03 – Reliabilitas

Reliability Overview

- **Reliability** (Peter, 1979) = p.57

    the degree to which measures are free from error & yield
        consistent results.

- Konsep pengukuran pada *Classical Test Theory*: p.58

    X = T + E

- Across people, variability in observed scores is equal to true score variance plus error variance =

$$\sigma^2_{observed} = \sigma^2_{true} + \sigma^2_{error}$$

- **Reliability coefficients:** to estimate both true & error variance associated with our observed test scores.

$$r_{xx} = \frac{\sigma^2_{true}}{\sigma^2_{observed}} = \frac{\sigma^2_{true}}{\sigma^2_{true} + \sigma^2_{error}} \qquad r_{xx} = \frac{\sigma^2_{observed} - \sigma^2_{error}}{\sigma^2_{observed}}$$

Interpreting the Size of the Reliability Coefficient

- Reliability is perfect when there is no measurement error (random error).
- How much reliability is considered acceptable for a psychometric test? p.59
  - The general rule is that a reliability coefficient of .70 or greater is desired.
  - But...

- **Reliability and Test Length** p.60

Estimating Reliability

- When estimating reliability, however, it is essential to recognize that the differing methods for computing reliability consider different sources of error.
- **Measurement Error**: p.69
  occur when true scores remain the same, but observed scores differ from one test to another.
- Factors that can influence the reliability estimate of a measure (Magnusson (1967): p.69
  1. measurement errors (administration of the test, guessing, and scoring),
  2. lack of agreement between parallel measurements of true scores,
  3. fluctuation in true scores, and
  4. memory effects

Estimating Reliability

Table 6.1 Sources of Error and Their Associated Reliability Statistics

Source of Error	Reliability Coefficient	Reliability Estimate	Statistic
Change in Examinees	Stability	Test/retest	r_{12}
Content Sampling	Equivalence	Parallel forms	$r_{xx'}$
Content Sampling	Internal consistency	Split-half Alpha	r_{x1x2} α
Inter-rater	Rater consistency	Inter-rater agreement	R_{r1r2} kappa