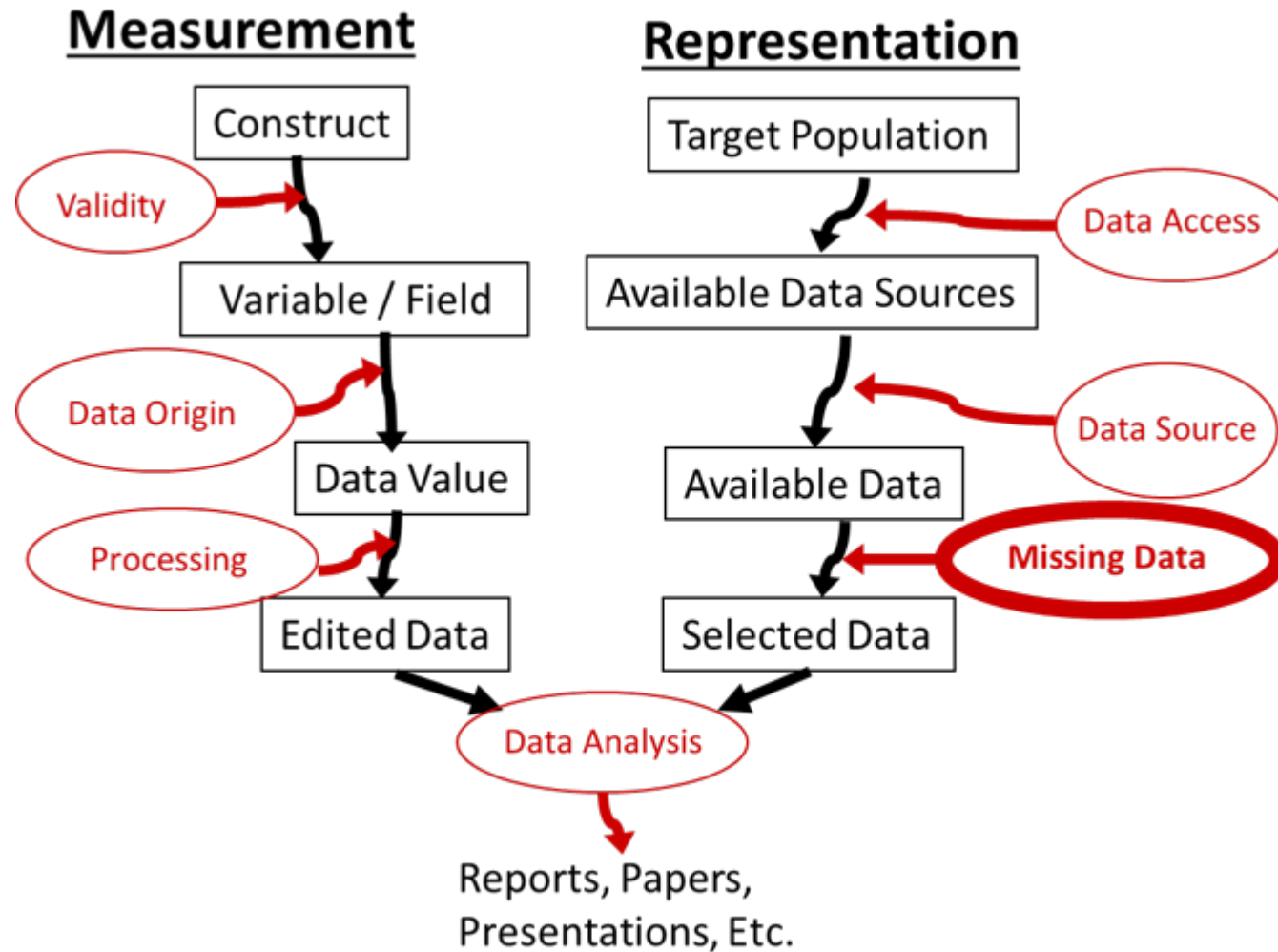


Data Missingness Threats for Designed Data By James Wagner

Dimensions of TDQ



Data Missingness Threats for Designed Data

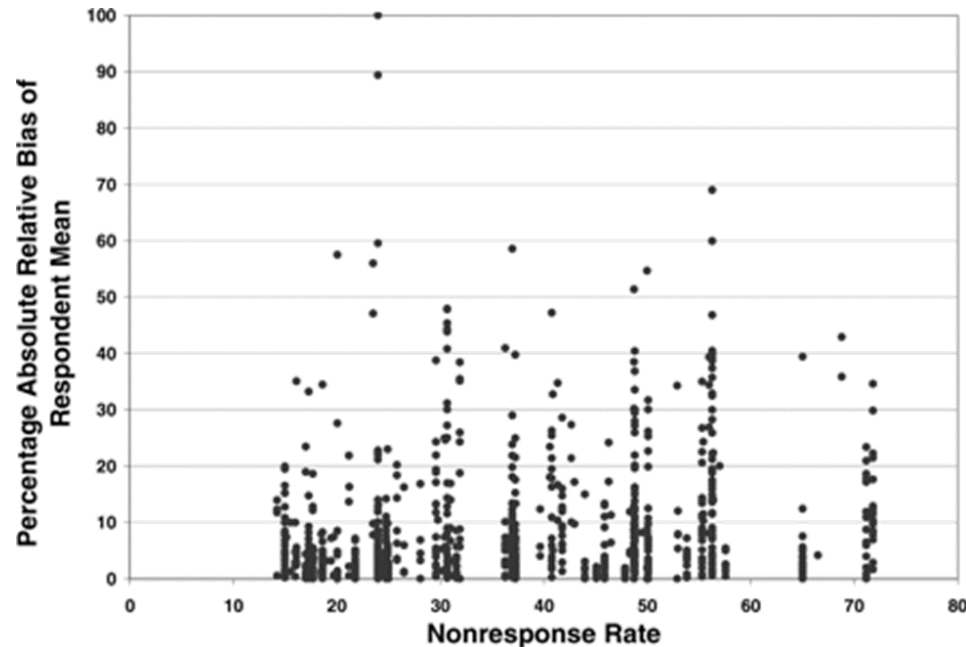
- Survey nonresponse.
 - **Unit:** failure to participate.
 - Much research in this area.
 - Mechanism:
 - Failure to contact.
 - Refusal to participate.
 - Other?
 - **Item:** failure to respond to a survey item.

Nonresponse and Nonresponse Bias (1)

- Does survey nonresponse lead to bias in estimates?
- It depends...
- Are *respondents* and *nonrespondents* **different**?
- $B(\bar{y}) = \frac{m}{n} (\bar{y}_r - \bar{y}_{nr})$
 - where $\frac{m}{n}$ is the nonresponse rate (m is the number of nonrespondents and n is the sample size).
 - and $(\bar{y}_r - \bar{y}_{nr})$ is the difference between nonrespondents and respondents with respect to the mean of y .
- Unfortunately, we almost never know \bar{y}_{nr} .

Nonresponse and Nonresponse Bias

- Specialized studies where $(\bar{Y}_{\text{sub-NR}})$ is known.
- **Key Point:** Any given statistic within a survey may have high or low bias.



Source: Groves and Peytcheva (2008).

Survey Nonresponse: Item Nonresponse

- **Item nonresponse**: failure to respond to a question.
 - For example, **sensitive items** tend to have higher rates of missing data.
 - Respondents may **breakoff** during a survey, leaving some questions unanswered.
 - If persons with certain values (high or low) are less likely to respond, **mechanism** may be non-ignorable, meaning that adjustments are more difficult.

Unit Nonresponse: Example

- Unit nonresponse: American Time Use Survey (*Abraham, et al., 2006*).
 - Sampled from American Community Survey.
 - Response rate about 60%.
 - Noncontact=60% of nonresponse, Refusal=40%.
 - Using measures from ACS:
 - Busier people **not** less likely to respond.
 - More socially integrated persons **are** less likely to respond.

Item Nonresponse: Example

- Item nonresponse: Interviewer-Respondent Interactions (*Vercruyssen et al., 2017*).
 - *Do interviewers make a difference in item missingness?*
 - Examine interactions between interviewer (I) and respondent (R) characteristics.
 - Found significant interactions between gender and age, but **not** education combinations of I and R.
 - Male-Male combination reduces item nonresponse.
 - Similar age I-R combination reduces item nonresponse.

What's next?

- Next, we will look at **demonstration of using imputation** for missing values.



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