$$\left.\begin{array}{l} \boldsymbol{Z}_{i,a} \mid \boldsymbol{P}_{i,a} \sim \text{Multinomial}(n_{i,a}; \boldsymbol{P}_{i,a}) \\ E(\boldsymbol{P}_{i,a}) = \boldsymbol{\pi}_a \\ \text{Var}(\boldsymbol{P}_{i,a}) = \rho_a^2[\text{diag}(\boldsymbol{\pi}_a) - \boldsymbol{\pi}_a\boldsymbol{\pi}_a'] \end{array}\right\} OM$$

$$\left.\begin{array}{l} \sum_{i=1}^K \mathbf{D}_i'\mathbf{V}_i^{-1}\mathbf{R}_i = 0 \\ \sum_{i=1}^K \mathbf{R}_i\mathbf{V}_i^{-1}\mathbf{R}_i = mK \end{array}\right\} GEE$$