

Sampling Bias

Lesson objectives

PART 1:

-describe bias

-identify various forms of bias and how they can affect the results of a study

PART 2:

-describe characteristics of an effective survey (appropriate

1.1

Lesson objectives

Teachers' notes

Lesson notes

PART 1

A. Take Note:

bias—an unintended influence on a data-gathering method (Nelson, p113)

The data gathering method in the example provided is a *written survey*. There are other forms of data collection that you will read about in Part II.

Example

Student Survey of Environmental Support
Sponsored by the Greenteam

- What is your hometown? _____
- On a scale of 1 to 5, to what degree is your hometown environmentally conscious?

1	2	3	4	5
		Medium		Wow
- When you finish a can of pop in the cafeteria you
 - put the can in the recycling bin
 - toss it in the regular garbage
 - deposit it under the table
- Your family saves water by
 - taking showers instead of baths
 - putting a brick in the toilet tank
 - washing the dishes once a week
- You want to join the school environment club
 - a whole lot
 - if you had more free time
 - only for the Earth Walk event
- Environmental topics should be addressed
 - across all curricula
 - especially in Science and Geography
 - in every mathematics course
 - all of the above
- Your attitude toward improving the environment is
 - highly supportive
 - mostly supportive
 - supportive
- Canada needs more toxic waste dumps.

<input type="checkbox"/> Agree	<input type="checkbox"/> Disagree
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- Based on the graph shown, do you agree that more adults are doing their part for the environment?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
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Why do you think this is so?

Environment Survey

	Strongly support
	Support on weekends
	Detest environmental causes
	Don't care

Nelson, p116

Activity 1

Do any of the survey questions and/or the design of the survey have the potential for biasing the results of the written survey?

If so, identify the source(s) of bias AND explain why/how it/they will influence the results. Then rewrite the identified bias-producing parts of the survey so as to minimize **response bias**. You can use the space provided on the next page.

response bias—factors in the sampling method that influence the result (Nelson, p113)

B. Types of Bias

Through the introductory activity, you were introduced to a particular form of bias--*response bias*.

There are several other kinds of bias (see below).

Activity 2: Matching Biases

Match each definition with the form of bias provided on the right.

--results are influenced because surveys are not returned

» Drag text here

--polling different sized groups equally results in overrepresentation of one group

» Drag text here

--the sample does not accurately represent the population

» Drag text here

--the sampling method influences the results

» Drag text here

SAMPLING BIAS

NON-RESPONSE BIAS

HOUSEHOLD BIAS

RESPONSE BIAS

2. Read about the advantages and disadvantages of written questionnaires, and then answer the following.

- a) With regards to written questionnaires, what is one major drawback?

- b) What type of information should be requested when using a written questionnaire?

3. Read "Questionnaire Design-General Considerations", and then answer the following.

- a) What is the most effect strategy for maximizing the response rate to a written questionnaire?

- b) What might be wrong with a written questionnaire if there is little chance that the person will complete it?

- c) How can the respondent's interest be held when they are presented with completing a written questionnaire?

- d) Describe the final test of a questionnaire.

4. Read "Qualities of a Good Question". Keep in mind that you are to provide an example (from the article or your own) that explains/describes each quality.

QUALITY	EXAMPLE
Evokes truth	
One-dimensional answers	
Accommodates all possible answers	
Mutually-exclusive options	
Produces variability	
Flow of Questions	
No Pre-suppositions	

#4. contd.

desired answer implied	
use of adjectives	
familiarity of words	
branching questions	
ranking a series of items	

5. List words/phrases that should not be included on written questionnaires (i.e., since they can have variable meanings).

SHOW WHAT YOU KNOW #2

Your next assignment is to begin the process of designing effective questions. Eventually, you will need to take into account the table of qualities you just completed.

Assignment

Answer the problems that follow using a clicker.

1 Which of the following is considered a CLOSED QUESTION?

A What is the most important issue for teenagers in your community?

B Which of these issues is most important for teenagers in your community?

homelessness

youth gangs

poverty

drug use

crime

2 Complete this CHECKLIST question by checking those sports that you watch on TV.

A basketball

B baseball

C hockey

D soccer

E football

F other

3 Complete the following RANKING QUESTION:

Here is a list of concerns for teenagers. Please rank them in order of importance from 1 (most important) to 4 (least important)

___ graduating high school

___ getting a summer job

___ choosing a career

___ finding a friend

___ learning to drive

4 Complete the following RATING QUESTION:

How satisfied were you to hear that the Toronto Maple Leafs made the playoffs?

A very satisfied

B satisfied

C somewhat dissatisfied

D very dissatisfied

E other

5 Which question type (A to D) and style (E, F) does the following fall under:

- A Rating
- B Information
- C Ranking
- D Checklist
- E Closed
- F Open

Circle the appropriate response.

(a) Gender:	M	F
(b) Age:	under 14	15 or 16
	17 or 18	19 and over

KEY IDEAS

primary data—data collected by the researcher

secondary data—data collected from other sources

question styles—open questions (respondents reply in their own words); closed questions (respondents are given a limited number of responses from which to choose)

question types—information questions; checklist questions; ranking questions; rating questions

Nelson, p105

Closed Questions

Questions that require the respondent to select from a given list of responses, or has an exact response, are closed. These answers are then easily analyzed; however, the options presented may bias the results.

Nelson, p104

How can you account for a wide variety of responses and still use a closed question?