

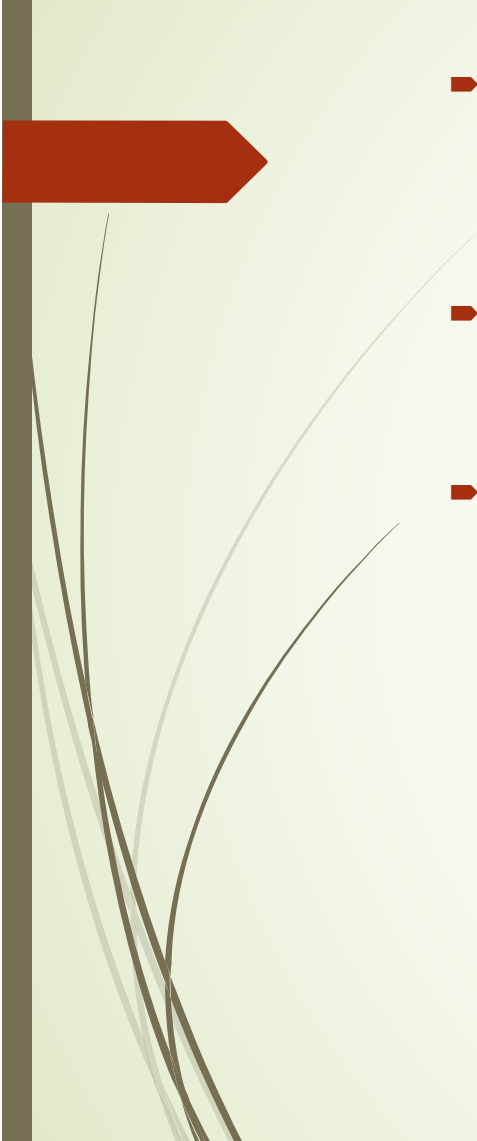


Heteroscedasticity



Note

- ▶ GLS – we minimize a weighted sum of residual squares with $w_i = \frac{1}{\sigma_i^2}$ acting as the weights
- ▶ OLS – we minimize an unweighted equally weighted residual sum of squares (RSS)
- ▶ In GLS the weight assigned to each observation is inversely proportional to its σ_i , that is, observations coming from
 - ▶ a population with larger σ_i will get relatively smaller weight
 - ▶ and those from a population with small σ_i will get proportionately larger weight in minimizing the RSS

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- ▶ In the (unweighted) OLS, each \hat{u}_i associated with points A, B, and C will receive the same weight in minimizing the RSS. The \hat{u}_i^2 associated with point C will dominate the RSS
 - ▶ In GLS the extreme observation C will get relatively smaller weight than the other two observations
 - ▶ In estimating the PRF more reliably we would like to give more weight to observations that are closely clustered around their (population) mean than to those that are widely scattered about