We can characterize (2) as saying: Let $\hat{\pi}$ be the linear estimate of minimum variance of π, which is a linear combination of $\pi_1, \cdots, \pi_k$, and let $\hat{v}(\pi)$ be the estimate of the variance of $\hat{\pi}$ based on s^2. Then the confidence interval statements

$$\hat{\pi} - [kF_\alpha \hat{v}(\pi)]^{1/2} \leqq \pi \leqq \hat{\pi} + [kF_\alpha \hat{v}(\pi)]^{1/2},$$

simultaneously for all π, are correct with probability $1 - \alpha$. This result is contained in [1] and [2].

The quantity $D^2 = \sum \pi_i^2$ is a conventional measure of the "distance" of the null hypothesis that $\pi_1 = \cdots = \pi_k = 0$ from the true state of nature. The power of the analysis of variance test depends only on D^2/σ^2. Hence it would be useful for the experimenter to obtain some information about D.

Making use of the triangle inequality, it follows from (1) that

$$1 - \alpha \leqq \Pr\{(\sum \hat{\pi}_i^2)^{1/2} - (kF_\alpha s^2)^{1/2} \leqq D \leqq (\sum \hat{\pi}_i^2)^{1/2} + (kF_\alpha s^2)^{1/2}\}.$$

The quantity $\sum \hat{\pi}_i^2 = Q_1^2$ is what the experimenter calculates as the "sum of squares due to hypothesis." Hence, instead of just making the statements about the functions π, we can make the simultaneous estimates

$$\hat{\pi} - [kF_\alpha \hat{v}(\pi)]^{1/2} \leqq \pi \leqq \hat{\pi} + [kF_\alpha \hat{v}(\pi)]^{1/2}, \qquad \text{for all } \pi = \sum a_i \pi_i,$$

$$Q_1 - (kF_\alpha s^2)^{1/2} \leqq D \leqq Q_1 + (kF_\alpha s^2)^{1/2},$$

with the probability of being correct equal to $1 - \alpha$.

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AN INEQUALITY ON POISSON PROBABILITIES

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This note proves an inequality concerning the exponential series or Poisson distribution, however one prefers to view the matter. Specifically, it will be shown that if $[\lambda]$ is the greatest integer not exceeding λ,

$$\text{1)} \qquad \sum_{j=0}^{[\lambda]} \frac{\lambda^j}{j!} > \begin{cases} e^{\lambda-1} & \text{for all } \lambda \geqq 0; \\ \tfrac{1}{2}e^\lambda & \text{for all integral } \lambda > 0. \end{cases}$$

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