TABLE 8.14-3 Partitioning of Error Terms for Tests of Homogeneity

$$SS_{subj\ w.group\ a_1} = \sum_1^n \frac{\left(\sum_1^q\sum_1^r AS_{1jkm}\right)^2}{qr} - \frac{\left(\sum_1^q A_{1j}\right)^2}{nqr}$$

$$df = n - 1$$

$$SS_{B\times subj\ w.group\ a_1} = \sum_1^q\sum_1^n \frac{(ABS_{1jm})^2}{r} - \sum_1^q \frac{(AB_{1j})^2}{nr} - \sum_1^n \frac{\left(\sum_1^q\sum_1^r AS_{1jkm}\right)^2}{qr} + \frac{\left(\sum_1^q A_{1j}\right)^2}{nqr}$$

$$df = (n - 1)(q - 1)$$

$$SS_{C\times subj\ w.group\ a_1} = \sum_1^r\sum_1^n \frac{(ACS_{1km})^2}{q} - \sum_1^r \frac{(AC_{1k})^2}{nq} - \sum_1^n \frac{\left(\sum_1^q\sum_1^r AS_{1jkm}\right)^2}{qr} + \frac{\left(\sum_1^q A_{1j}\right)^2}{nqr}$$

$$df = (n - 1)(r - 1)$$

$$SS_{BC\times subj\ w.group\ a_1} = \sum_1^q\sum_1^r\sum_1^n ABCS^2_{1jkm} - \sum_1^q\sum_1^r \frac{(ABC_{1jk})^2}{n} - \sum_1^q\sum_1^n \frac{(ABS_{1jm})^2}{r} - \sum_1^r\sum_1^n \frac{(ACS_{1km})^2}{q}$$

$$+ \sum_1^q \frac{(AB_{1j})^2}{nr} + \sum_1^r \frac{(AC_{1k})^2}{nq} + \sum_1^n \frac{\left(\sum_1^q\sum_1^r AS_{1jkm}\right)^2}{qr} - \frac{\left(\sum_1^q A_{1j}\right)^2}{nqr}$$

$$df = (n - 1)(q - 1)(r - 1)$$

TABLE 8.14-4 Conservative *F* Ratio Degrees of Freedom

Numerator of F ratio	df
MS_B	$1, p(n-1)$
MS_{AB}	$(p-1), p(n-1)$
MS_C	$1, p(n-1)$
MS_{AC}	$p-1, p(n-1)$
MS_{BC}	$1, p(n-1)$
MS_{ABC}	$p-1, p(n-1)$

interaction is significant, the experimenter might want to test the significance of simple-simple main effects and simple interaction effects. These tests are outlined in Table 8.14-5. The formulas are given for the first level of each treatment only. The formulas at other levels of the treatments follow the pattern given for the first level. The error terms appearing in Table 8.14-5 for each test are appropriate for a mixed model.

The rationale underlying the selection of a denominator for *F* ratios is presented in Section 8.6. The reader should be certain that he understands the principles on which the determination of the correct error terms is based. The terms given in the table are only correct for the mixed model in which *A*, *B*, and *C* are fixed effects and subjects are random effects. No difficulty should be encountered in determining the error term for other models if one remembers that