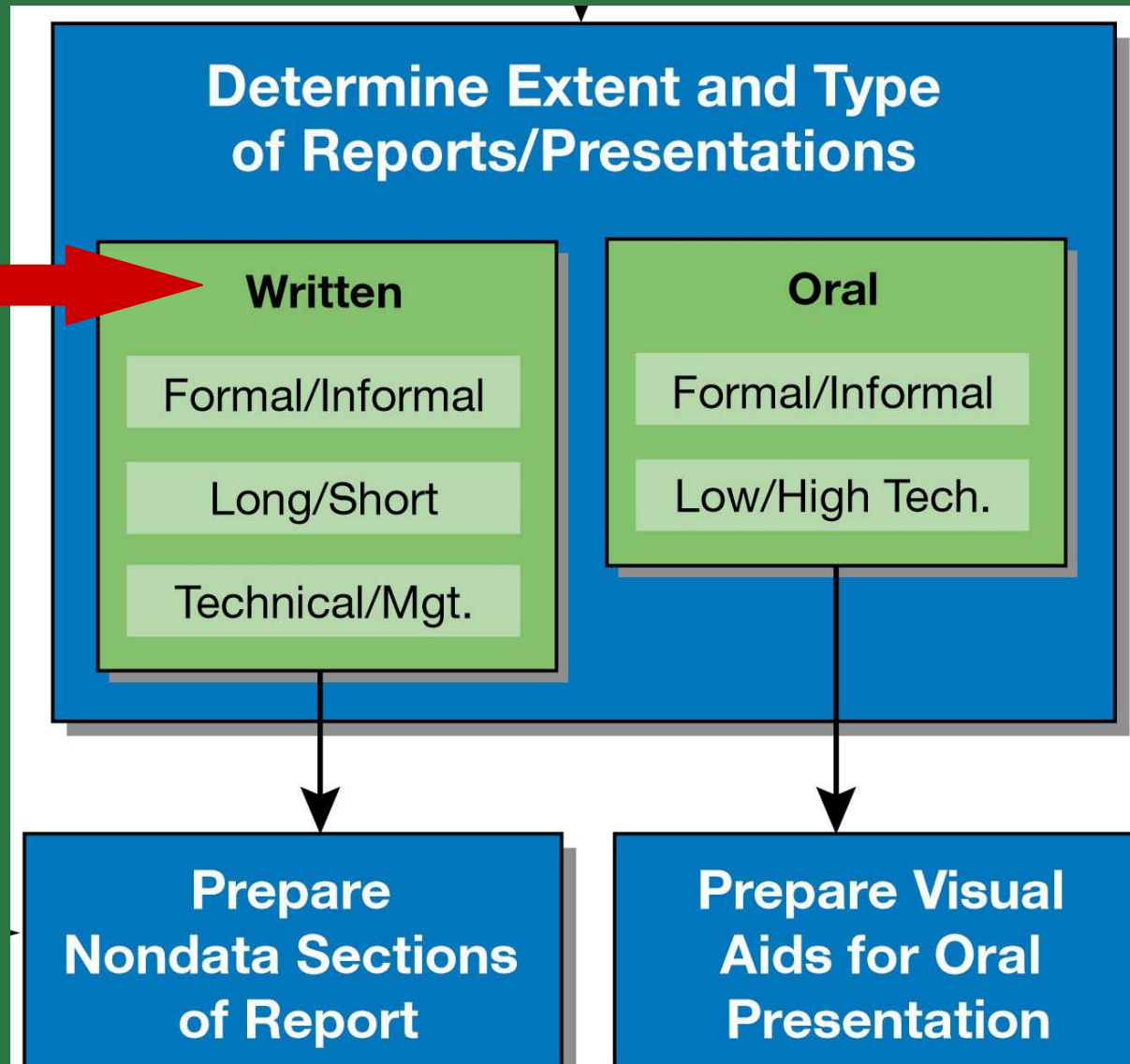
“Focus on relevance. It’s never about the volume of analyzed data or the complexity of an algorithm but about the actionability of derived insight.”


*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

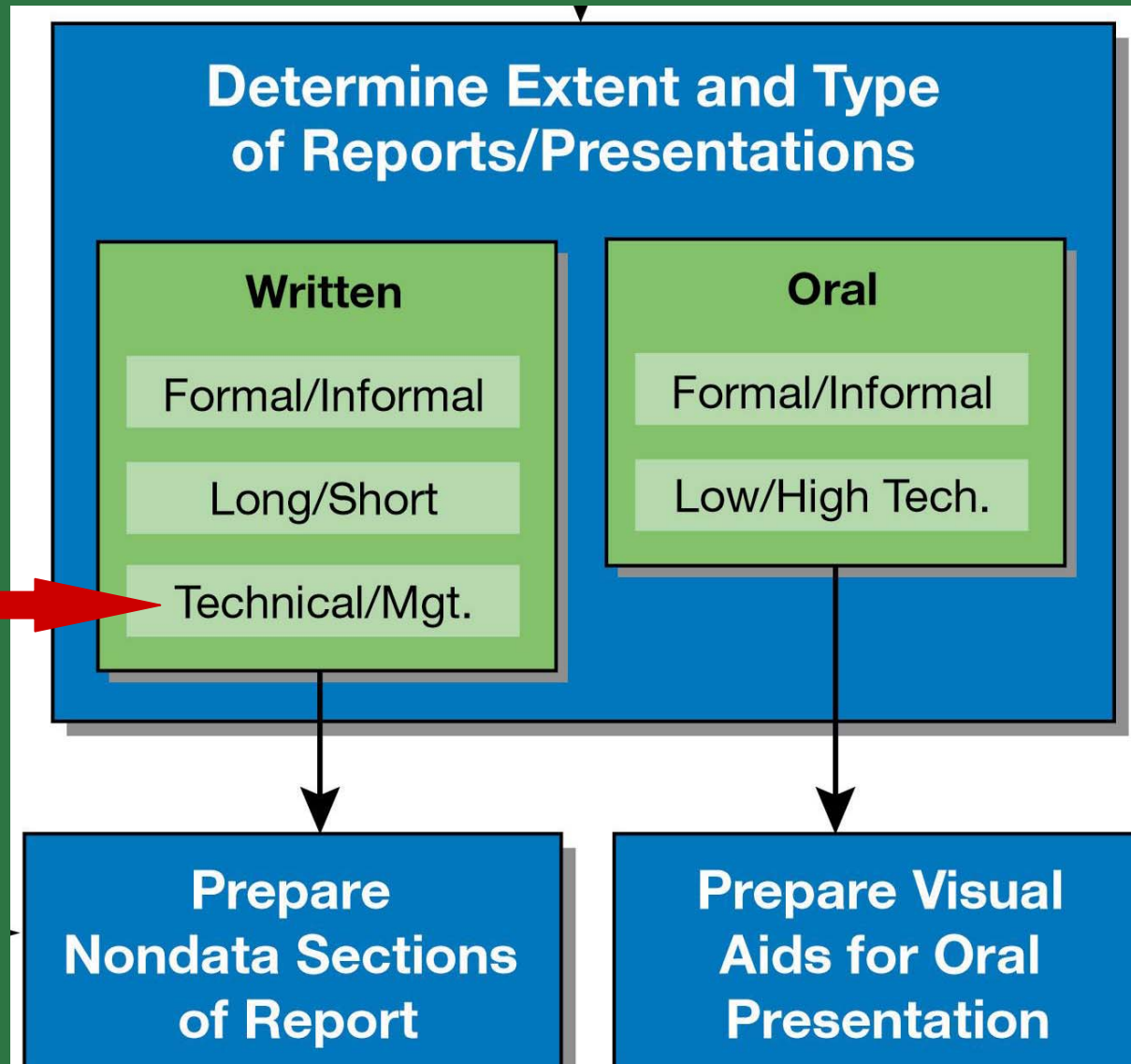
Remind reader of request

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



A vertical photograph of a forest scene with tall trees and sunlight filtering through the canopy.

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

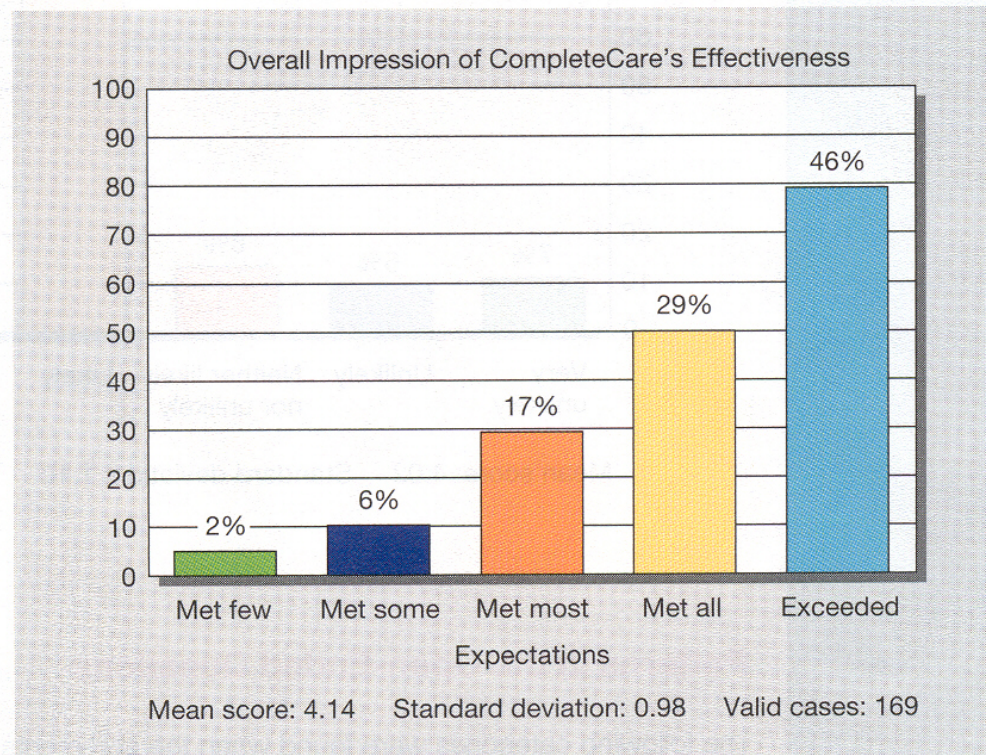
- Findings:**
1. In this city, *commercial banks are not the preferred savings medium*. Banks are in a *weak third place* behind money market accounts.
 2. Customers of the Central City Bank have a *somewhat more favorable attitude toward bank savings* and less of a preference for government bonds.
- 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%
	$n = 216$	$n = 105$	$n = 111$

Sample Findings Page: Graphical

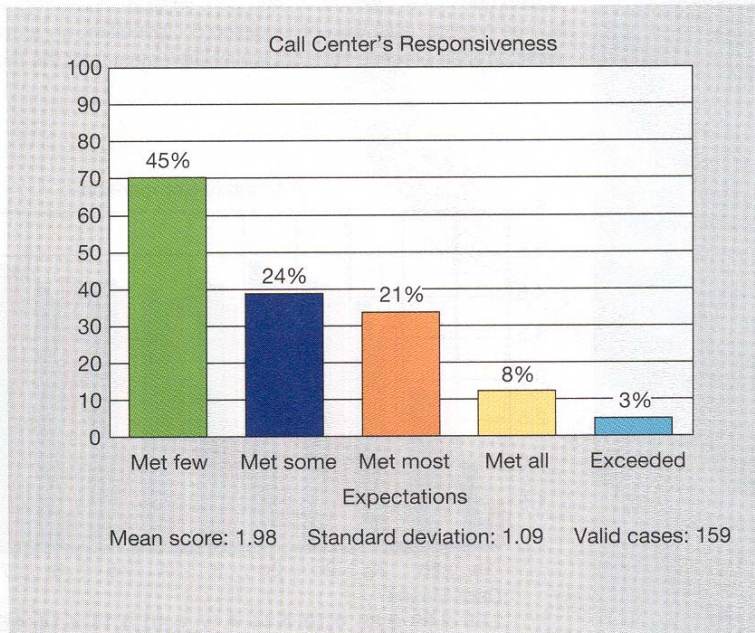
Question 6. Overall Impression of CompleteCare's Effectiveness.

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).

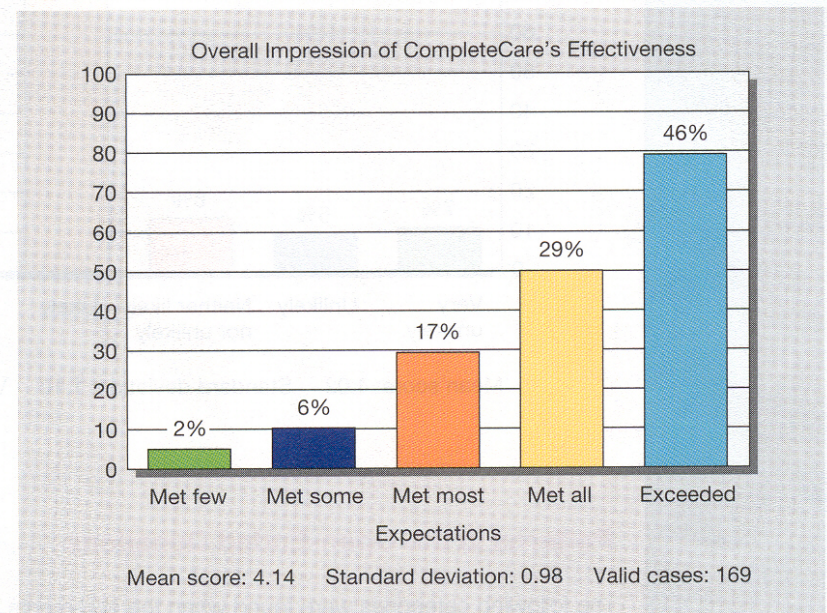



Findings Page Templates

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

A background image showing a person's hand writing on a notepad with a pen. The notepad has a red cover and a white page. The person is wearing a red shirt. The background is slightly blurred.

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.

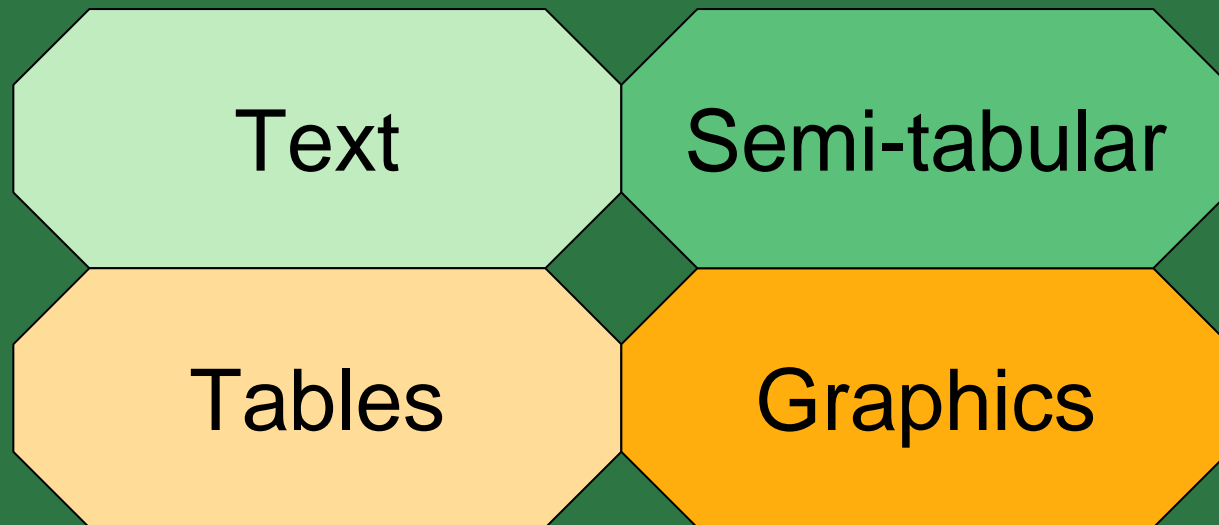
Use shorter paragraphs


Indent or space parts of text

Use headings

Use bullets

Presentation of Statistics





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%



Internet Access and Usage, Percent of Adults 18+ ←

	Total Adults	Any Online/ Internet Usage*	Have Internet Access			Used the Internet in the last 30 days	Column Headers
			Home/ Work/ Other	Home	Work		
	216,971	143,262	175,569	140,062	79,121	141,284	Body
Percent Distribution							
Men	48.2	48.0	48.3	49.1	49.4	48	
Women	51.8	52.0	51.7	50.9	50.6	52.0	
Education							
Graduated College Plus	25.2	35.1	29.9	34.4	46.3	35.4	
Attended College	27.2	33.1	30.5	31.8	31.3	33.3	
Did not Attend College	47.6	31.8	39.6	33.8	22.4	31.3	
Age							
Age 18-34	31.1	36.4	33.6	31.8	33.3	36.6	
Age 35-54	39.3	44.0	42.2	44.7	52.3	44.0	
Age 55+	29.6	19.7	24.2	23.5	14.4	19.4	
Employment							
Employed Full-time	52.9	62.7	58.4	60.6	87.1	63.0	
Employed Part-time	11.5	12.9	12.4	12.7	12.4	12.9	
Occupation							
Professional	13.3	19.0	16.1	18.4	31.1	19.3	
Mgmt./Bus/Finan./Ops.	9.5	13.1	11.4	12.8	20.8	13.2	
Sales/Office Occs.	16.1	20.9	18.7	19.0	29.3	21.0	
Nat. Res./Constr./Maint.	6.9	6.0	6.4	6.4	5.4	5.9	
Other Employed	18.6	16.7	18.1	16.7	13.9	16.5	
Household Income							
\$150,000 or more	7.9	10.9	9.6	11.5	15.1	11.0	
\$75,000–149,999	24.7	33.0	29.2	33.8	40.6	33.2	
\$50,000–74,999	19.9	22.8	22.2	23.5	23.0	22.8	
Less than \$50,000	47.5	33.3	39.1	31.1	21.3	33.0	
Marital Status							
Never Married	24.8	26.5	25.4	22.8	22.9	26.5	
Now Married	56.4	60.1	59.1	64.1	64.8	60.2	
Other	18.7	13.4	15.5	13.1	12.4	13.3	
Household Size							
1–2 Persons	46.6	41.9	43.2	41.0	41.1	41.8	
3–4 Persons	37.9	42.3	40.8	43.2	44.5	42.5	
5+ Persons	15.5	15.8	16	15.9	14.4	15.7	
Any Child in Household	41.1	45.6	44.2	45.0	48.1	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.siaa.net/software/pubs/usage_06.pdf). Copyright 2006, Mediamark Research Inc.

Title

Column Headers

Body

Footnote

Source Note

Banner

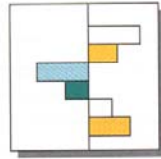
Sample Tabular Findings

20-29

Graphics Presentation



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



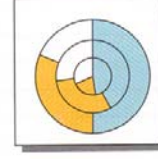
Bar Same as the column but positions categories on Y axis and values on X axis. Deviations, when used, distinguish positive from negative values.



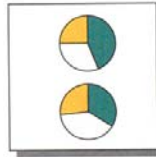
Stacked Bar In either bar or column, shows how components contribute to the total of the category.



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.



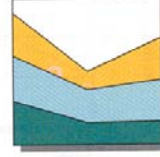
Multiple Pie Uses same data as stacked pie but plots separate pies for each column of data without stacking.



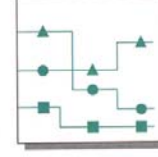
Line Compares values over time to show changes in trends.



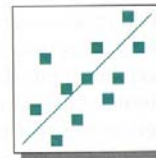
Filled Line Similar to line chart, but uses fill to highlight series.



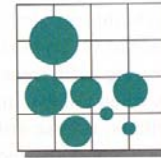
Area (surface) Like line chart, compares changing values but emphasizes relative value of each series.



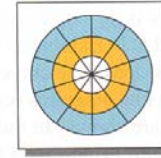
Step Compares discrete points on the value axis with vertical lines showing difference between points. Not for showing a trend.



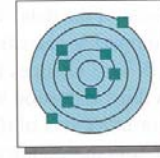
Scatter Shows if relationship between variables follows a pattern. May be used with one variable at different times.



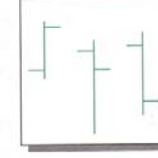
Bubble Used to introduce third variable (dots of different sizes). Axes could be sales, profits; bubbles are assets.



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.

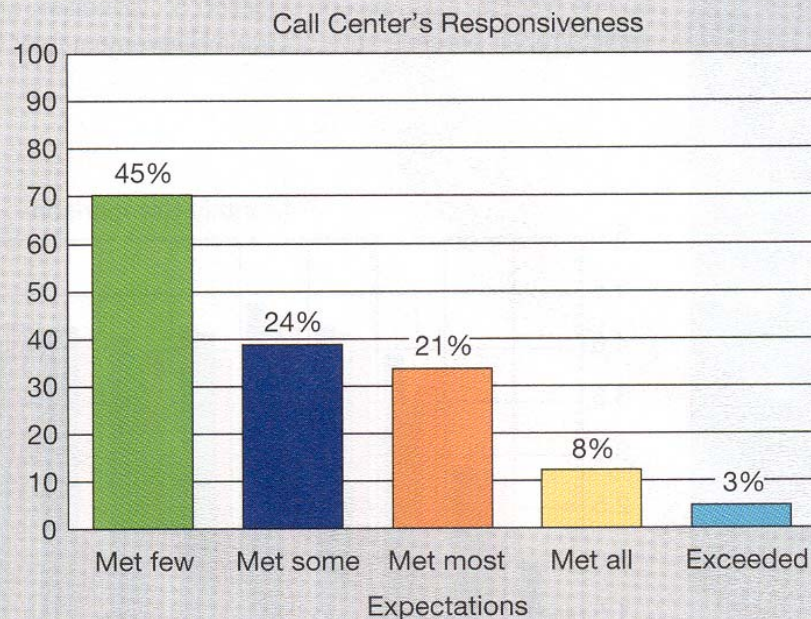
Boxplot Displays distribution(s) and compares characteristics of shape (Chapter 19).



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

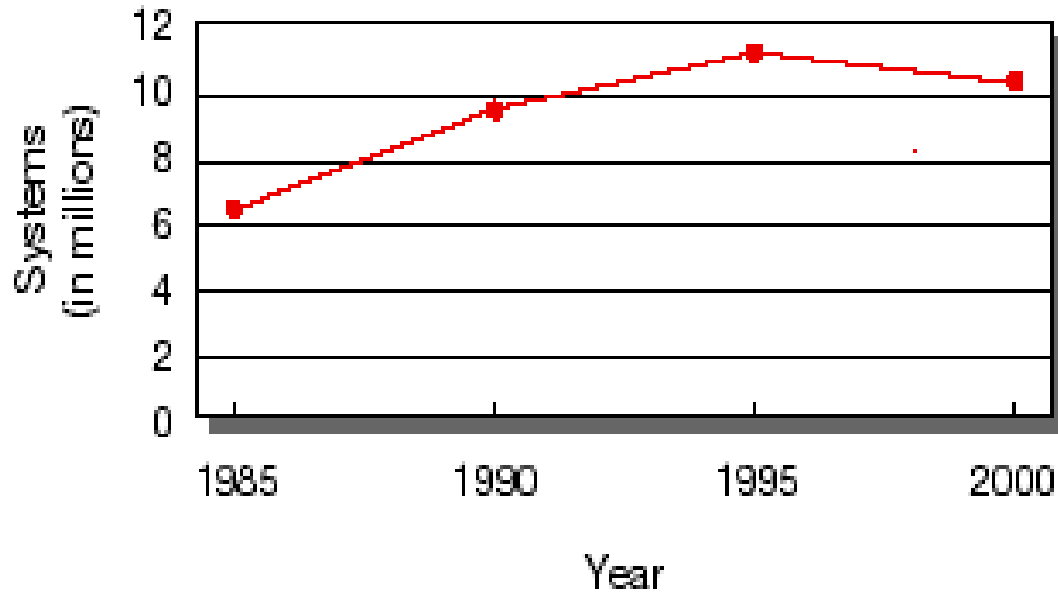
Sample Graphics within Report

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.

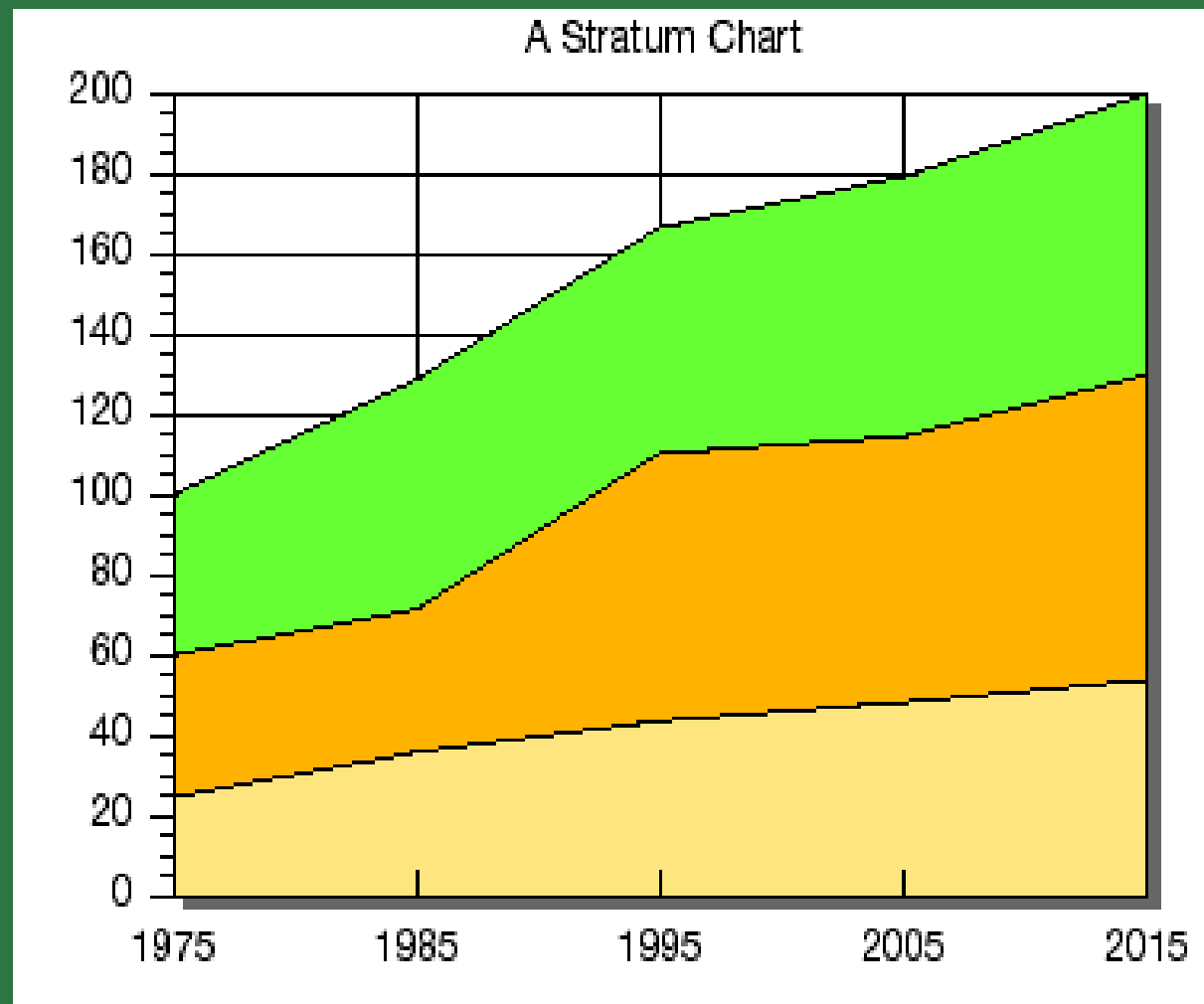


Mean score: 1.98 Standard deviation: 1.09 Valid cases: 159

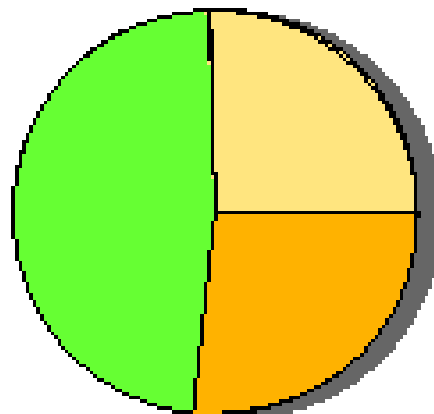
Sample Line Graph



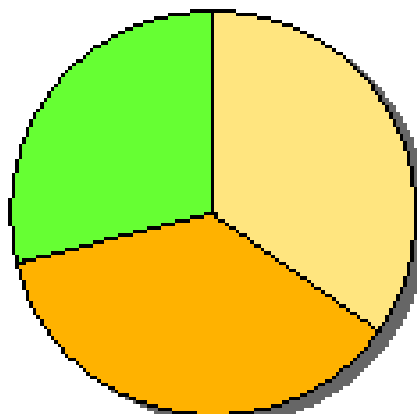
Sample Area Chart



Sample Pie Charts

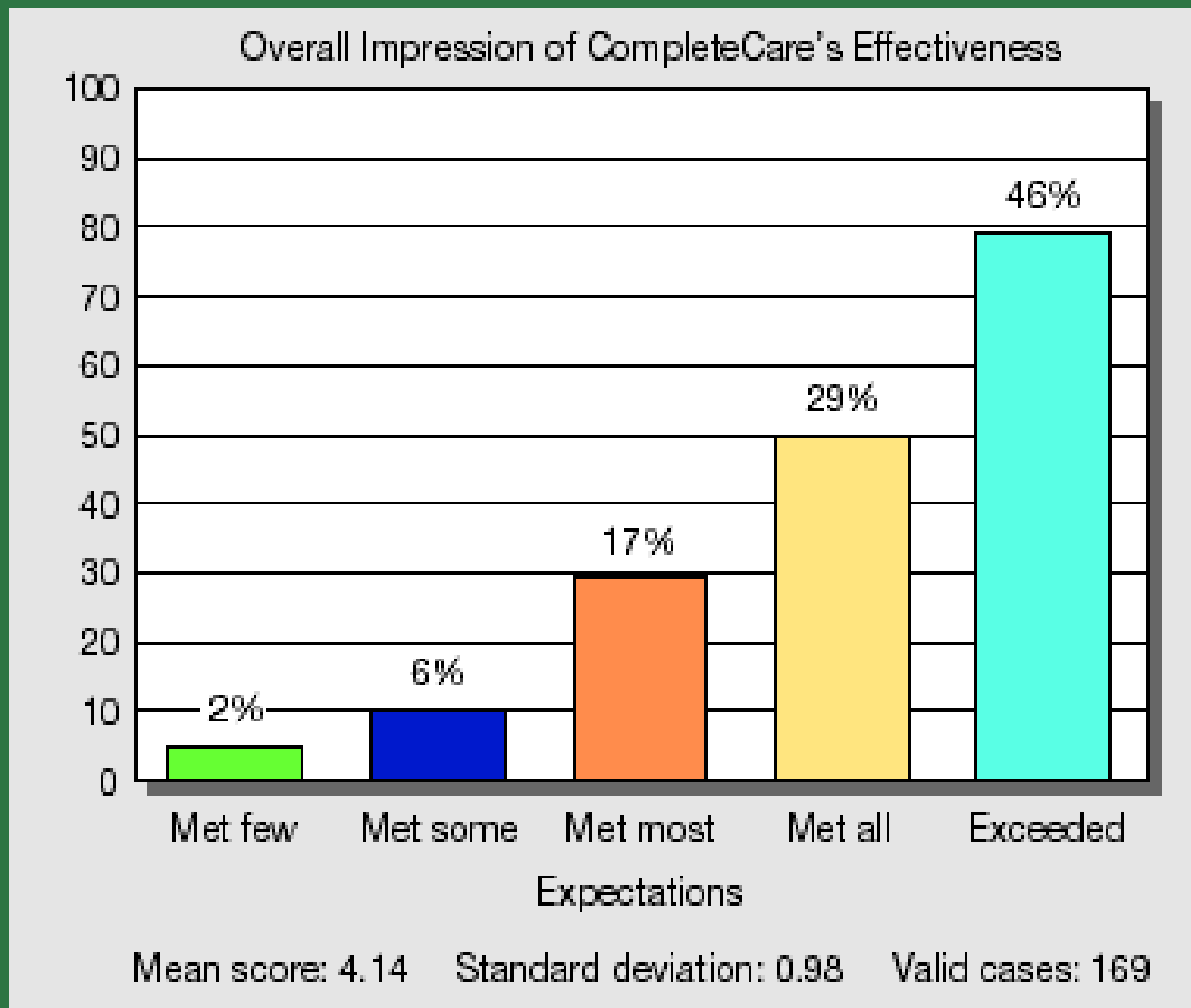


1975



2005

Sample Bar Chart



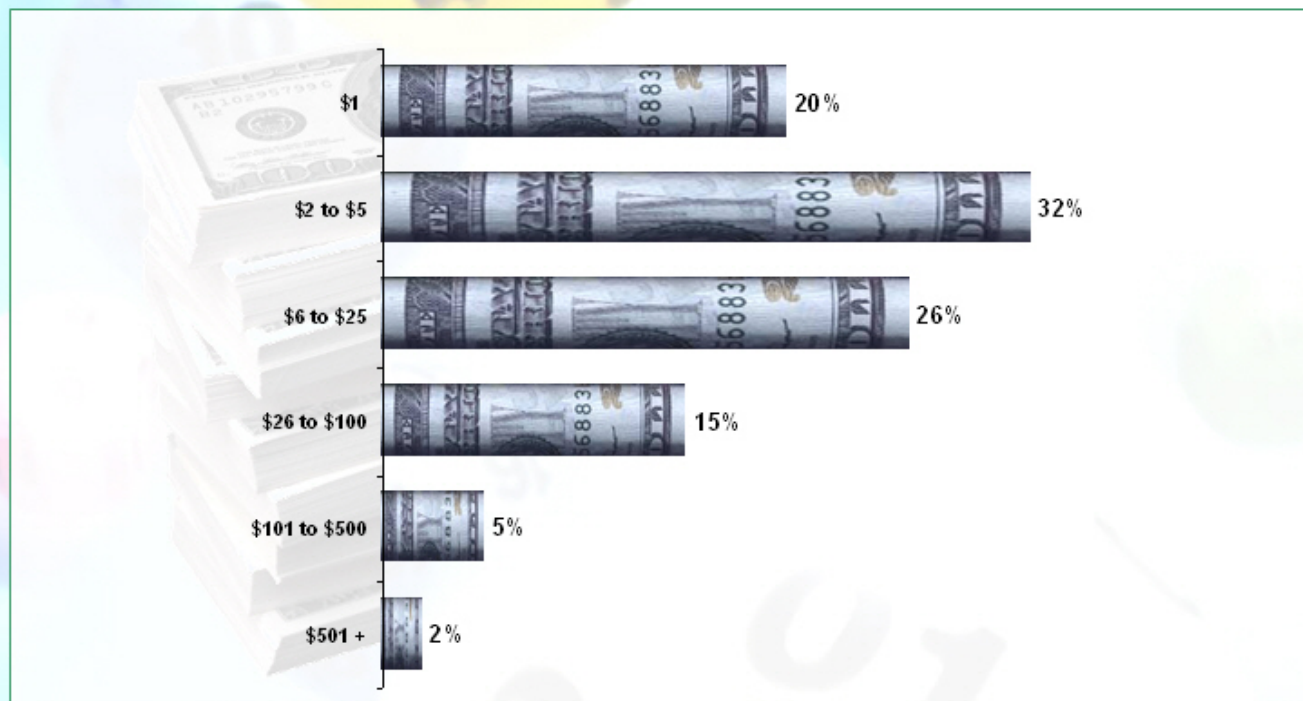
Pictograph



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.

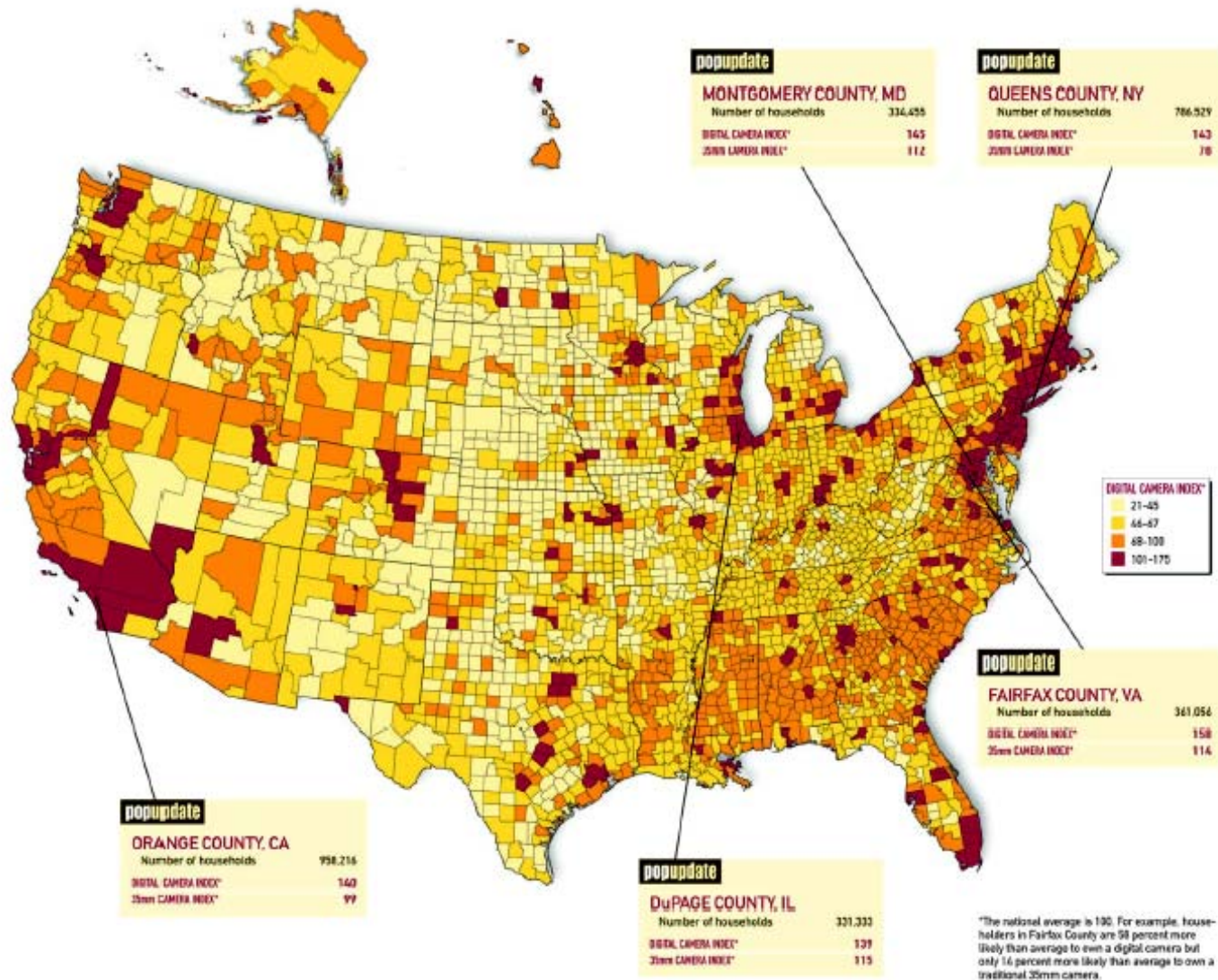


Base: Players Who Consider Winning Less Than The Jackpot A Win (1,048)

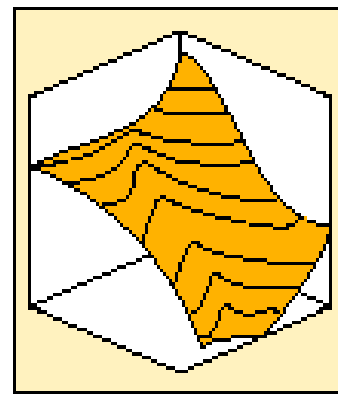
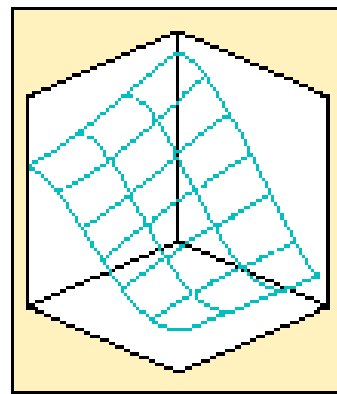
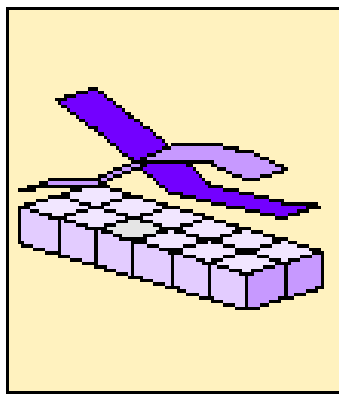
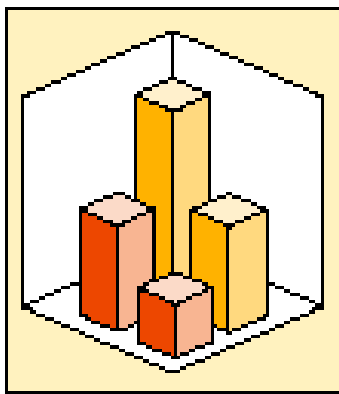
MRSI

Ohio Lottery Segmentation Study (October 2005)

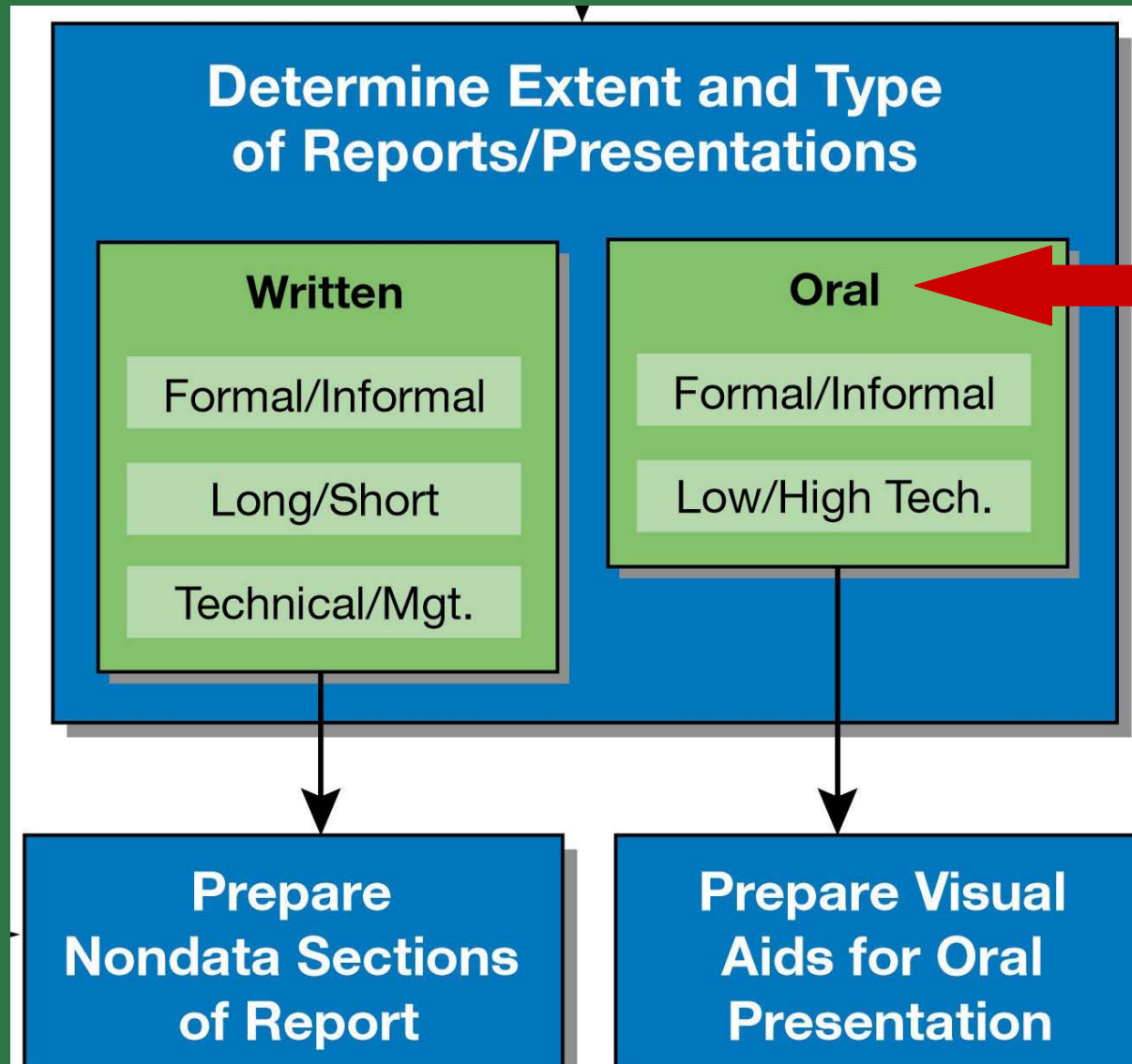
Geographs



3-D Graphs



The Oral Report



The Oral Report

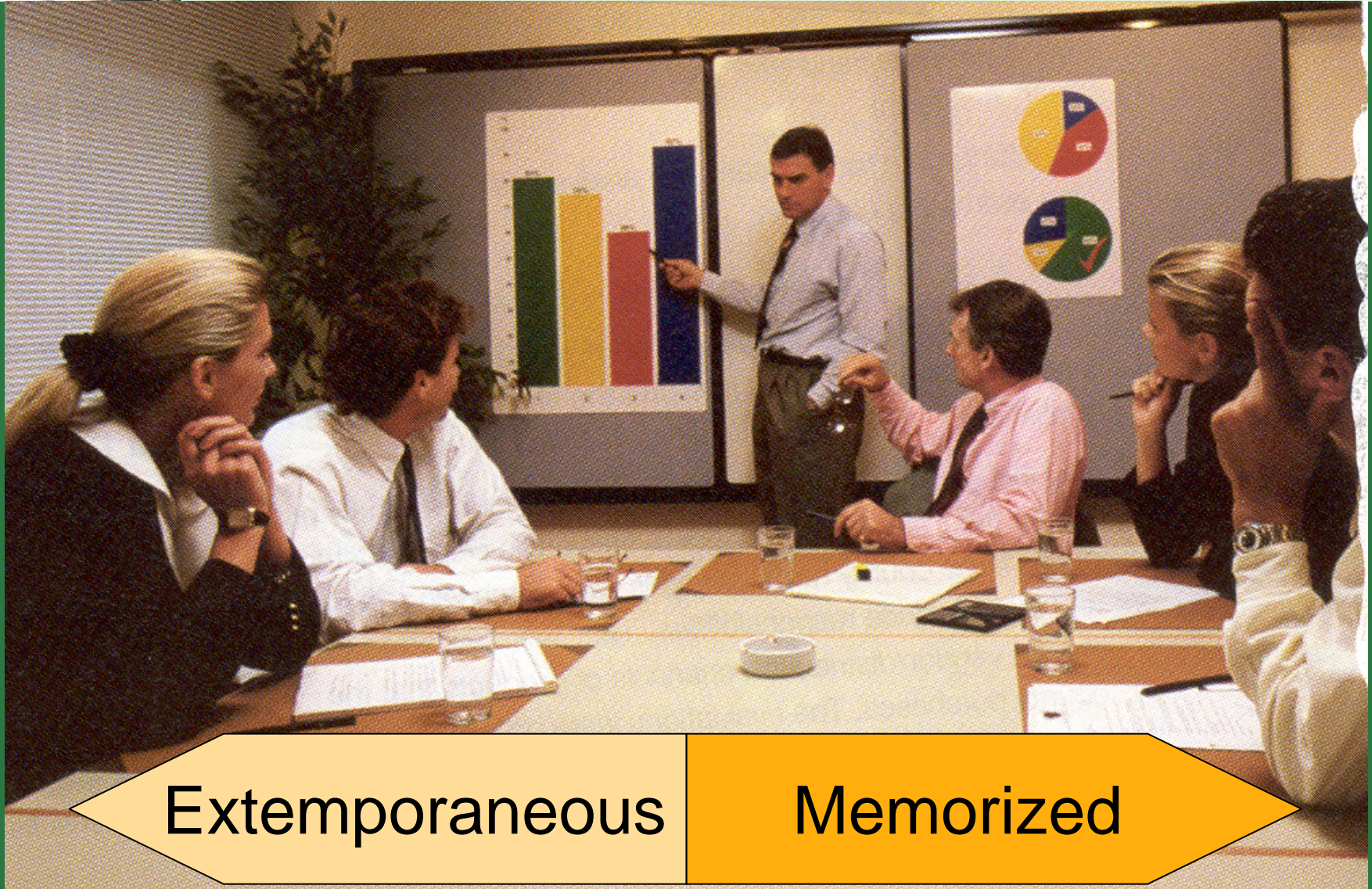



Opening

Findings and
conclusions

Recommendations

Presentation Type





Speaker Characteristics

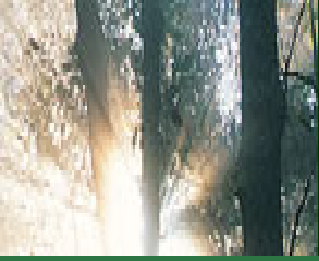
Vocal

- 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



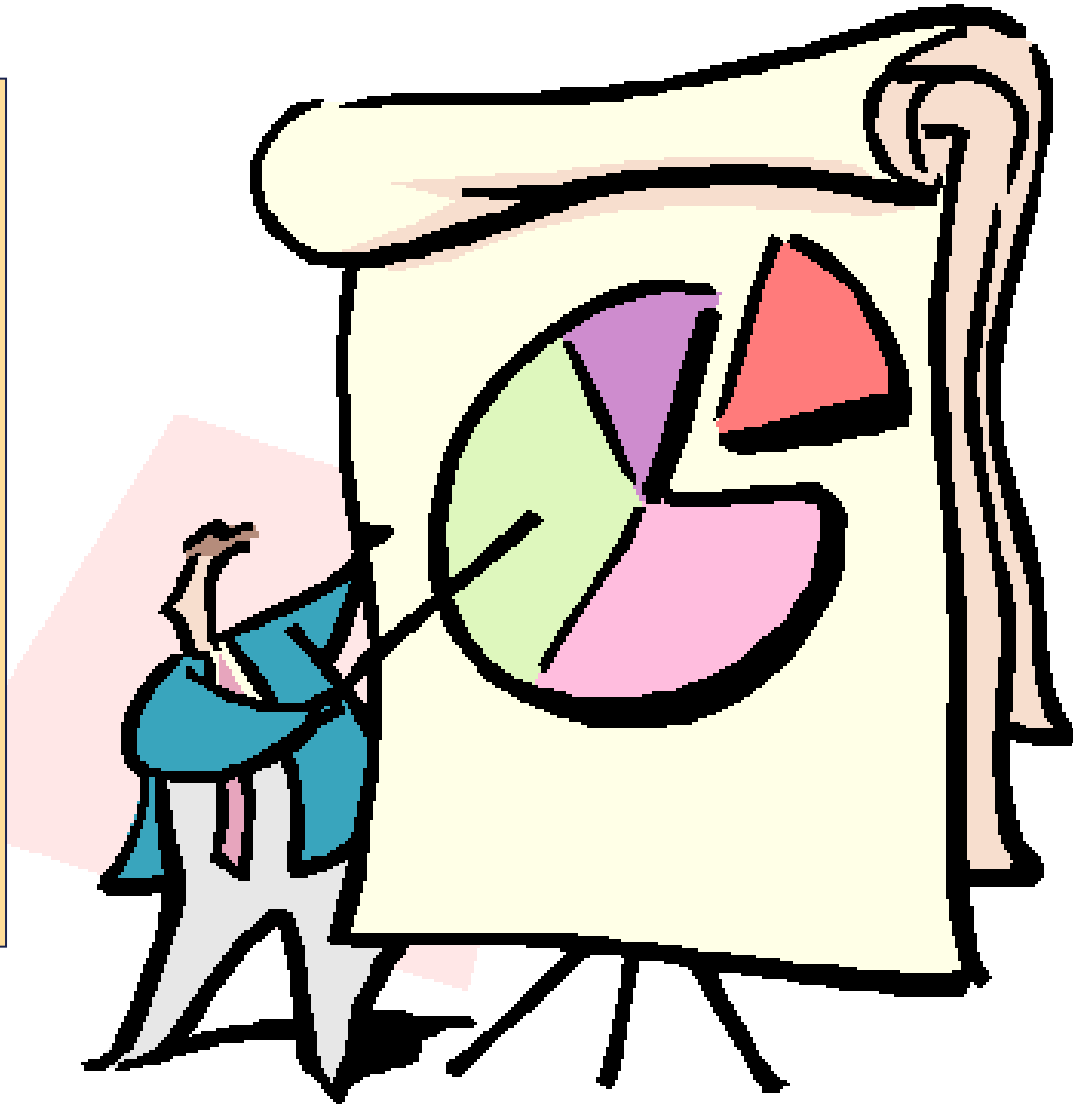
High Tech


- 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

- | | |
|---|---|
| <ul style="list-style-type: none">• Area chart• Bar chart• Briefing• Executive summary• Extemporaneous presentation• Geographic chart• Letter of transmittal• Line graph | <ul style="list-style-type: none">• Management report• Pace• Pictograph• Pie chart• Readability index• Sentence outline• Technical report• 3-D graphic• Topic outline |
|---|---|