

| | | | | | | | |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 |
| $\frac{4}{3}$ | $\frac{2}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{2}{3}$ | $\frac{1}{3}$ | $\frac{2}{3}$ | $\frac{4}{3}$ |
| $\frac{4}{9}$ | $\frac{2}{9}$ | $\frac{1}{9}$ | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{4}{9}$ |
| $\frac{4}{9}$ | $\frac{2}{9}$ | $\frac{1}{9}$ | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{4}{9}$ |

$\ell:$

$$P(\ell \geq c | H_0) = \alpha$$

$$+ \frac{1}{4} \delta(x_2 - 2) + \dots$$

$$\ell = \frac{L_0}{L_1} = \frac{(\frac{1}{4} \delta(x_1 - 1) + \frac{1}{4} \delta(x_1 - 2) + \dots) \cdot (\frac{1}{4} \delta(x_2 - 1) + \dots)}{(\frac{1}{4} \delta(x_1 - 1) + \frac{1}{4} \delta(x_1 - 2) + \dots) \cdot (\frac{1}{4} \delta(x_2 - 1) + \dots)}$$

$$H_1: \theta = \frac{1}{4}$$

$$H_0: \theta = \frac{1}{2}$$

$$\ell \sim \frac{1}{4} \delta(x - 1) + \frac{1}{4} \delta(x - 2) + 0 \delta(x - 3) + \dots + (\frac{1}{4} - \theta) \delta(x - 4)$$

| | | | |
|--------------------|---------------|---------------|---------------|
| 1 | 2 | 3 | 4 |
| $H_0: \frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{6}$ | $\frac{1}{3}$ |
| $H_1: \frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ |

$$\alpha = 0.2.$$

N.I.

$$= 0.280 \rightarrow \text{not significant} \rightarrow \text{accept } H_0$$

$$= 0.923$$

$$b - 10/16 = 5/8 \quad (V = 1) = \frac{5}{8} \left(1 + \frac{1}{8} \right) = \frac{5}{8} \cdot \frac{9}{8} = \frac{45}{64}$$

$$\text{variance of } \hat{\theta} = \frac{1}{n} \cdot \frac{45}{64} = \frac{45}{512}$$

$\Rightarrow H_0: \theta = 0$ - no linkage disequilibrium

$$= 0.923 = 0.289 \rightarrow \text{not significant}$$

$$\text{step}$$

$$\text{step}$$

$$= 5 \left(\frac{1}{8} \right) \cdot 9 = \frac{45}{8} \left(1 + \frac{1}{8} \right) = \frac{45}{8} \cdot \frac{9}{8} = \frac{405}{64}$$

$$\hat{\theta} = b - 10/16 = 5/8$$

$$W = 1 - \alpha_2 = 0.31$$

$$\alpha_2 = \frac{9}{16} = 0.69$$

$$\alpha_1 = \frac{1}{4} + \frac{3}{8} = 0.19$$

G: (1,3), (2,3), (3,3), (3,2), (3,1).

| | | | | | | | |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| H_0 : | | | | H_1 : | | | |
| 4 | 3 | 2 | 1 | 4 | 3 | 2 | 1 |
| $\frac{21}{1}$ | $\frac{32}{1}$ | $\frac{16}{1}$ | $\frac{6}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ |
| $\frac{21}{1}$ | $\frac{12}{1}$ | $\frac{16}{1}$ | $\frac{6}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ | $\frac{16}{1}$ |
| $\frac{81}{1}$ | $\frac{36}{1}$ | $\frac{12}{1}$ | $\frac{3}{1}$ | $\frac{81}{1}$ | $\frac{36}{1}$ | $\frac{12}{1}$ | $\frac{3}{1}$ |
| $\frac{5}{1}$ | $\frac{18}{1}$ | $\frac{12}{1}$ | $\frac{12}{1}$ | $\frac{5}{1}$ | $\frac{18}{1}$ | $\frac{12}{1}$ | $\frac{12}{1}$ |