Survey Response Rate and Nonresponse Error in the National Survey of Student Engagement

Goals
- What is response rate?
- NSSE response rate
- What is nonresponse effect?
- Causes of nonresponse
- How to handle nonresponse?
- How to study nonresponse effect?

Myth #1
Increasing the number of respondents will always lead to a better population estimation

Myth #2
Low response rates is the cause of nonresponse bias/ error

Define response rates
- The American Association for Public Opinion Research (AAPOR)
- Response rates (6)
- Cooperation rates (4)
- Refusal rates (3)
- Contact rates (3)

Components of response rates calculation
- I = Complete interview
- P = Partial interview
- R = Refusal and break-off
- NC = Non-contact
- O = Other
- UE = Unknown eligibility
### NSSE response rates

- NSSE Response rates

\[
RR = \frac{(I + P)}{(I + P) + R + O}
\]

- I = Complete survey
- P = Partial completed survey
- R = Refusal and break-off
- O = Other

### 2006 NSSE Response Rates by Carnegie Classification

![Graph showing response rates by Carnegie Classification]

### Errors in Survey Research

- **Sampling error**
- **Nonresponse error**
- **Measurement error**
- **Coverage error**

### Sampling Error

- Assumes random sampling
- An estimate of the margin likely to contain your “true” score, for example:
  - If 60% of your students reply “very often” and the sampling error is ± 5%, it is likely that the true value is between 55% and 65%.
  - More respondents usually leads to smaller sampling error, but it is not always true

### Sample size for the 95% confidence level with 5% SE

<table>
<thead>
<tr>
<th>Population Size</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>200</td>
<td>132</td>
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<tr>
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<td>2000</td>
<td>322</td>
</tr>
<tr>
<td>6000</td>
<td>361</td>
</tr>
</tbody>
</table>

### Sampling Error vs. Sample Size

![Graph showing sampling error vs. sample size]

Sample size for the 95% confidence level with 5% sampling error
Sampling Error vs. Sample Size

Sample size for the 95% confidence level with 3% sampling error

Myth #1

Increasing the number of respondents will always lead to a better population estimation

What is Nonresponse Effect?
- Nonresponse effect occurs when the individuals responding to a survey differ from nonrespondents on variables relevant to the survey topic

What is Nonresponse Bias?
- Nonresponse bias
  \[ bias = (1 - r)(\bar{x}_R - \bar{x}_{NR}) \]
  
  If \( r = 1 \), bias = 0
  
  If \( r = 0 \), bias \( \approx (\bar{x}_R - \bar{x}_{NR}) \)

Myth #2

Low response rates is the cause of nonresponse bias/error

Causes of Nonresponse
Causes of Nonresponse
- Inaccessibility
- Inability
- Carelessness
- Noncompliance

NSSE Nonrespondents
- Female
- 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

Time is the Key

Response to the Wave of Contact

NSSE Survey Administration Modes:
http://nsse.iub.edu/html/survey_modes.cfm
**NSSE Nonrespondent Study**

- Interview nonrespondents
- T-test
- Regression Analysis
- Compare early to late respondents
- Correlations between response time, contact wave, individual items, and NSSE benchmarks
- Multivariate Analysis of Covariance (MANCOVA)
- Descriptive statistics (charts)

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**Reason of not responding**

- Never received invitation: 44%
- Too busy: 26%
- Did not see any personal benefit in completing: 11%
- Don't remember why: 7%
- Either lost invitation or forget about it: 5%
- Completed survey already: 3%
- Upset with institution: 3%
- Other: 1%

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**Results**

- No consistent trend showing nonresponse bias
- 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 ($p = .256$)

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**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

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**What to do if Nonresponse Bias exist?**

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

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**Questions & Discussion**

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