A.2.4 Ordinal logistic regression

Model description In this model the response variable y takes on values from the ordered set $\{y^{(s)}, s = 1, \ldots, S-1\}$, where $y^{(1)} < y^{(2)} < \cdots < y^{(S)}$. For $s = 1, \ldots, S-1$ define $P_s = P(y \leq y^{(s)})$ and $\kappa_s = \log[P_s/(1-P_s)]$. To allow κ_s to depend on covariates specific to the ith observation $(i = 1, \ldots, n)$ we introduce a disturbance η_i of κ_s:

$$P(y_i \leq y^{(s)}) = \frac{\exp(\kappa_s - \eta_i)}{1 + \exp(\kappa_s - \eta_i)}, \qquad s = 1, \ldots, S-1.$$

with

$$\eta_i = \mathbf{X}_i \beta + u_{j_i},$$

where $\mathbf{X}_i$ and β play the sample role as in Example 1-3, the u_j $(j = 1, \ldots, q)$ are independent $N(0, \sigma^2)$ variables, and j_i is the latent variable class of individual i.

Files http://otter-rsch.com/admbre/examples/socatt/socatt.html

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