Survey Error: Focus on Systematic Error

(Click icon for audio)
Survey results make better headlines than the errors which they may include. A finding such as this one probably includes errors of both response and nonresponse type.

Extra! Extra! Survey shows that average Lennon University graduate of 1977 is now earning $80,000 per year!
Total Survey Error: Components

- Total error
  - Random sampling error
  - Systematic error (bias)
Random Sampling Error

Statistical fluctuation that occurs because of chance variation in the elements selected for the sample
Systematic Error

Caused by some imperfect aspect of the research design or a mistake in research execution
Categories of Survey Errors

- Total error
  - Systematic error (bias)
    - Random sampling error
      - Respondent error
        - Nonresponse error
          - Acquiescence bias
        - Response bias
          - Extremity bias
          - Interviewer bias
          - Auspices bias
          - Social desirability bias
        - Deliberate falsification
          - Unconscious misrepresentation
          - Data processing error
            - Sample selection error
              - Social desirability bias
              - Interviewer error
              - Interviewer cheating
            - Social desirability bias
Respondent Error: Components

Respondent error

Non-response error

Response bias
Non-response Error

- Non-respondents
  - Refuse to cooperate
  - Not-at-homes
- Self-selection bias
  - Over-represents extreme positions
  - Under-represents indifference
- Varies by type of interview
Why People Cooperate

- To be supportive/helpful
- Have a social interaction
- Curiosity
- Remuneration
Factors Contributing to Refusal

- Fear/anxiety
- Invasion of privacy
- Hostility toward
  - Survey sponsor
  - Topic of interview
  - Interviewer
Response Bias

Bias that occurs when respondents tend to answer questions with a certain slant that consciously or unconsciously misrepresents the truth.
Response Bias: Components

Response bias

Deliberate falsification

Unconscious misrepresentation
Unwillingness to Respond Accurately

- Invasion of privacy
- Time pressure and fatigue
- Physical/social environment
- Questionnaire-specific issue
  - Question/response wording
  - Layout
- Mischievous respondents
Response error is a type of informational error possible whenever survey research is undertaken. Besides misinterpreting questions and knowingly providing incorrect responses, some subjects will attempt to impress you with their creativity.
Inability to Respond Accurately

- Inarticulate
- Ignorant
  - Asked about other people
  - Asked to predict own behavior
  - Asked question meant for other people
Intentions Poor Purchase Predictor

Purchase intention

100 people stating that they intended to buy brand A

Purchase behavior during next 12 months

44 bought an appliance
56 did not buy an appliance
30 bought brand A
14 bought another brand
Excuse me, sir... Do you expect to be buying a twin engine private airplane next year?

I sure do—as soon as I make the final payment on my '75 Plymouth!
I AM FROM THE CENSUS, MADAM. WE ARE TRYING TO FIND OUT HOW MANY PEOPLE LIVE IN THE UNITED STATES.

OH, HAVE YOU COME TO THE WRONG PLACE! I DON'T HAVE THE FAINTEST IDEA.
Inability to Respond Accurately

• Faulty memory
  – Only ask about recent events
  – Problem with questions about behavior over time (e.g., frequency)
  – Telescoping
    • Everything happened yesterday
Unconscious Misrepresentation: Components

- Acquiescence bias
- Extremity bias
- Interviewer bias
- Auspices bias
- Social desirability bias
Acquiescence Bias

Response bias due to some people tending to agree with all questions or to concur with a particular position.
Extremity Bias

Response bias due to response styles that vary from person to person; some people tend to use extremes when responding to questions
Interviewer Bias

Response bias that occurs because the interviewer’s presence influences answers.
Tell me, sir; don’t you agree that our new El Gulpo steak sauce tastes better than any you’ve ever tried before?

There’s no doubt about it! This is the best (munch) steak sauce I’ve ever tasted. Do you have any more of that filet mignon? I didn’t have a chance to eat breakfast today.”

Possible sources of measurement error include the respondent, the measurement procedure, and the situation in which the measurement is taken.
Auspices Bias

Response bias due to being influenced by the organization conducting the study
Social Desirability Bias

Bias caused by respondents’ desire, either conscious or unconscious, to gain prestige or appear in a different social role.
When respondents believe that legitimate responses may have social or personal implications that are undesirable, they may be less than candid in a survey. One way to minimize this problem is through the utilization of projective techniques.

SURE IT COST $14,000. BUT IT'S EASY ON GAS AND WON'T DEPRECIATE AS QUICKLY. MY MOTIVES WERE BASICALLY ECONOMIC.
With survey data collection, questions often are asked which require the respondent to deal (1) with issues involving a low level of conscious action, or (2) with issues the responses of which have socially acceptable answers. When such issues must be explored, data collection by observation may be more valid than data collection by survey.
Systematic Error: Components

- Systematic error (bias)
  - Administrative error
  - Respondent error
Administrative Error

• Improper administration of research
• Interviewer cheating: Filling in fake answers or falsifying interviewers
  – Why commercial houses validate roughly 10-15% of completed interviews
• Data processing error: Incorrect data entry, computer programming, or other procedural errors during analysis stage
Interviewer Error

• Subtle source of cues
  – Can inadvertently reinforce some responses

• Appearance of incompetence
THIS IS A SURVEY....
WHO ARE YOU VOTING AGAINST FOR PRESIDENT?

ED FISCHER
Interviewer Error

Insufficient or poor probing
“Do you realize that choice puts you in the 2% lunatic fringe?”
A considerable amount of important information can be obtained in interview situations through the process of probing. Interviewers should be trained to probe and most probing possibilities should be considered in advance of the interview itself. (THE WIZARD OF ID by permission of Johnny Hart and Field Enterprises, Inc.)

I'm taking a survey, sir...

I'll bet you can't tell me what you had for dinner last night.

Bat wing casserole and tossed iguana salad.

That's terrific! How'd you do it?

I stuffed cotton up my nose.
Interviewer Error

• Sample selection error: Improper sample design or sampling procedure execution
• Selecting unqualified respondents
Checklist for Unacceptable Questionnaires

• Major portions of questionnaire or key questions left unanswered
• Evidence that respondent did not understand instructions or did not take task seriously
• Missing pages
• Respondent not qualified for target population
• Questionnaire returned after cutoff date
Recap

Sources of systematic error

• Respondent
• Administrator
• Interviewer