

$$\frac{1}{C} \sum^R \sum^N T_{r,s}^2 = \frac{1}{3} \times 3,540 = 1,180.00$$

$$\frac{1}{R} \sum^C \sum^N T_{r,c}^2 = \frac{1}{2} \times 2,544 = 1,272.00$$

$$\sum^R \sum^C \sum^N X_{r,c}^2 = 1,360.00$$

$$\frac{T^2}{RCN} = \frac{1}{36} \times 38,416 = 1,067.11$$

In the above computation the quantity $\sum^R T_{r..}^2 = (117)^2 + (79)^2 = 19,930$; $\sum^C T_{..c}^2 = (34)^2 + (79)^2 + (83)^2 = 14,286$; and so on. Applying the computation formulas of Section 17.8, and remembering that $L = S$, the required sums of squares are as follows:

ROWS

$$\frac{1}{CN} \sum^R T_{r..}^2 - \frac{T^2}{RCN} = 1,107.22 - 1,067.11 = 40.11$$

COLUMNS

$$\frac{1}{RN} \sum^C T_{..c}^2 - \frac{T^2}{RCN} = 1,190.50 - 1,067.11 = 123.39$$

SUBJECTS

$$\frac{1}{RC} \sum^N T_{..s}^2 - \frac{T^2}{RCN} = 1,115.33 - 1,067.11 = 48.22$$

 $R \times C$ INTERACTION

$$\begin{aligned} \frac{1}{N} \sum^R \sum^C T_{rc.}^2 - \frac{1}{CN} \sum^R T_{r..}^2 - \frac{1}{RN} \sum^C T_{..c}^2 + \frac{T^2}{RCN} \\ = 1,242.67 - 1,107.22 - 1,190.50 + 1,067.11 = 12.06 \end{aligned}$$

 $R \times S$ INTERACTION

$$\begin{aligned} \frac{1}{C} \sum^R \sum^N T_{r,s}^2 - \frac{1}{CN} \sum^R T_{r..}^2 - \frac{1}{RC} \sum^N T_{..s}^2 + \frac{T^2}{RCN} \\ = 1,180.00 - 1,107.22 - 1,115.33 + 1,067.11 = 24.56 \end{aligned}$$

 $C \times S$ INTERACTION

$$\begin{aligned} \frac{1}{R} \sum^C \sum^N T_{r,c}^2 - \frac{1}{SR} \sum^C T_{..c}^2 - \frac{1}{RC} \sum^N T_{..s}^2 + \frac{T^2}{RCN} \\ = 1,272.00 - 1,190.50 - 1,115.33 + 1,067.11 = 33.28 \end{aligned}$$