$$F_{max} = \left[\frac{\text{largest MS}}{\text{smallest MS}}\right] \text{with } \nu_1 \text{ and } \nu_2 \text{ degrees of freedom.}$$

Six variance-covariance matrices are associated with a type SPF-2.22 design—$q \times q$ at a_1, $q \times q$ at a_2, $r \times r$ at a_1, $r \times r$ at a_2, $qr \times qr$ at a_1, and $qr \times qr$ at a_2. In order for each of the within-subjects F ratios to be distributed as the F distribution, all variances for a particular population dispersion matrix should be equal to σ^2 and all covariances equal to $\rho\sigma^2$ Section 8.5 described procedures for determining the tenability of the hypotheses that, for example, (1) the $q \times q$ population matrix at level a_1 is equal to the $q \times q$ matrix at a_2 and (2) the pooled dispersion matrix

MS	F	E(MS) *A, B, and C Fixed Effects, Subjects Random*
3.125	$[\frac{2}{3}] =$ 2.00	$\sigma_\varepsilon^2 + qr\sigma_\pi^2 + nqr\sigma_\alpha^2$
1.562		$\sigma_\varepsilon^2 + qr\sigma_\pi^2$
162.000	$[\frac{5}{7}] =$ 199.51**	$\sigma_\varepsilon^2 + r\sigma_{\beta\pi}^2 + npr\sigma_\beta^2$
6.125	$[\frac{6}{7}] =$ 7.54*	$\sigma_\varepsilon^2 + r\sigma_{\beta\pi}^2 + nr\sigma_{\alpha\beta}^2$
.812		$\sigma_\varepsilon^2 + r\sigma_{\beta\pi}^2$
24.500	$[\frac{8}{10}] =$ 61.87**	$\sigma_\varepsilon^2 + q\sigma_{\gamma\pi}^2 + npq\sigma_\gamma^2$
10.125	$[\frac{9}{10}] =$ 25.57**	$\sigma_\varepsilon^2 + q\sigma_{\gamma\pi}^2 + nq\sigma_{\alpha\gamma}^2$
.396		$\sigma_\varepsilon^2 + q\sigma_{\gamma\pi}^2$
8.000	$[\frac{11}{13}] =$ 25.64**	$\sigma_\varepsilon^2 + \sigma_{\beta\gamma\pi}^2 + np\sigma_{\beta\gamma}^2$
3.125	$[\frac{12}{13}] =$ 10.02*	$\sigma_\varepsilon^2 + \sigma_{\beta\gamma\pi}^2 + n\sigma_{\alpha\beta\gamma}^2$
.312		$\sigma_\varepsilon^2 + \sigma_{\beta\gamma\pi}^2$

for the two levels of A has the symmetry described above. Identical tests can be performed for the $r \times r$ dispersion matrices and $qr \times qr$ dispersion matrices. If the assumptions of equality and symmetry of the variance-covariance matrices are not tenable, conservative F tests as presented in Table 8.14-4 can be computed. It will be recalled from Section 8.5 that a conservative F test is computed in the usual way but that the F table is entered with modified degrees of freedom.

TESTS OF SIMPLE EFFECTS

It is apparent from Table 8.14-2 that treatments B and C, as well as the AB, AC, BC, and ABC interactions, are significant. Because the triple