Nonresponse Effect in Large Scale Student Assessment

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Introduction

- What is nonresponse effect?
- Causes of nonresponse
- How to handle nonresponse?
- How to study nonresponse effect?
What is Nonresponse Effect?

- Nonresponse effect occurs when the individuals responding to a survey differ from nonrespondents on variables relevant to the survey topic.

population

sample
What is Nonresponse Bias?

- Nonresponse bias

\[
\text{bias} = (1 - r)(\overline{x}_R - \overline{x}_{NR})
\]

If \( r = 1 \), bias = 0

If \( r \approx 0 \), bias \( \approx (\overline{x}_R - \overline{x}_{NR}) \)
National Survey of Student Engagement (NSSE)

- Measure effective educational practices
- Began in 2000
- Surveyed more than 1000 four-year colleges and universities
- More than 560 colleges and universities participated in 2006
- Average response rate ~40%

http://www.nsse.iub.edu
Causes of Nonresponse
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- Inaccessibility
- Inability
- Carelessness
- Noncompliance
NSSE Nonrespondents

- Male
- Minority students
- Part-time students
- Students who drop out before survey administration
How to handle Nonresponse?

- Compare respondents to population on characteristics known before the study
- Compare respondents to nonrespondents on characteristics known before the study
- Compare early to late respondents
- Double-dip – sample nonrespondents
- Ignore nonrespondents
NSSE Survey Administration

- Web, Paper, Web+
- Web: Everything through the Internet
- Paper: Contact students by mail, students can choose to reply by mail or web
- Web+: Hardcopy paper survey is used to supplement web survey
- A student may be contacted 5 times at most

NSSE Survey Administration Modes:
http://nsse.iub.edu/html/survey_modes.cfm
Time is the Key

The Number of Days between Contact and Responses

Paper Mode: 13.08
Web-only Mode: 0
Web+ Mode: 11.3

Paper mean  Web mean
Response to the Wave of Contact

**Paper Mode**
- 1st contact: 19%
- 2nd contact: 19%
- 3rd contact: 19%
- 4th contact: 2%
- 5th contact: 2%

**Web Mode**
- 1st contact: 37%
- 2nd contact: 14%
- 3rd contact: 14%
- 4th contact: 12%
- 5th contact: 12%

Legend:
- Blue: 1st contact
- Maroon: 2nd contact
- Yellow: 3rd contact
- Light Blue: 4th contact
- Purple: 5th contact
Compare Early to Late Respondents

- Correlations between response time, contact wave, individual items, and NSSE benchmarks
- Multivariate Analysis of Covariance (MANCOVA)
- Descriptive statistics (charts)
Results

- No significant correlations between response time, contact wave, and survey items

- MANCOVA showed that wave of contact is not a factor that affects NSSE benchmarks \((p = 0.256)\)
Descriptive Statistics

Level of Academic Challenge

Complete after 1st contact
Complete after 2nd contact
Complete after 3rd contact
Complete after 4th contact
Complete after 5th contact
What Have We Learned?

- Improve Survey Response Rate
  - Remove roadblocks (SPAM filter...etc.)
  - Inform students about the survey beforehand
  - Avoid bad timing (Mid-term exam, Final week...etc.)
  - Provide incentives

- Study Nonresponse Effect
  - Do not ignore nonresponse effect
  - Study nonresponse effect
What to do if Nonresponse Bias exist?

- Nonresponse Bias

\[ bias = (1 - r)(\bar{x}_R - \bar{x}_{NR}) \]

- Increase Response Rate
- Report the possibility of nonresponse bias
- Oversample student populations that is known to have low response rate
- Consider other research or sampling methods
Discussion and Comments

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