

The Method of Path Coefficients of Sewall Wright

by Herman Rubin

January 2, 1948

Let us consider a system of equations of the type

$$(1) \quad y_{ij} = \sum_{f=1}^G \alpha_{if} y_{jf} + \sum_{k=1}^K \gamma_{ik} z_{kj} + u_{ij},$$

where the quantities u_{ij} are independently distributed with mean 0 and variance σ_{ij}^2 and if $i_0, i_1, i_2, \dots, i_n$ is a sequence of positive integers, each $\leq G$, and $i_0 = i_n$, then the a priori restrictions imply that

$$(2) \quad \prod_{i=1}^n \alpha_{i-1, i} = 0,$$

and the quantities z_{kj} have, for each j , the covariances $\rho_{kk'}$, and are distributed independently for different j , and are independently distributed of the u 's.

Then the method of path coefficients is the process of estimating the α 's and γ 's, subject to the a priori restrictions, by the method of moments.