STA 4504/5503: Exam 2

## Formulas

$\text{logit}(\pi) = \alpha + \beta_1 x_1 + \cdots + \beta_k x_k \qquad \pi = \frac{\exp(\alpha+\beta_1 x_1+\cdots+\beta_k x_k)}{1+\exp(\alpha+\beta_1 x_1+\cdots+\beta_k x_k)}$

Baseline-category logit model: $\log[P(Y=j)/P(Y=J)] = \alpha_j + \beta_j x$

$$P(Y=j) = \frac{e^{\alpha_j+\beta_j x}}{1+e^{\alpha_1+\beta_1 x}+...+e^{\alpha_{J-1}+\beta_{J-1}x}},\ j=1,2,...,J-1.$$

Cumulative logit model: $\text{logit}\ [P(Y \le j)] = \alpha_j + \beta x$

$$P(Y \le j) = \exp(\alpha_j+\beta x)/[1+\exp(\alpha_j+\beta x)],\ j=1,2,...,J-1.$$

$z = (n_{12} - n_{21})/\sqrt{n_{12}+n_{21}}$ (McNemar)

SE for diff of matched proportions: $\dfrac{\sqrt{(n_{12}+n_{21})-(n_{12}-n_{21})^2/n}}{n}$

Kappa : $\kappa = \dfrac{\sum_i \pi_{ii} - \sum_i \pi_{i+}\pi_{+i}}{1-\sum_i \pi_{i+}\pi_{+i}}$

Independence loglinear model : $\log\mu_{ij} = \lambda + \lambda_i^X + \lambda_j^Y$

$(XY, XZ, YZ)$ : $\log\mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ij}^{XY} + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ}$

$(XZ, YZ)$ : $\log\mu_{ijk} = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_k^Z + \lambda_{ik}^{XZ} + \lambda_{jk}^{YZ}$