

MARK2052 MR3 Quantitative Research

(T3-2019)



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Lecture structure for this lecture

- Course issues and questions
- Last topic: MR2: qualitative research
- Survey
- Experiment
- Lecture summary
- Next topic: MR4: questionnaire design and sampling strategies



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Survey

- Survey: Primary data collected by communicating with a representative sample of people.
 - Respondent: Person responding to survey questions.
 - Quick, inexpensive, efficient, accurate, flexible.
 - Most often associated with quantitative findings.

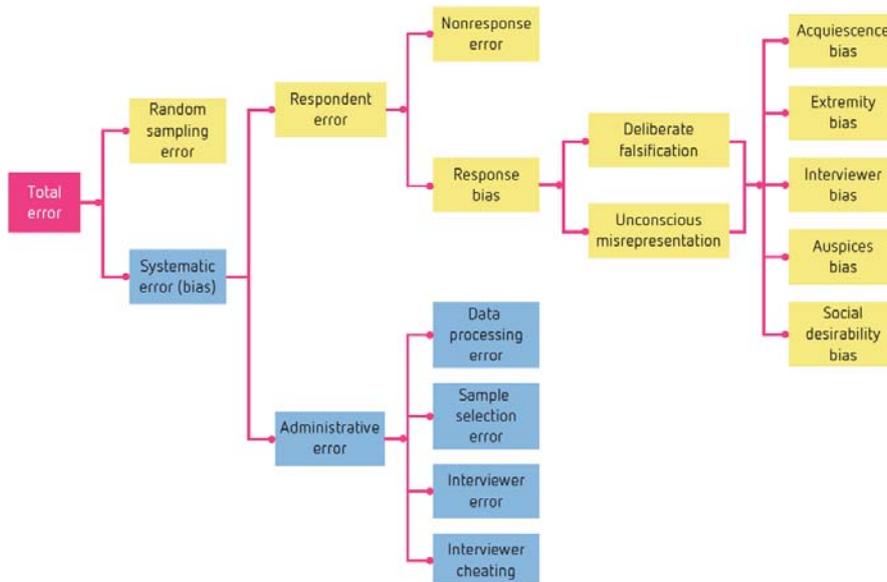
- Surveys attempt to describe what is happening or to learn the reasons for a particular marketing activity.
 - Identify characteristics of target markets.
 - Measure consumer attitudes.
 - Describe consumer purchasing patterns.

} Consumer insights



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Errors in survey research



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Errors in survey research

- Random sampling error
 - A statistical fluctuation that occurs because of change variation in the elements selected for the sample.
 - Unavoidable but can be estimated (calculating confidence intervals) or reduced (increasing sample size).



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Errors in survey research (continued)

- Systematic error
 - Systematic error results from some imperfect aspect of the research design or from a mistake in the execution of the research.
 - Sample bias exists when the results of a sample show a persistent tendency to deviate in one direction from the true value of the population parameter.
 - Can be managed (e.g. research execution).



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Classifying survey research methods

- Surveys may be classified based on the method of communication, the degrees of structure and disguise in the questionnaire, and the time frame in which the data are gathered.
 - Structure and disguised questions
 - Temporal classification



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Structure and disguised questions

- A **structured question** imposes a limit on the number of allowable responses.
- An **unstructured question** does not restrict the respondents' answers.
- An **undisguised question** is straightforward and assumes the respondent is willing to answer.
- A **disguised question** assumes the purpose of the study must be hidden from the respondent.



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Temporal classification

- **Cross-sectional study:** A study that samples various population segments and collects data at a single moment in time.
- Emphasis is placed on acquiring a large, representative sample.
- For analysis, divide the sample into appropriate subgroups (e.g. by certain demographic).



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Temporal classification (continued)

- **Longitudinal study:** A survey of respondents at different times, thus allowing analysis of continuity and changes over time.
 - **Tracking study** uses successive samples to compare trends and identify changes.
 - **Consumer panel:** A study of the same sample of individuals or households to record their attitudes, behaviour or purchasing habits over time.



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Media used to communicate with respondents

- Human interactive media
 - Face-to-face dialogue or conversation.
- Electronic interactive media
 - Reaching a large audience with personalised messages.
 - E.g. digital technology, touch screen kiosks.
- Non-interactive media
 - No dialogue or immediate feedback.
 - E.g. mail survey.



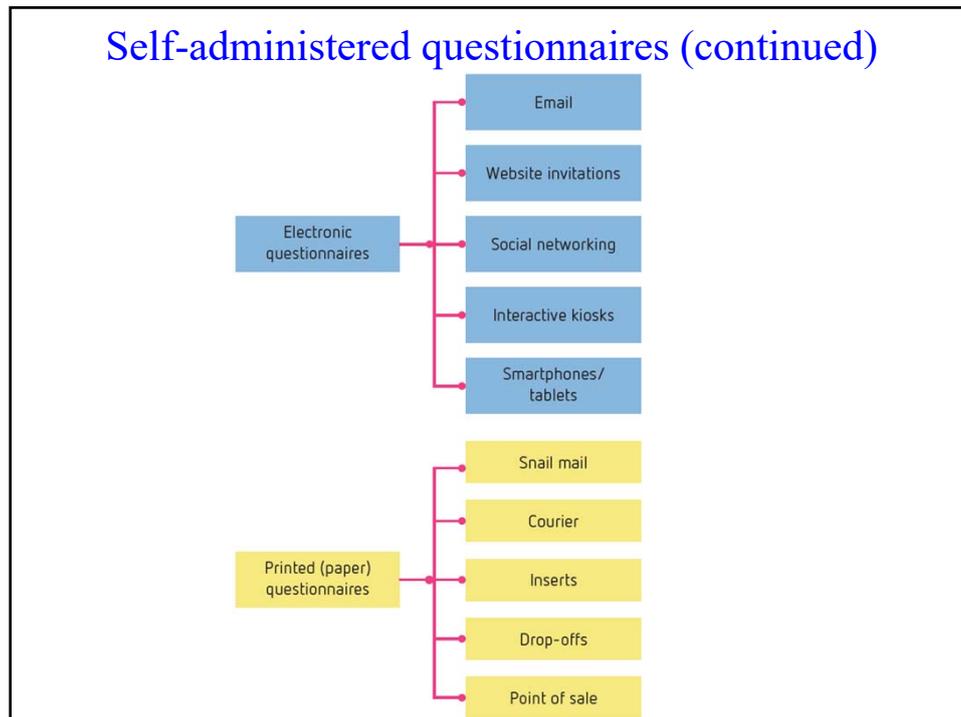
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Self-administered questionnaires

- Survey in which the respondent takes the responsibility for reading and answering the questions.
 - Mail questionnaires
 - Email surveys
 - Internet surveys
 - Kiosk interactive surveys
 - Mixed mode surveys (combining different survey methods).
- There is no best form of survey; each has advantages and disadvantages and depends on the appropriateness of the research design.



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Mail questionnaires

- Self-administered questionnaire sent to respondents through the mail
- Geographic flexibility
- Relatively inexpensive
- More convenient for respondents
- Anonymity of respondent
- Absence of interviewer
- Highly standardised questions
- Time consuming

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Response rate

- The number of questionnaires returned or completed divided by the number of eligible people who were asked to participate in the survey.
- Increasing response rates for mail surveys
 - Stamped return envelope
 - Attractive questionnaires
 - Cover letter
 - Monetary incentives or premiums
 - Interesting questions
 - Follow-ups
 - Advance notification
 - Survey sponsorship



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Email surveys

- Surveys distributed through electronic mail
 - e.g. internal surveys of employees
- Benefits
 - speed of distribution
 - lower distribution and processing costs
 - faster turnaround time
 - more flexibility and less handling of paper questionnaires.
- Email letters can be used as cover letters asking respondents to participate in an internet survey.



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Internet surveys

- A self-administered questionnaire posted on a website
 - speed and cost-effectiveness
 - visual appeal and interactivity
 - respondent participation and cooperation
 - representative samples
 - accurate real-time data capture
 - email reminders
 - personalised and flexible questioning
 - higher response rates
 - enhanced security through secure login.



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Selecting the appropriate survey design

TABLE 5.3 » ADVANTAGES AND DISADVANTAGES OF TYPICAL SURVEY METHODS

	Door-to-door personal interview	Mall intercept personal interview	Telephone interview	Mail survey	Internet survey
Speed of data collection	Moderate to fast	Fast	Very fast	Slow; researcher has no control over return of questionnaire	Instantaneous; 24/7
Geographic flexibility	Limited to moderate	Confined, possible urban bias	High	High	High (worldwide)
Respondent cooperation	Excellent	Moderate to low	Good	Moderate; poorly designed questionnaire will have low response rate	Varies depending on website; high from consumer panels
Versatility of questioning	Quite versatile	Extremely versatile	Moderate	Not versatile; requires highly standardised format	Extremely versatile
Questionnaire length	Long	Moderate to long	Moderate	Varies depending on incentive	Moderate; length customised based on answers
Item nonresponse rate	Low	Medium	Medium	High	Software can assure none

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Selecting the appropriate survey design (continued)

TABLE 5.3 » ADVANTAGES AND DISADVANTAGES OF TYPICAL SURVEY METHODS

	Door-to-door personal interview	Mall intercept personal interview	Telephone interview	Mail survey	Internet survey
Possibility for respondent misunderstanding	Low	Low	Average	High; no interviewer present for clarification	High
Degree of interviewer influence on answers	High	High	Moderate	None; interviewer absent	None
Supervision of interviewers	Moderate	Moderate to high	High, especially with central-location interviewing	Not applicable	Not applicable
Anonymity of respondent	Low	Low	Moderate	High	Respondent can be either anonymous or known
Ease of callback or follow-up	Difficult	Difficult	Easy	Easy, but takes time	Difficult, unless email address is known
Cost	Highest	Moderate to high	Low to moderate	Lowest	Low
Special features	Visual materials may be shown or demonstrated; extended probing possible	Taste tests and viewing of television advertisements possible	Fieldwork and supervision of data collection are simplified; quite adaptable to computer technology	Respondent may answer questions at own convenience; has time to reflect on answers	Streaming media software allows use of graphics and animation

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Pretesting

- Pretesting involves a trial run with a group of respondents to iron out fundamental problems in the instructions or design of a questionnaire.
- Avoids problems of having respondents misunderstand a particular question, skip a series of questions or misinterpret instructions.

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Ethical issues in survey research

- Research must protect the public from misrepresentation and exploitation.
 - Respondents have a right to refuse to participate or to answer questions.
 - Researchers need to protect the confidentiality of the participants.
 - Researchers need to record responses honestly.



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Experiment

- Experiments are a research method in which conditions are controlled so that one or more independent variables can be manipulated to test a hypothesis about a dependent variable.
 - For example, influence of brand name identification on consumers' taste perceptions.
- In an experiment, one variable (the independent variable) is manipulated and its effect on another variable (the dependent variable) is measured, while all other variables that may confound the relationship are eliminated or controlled.



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Experiment (continued)

Independent variable
e.g. *without vs. with brand label*



Dependent variable
e.g. *taste perception*

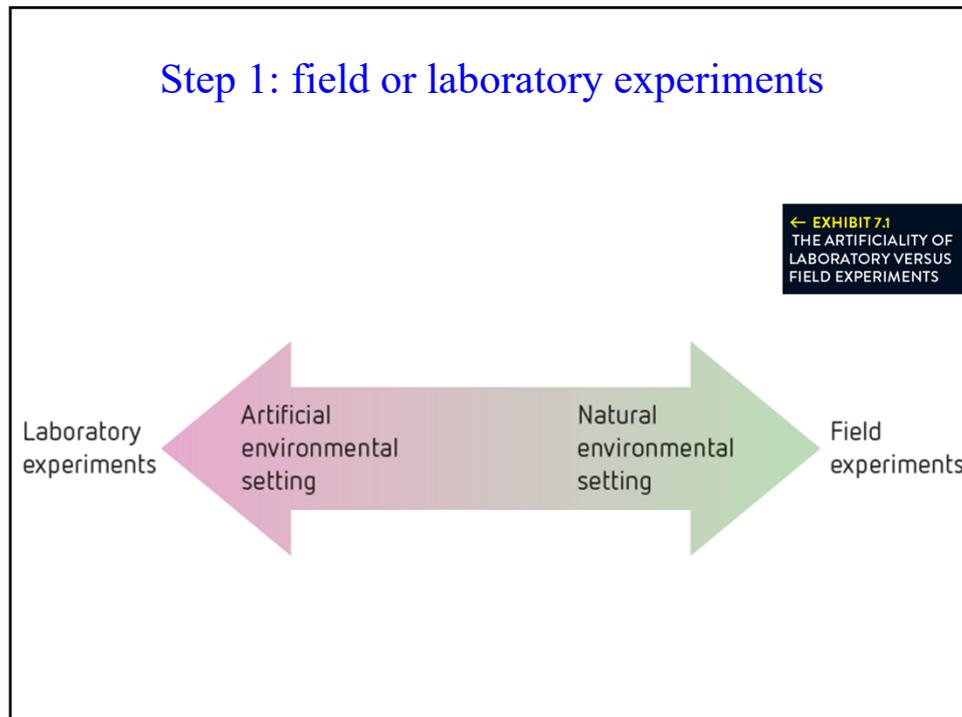
All subjects provided the product to be consumed at home to eliminate e.g. store purchase influence.

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Experimental design steps

1. Decide on a field or laboratory experimental design.
2. Decide on the choice of independent and dependent variable(s).
3. Select and design the test units.
4. Address issues of validity in experiments.
5. Select and implement an experimental design.
6. Address issues of ethics in experimentation

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Step 1: field or laboratory experiments (continued)

- **Laboratory experiments** are conducted in artificial settings over which the researcher has almost complete control.
 - E.g. viewing TV commercials for competing products and then allowing viewers to purchase in a simulated store environment.
- **Field experiments** are conducted in a natural setting in which complete control of extraneous variables is not possible (e.g. test markets).
 - E.g. fast food chains can conduct field experiments to test market a new flavour or product.

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Step 1: field or laboratory experiments (continued)

- Decisions must be made about several basic elements of an experiment, including:
 - manipulation of the independent variable.
 - selection and measurement of the dependent variable.
 - selection and assignment of subjects.
 - control over extraneous variables.



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Step 2: choosing independent and dependent variable(s)

- Manipulation of the independent variable
 - **Independent variable** can be manipulated, changed or altered independently of any other variable.
 - Hypothesised to have the causal influence.
 - There can be more than one independent variable.



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Step 2: choosing independent and dependent variable(s) (continued)

- Selection and measurement of the dependent variable
 - The criterion or standard by which the results of an experiment are judged (typically one dependent variable).
 - The value of a **dependent variable** is expected to be dependent on the experimenter's manipulation of the independent variable.



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Step 2: choosing independent and dependent variable(s) (continued)

- **Experimental treatments** are alternative manipulations of the independent variable being investigated (e.g. variations of advertising copy, graphic design, price, package size).
- There can be several experimental treatment levels (e.g. price: low vs. high).



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Step 2: choosing independent and dependent variable(s) (continued)

- **Experimental group:** Group of subjects exposed to the experimental treatment.
- **Control group:** Group of subjects not exposed to the experimental treatment; compared to the experimental group to determine any causal effects.



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Step 3: select and assign test units

- **Test units** are the subjects or entities whose responses to experimental treatments are observed or measured.
- Sample selection error
 - Self-selection bias
 - **Random sampling error:** Repetitions of the basic experiment at times favour one experimental condition over another on a chance basis.



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Step 3: select and assign test units (continued)

- Randomisation: the random assignment of subject and treatments to groups.
- **Matching**: Assigning subject to groups that ensure the groups are matched based on pertinent characteristics.



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Step 4: validity in experiments

- Experimenter needs to hold conditions constant and manipulate the treatment in a consistent manner.
- Experimenters may strive for constancy of conditions.
- **Blinding** is used to control subjects' knowledge of whether or not they have been given an experimental treatment.
- **Constant experimental error** occurs when extraneous variables are allowed to influence the dependent variable every time the experiment is repeated. This results in a systematic bias.



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Experimental validity: internal validity

- **Internal validity** refers to whether an experimental treatment was the sole cause of observed changes in the dependent variable.
- If the observed results were influenced or confounded by extraneous factors, the experiment is not internally valid.
- Factors effecting internal validity:

<ul style="list-style-type: none"> History effect Cohort effect Selection effect Maturation effect 	<ul style="list-style-type: none"> Testing effect Instrumentation effect Guinea pig effect Hawthorne effect
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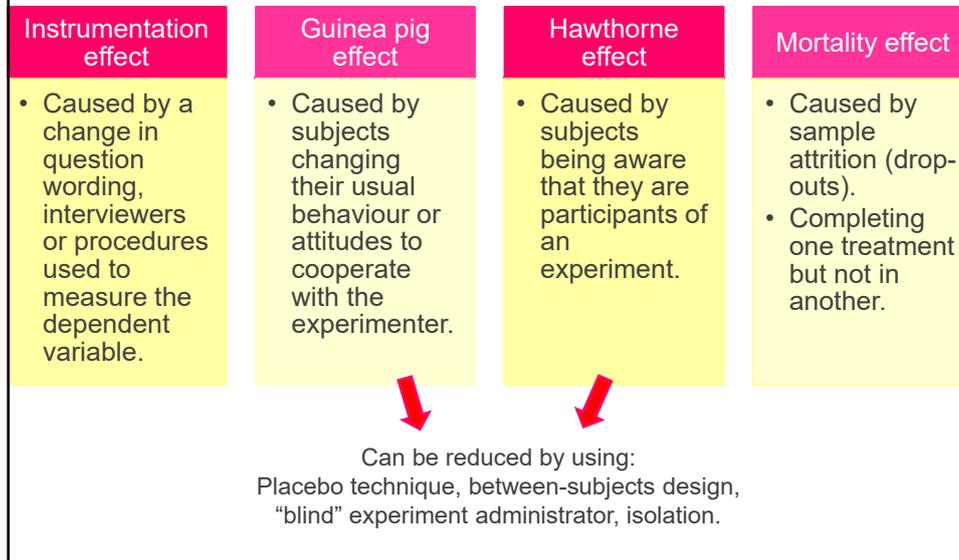
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Experimental validity: internal validity (continued)

History effect	Selection effect	Maturation effect	Testing effect
<ul style="list-style-type: none"> • Caused by specific events in the external environment beyond the researcher's control; occurring in-between measurements. • E.g. Change of marketing strategies by competitors during test marketing experiment. • <i>Cohort effect.</i> 	<ul style="list-style-type: none"> • Sample bias that occurs from differential selection of respondents for the comparison groups. • Improper sample design or sampling procedure execution. • E.g. inappropriate assignment of test subjects to experimental treatment groups. 	<ul style="list-style-type: none"> • Caused by subjects maturing or changing in some way that will affect the experiment results. • Due to tiredness, boredom etc. • Experience gained over time. 	<ul style="list-style-type: none"> • Also known as pre-testing effects. • Initial measurement alerts subjects to the nature of the experiment. • Results in them acting differently and affects the experiment's validity.

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Experimental validity: internal validity (continued)



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Experimental validity: external validity

- If the experimental situation is artificial and does not reflect the true setting and conditions in which the investigated behaviour takes place, then the experiment is not externally valid.
- Threats to internal validity jeopardise external validity.

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Experimental validity: external validity (continued)

- **Factors effecting external validity**
 - **Student surrogates**: The use of university students as experimental subjects.
 - **Extraneous variables** may have an impact on the dependent variable, thereby distorting the experiment.
 - Not always possible to control everything in marketing experiments.



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Step 5: experimental designs

- Basic experimental designs allow a single independent variable to be manipulated to observe its effect on a single dependent variable.
 - E.g. impact of price on sales.
- Factorial experimental designs allow for an investigation of the interaction of two or more independent variables.
 - E.g. impact of price and advertising on sales.
- Repeated measures
 - An experimental technique in which the same subjects are exposed to all experimental treatments to eliminate any problems due to subject differences.



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Quasi-experimental designs

- A quasi-experimental design cannot be classified as a true experiment because it lacks adequate control of extraneous variables.
 - **One-shot design:** An after-only design in which a single measure is recorded after treatment is administered.
 - **One-group pretest–posttest design:** Experimental group is measured before and after treatment is administered.
 - **Static group design:** An after-only design measuring group exposed to experimental treatment and control group without exposure to treatment. No premeasure is taken.



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Three better experimental designs

- The first step of true experimental design is randomisation of subject assignment.
 - **Pretest–posttest control group design:** Both experimental and control groups are measured before and after treatment administered on experimental group.
 - **Posttest-only control group design:** An after-only design measuring both experimental and control groups.
 - **Solomon four-group design** combines both experimental designs, providing a control for the interactive testing effect and other sources of extraneous variation.



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Time series designs

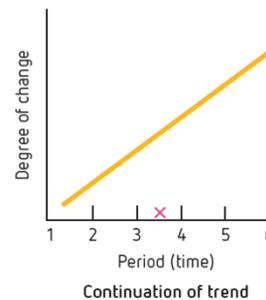
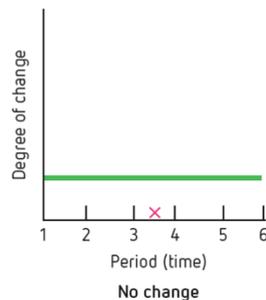
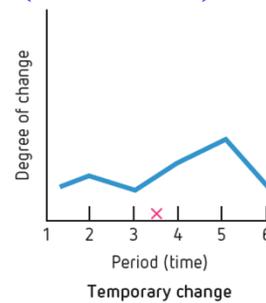
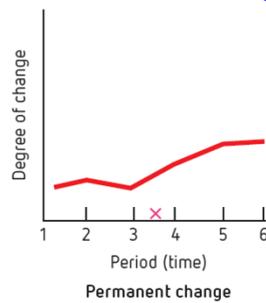
- Experiments conducted over long periods of time to distinguish temporary and permanent changes in dependent variables.
 - The design is often used in political polls tracking candidates' popularity.
- Distinguishes temporary from permanent changes.



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Time series designs (continued)

EXHIBIT 7.2 →
SELECTED TIME SERIES
OUTCOMES



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Complex experimental designs

- Designs that isolate the effects of confounding extraneous variables and allows for manipulation of more than one independent variable.
 - completely randomised designs
 - randomised block designs
 - factorial designs.



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Completely randomised design

- Uses a random process to assign subjects to treatments to investigate the effects of only one independent variable.
- The following table shows the response rates (the dependent variable) of each treatment group to incentives to respond to a mail survey.

TABLE 7.1 » A COMPLETELY RANDOMISED DESIGN

	Experimental treatment		
	Control: No incentive	\$1 personal incentive	\$1 charity incentive
Response rate	23.3%	26.0%	41.3%
Number of observations (n)	150	150	150

Overall response rate $136/450 = 30.2$ per cent

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Randomised block design

- An extension of the completely randomised design in which a single extraneous variable that might affect test unit's response to the treatment is identified and its effect blocked.
- The following table shows how geographic region affects attitudes towards food packaging.

TABLE 7.2 » RANDOMISED BLOCK DESIGN

Treatment	Percentage who purchase product			Mean for treatments
	South Australia	Western Australia	New Zealand	
Package A	14.0% (Adelaide)	12.0% (Perth)	7.0% (Auckland)	11.0%
Package B	16.0% (Port Augusta)	15.0% (Albany)	10.0% (Christchurch)	13.6%
Mean for cities	15.0%	13.5%	8.5%	

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Factorial design

- Investigates the interaction of two or more independent variables on a single dependent variable.
 - Main effect: The influence of a single independent variable on a dependent variable
 - Interaction effect: The influence of combinations of two or more independent variables on a dependent variable.
- The table below shows a 2×2 factorial design that illustrates the effects of gender and magazine ad content on believability.

TABLE 7.4 » A 2×2 FACTORIAL DESIGN THAT ILLUSTRATES THE EFFECTS OF GENDER AND AD CONTENT ON BELIEVABILITY

	Ad A	Ad B	
Men	60	70	65
Women	80	50	65
Mean for cities	70	60	
Main effects of ad			

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Ethical issues in experimentation

- A subject's right to be informed is prominent in experimentation, but researchers often intentionally hide the true purpose of their experiments.
- **Debriefing** is the process of disclosing the nature and purpose of the experiment after it has been completed.
- There is also subject's right to safety from physical and mental harm.



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Next Topic: MR4 – Questionnaire and Sampling

- Questionnaire Design and Sampling Strategies
 - Questionnaire Design
 - Sampling Strategies



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