Regression Coefficient b_r

$$b_r = \frac{Cov(u, \tilde{y})}{var(\tilde{y})}$$

□ For $var(\tilde{y})$, we have an additional variance component:

$var(y)$ using for $y = \mu + u + e \longrightarrow$ temp env (te)

permanent environment (pe

$$var(y) = var(\mu + u + e)$$
$$= var(\mu\} + u + pe + te)$$
$$= \underbrace{var(\mu)}_{=\emptyset} + var(u) + var(pe) + var(te)$$
$$= var(u) + var(pe) + var(te)$$

□ Define Repeatability t

$$t = \frac{var(u) + var(pe)}{var(y)} = \frac{\sigma_u^2 + \sigma_{pe}^2}{\sigma_y^2}$$