Testing Bias

Biased questions may often be unintentional and not obvious

Think about words or phrases like:

- On deck
  (baseball term could be more familiar to boys)
- Regatta
  (likely more familiar to higher income students)
- Cricket
  (a sport in England or South Asia, but an insect in the US)
- What color is a lemon?
  (in Mexico limón is a lime)
Testing Bias

Recall nomological net

Theoretical Level

Hypothetical constructs

Observational Level

Operational definitions


Newsom, Spring 2017, Psy 495 Psychological Measurement
Testing Bias

Test bias—groups differ on measure but not really on construct


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Group differences on construct

Testing Bias Consequences

Small hypothetical gender bias in math SAT scores

Newsom, Spring 2017, Psy 495 Psychological Measurement
Item Discrimination Index

\[ D = p_{\text{high}} - p_{\text{low}} \]

\( p_{\text{high}} \) is the proportion of high scorers on the test getting the item correct, and \( p_{\text{low}} \) is the proportion of low scorers on the test getting the item correct.

High \( D \) values indicate bigger difference between higher and lower scorers, so the item does a better job of discriminating who knows the material more (but no conventional cutoff).
Factor Analysis

Multigroup confirmatory factor model

Group A

Math Ability

\[ y_1 \]
\[ y_2 \]
\[ y_3 \]
\[ y_4 \]

Group B

Math Ability

\[ y_1 \]
\[ y_2 \]
\[ y_3 \]
\[ y_4 \]