As an indication of how much each response variable contributes to the canonical variate, these correlations aid in the interpretation of the canonical variables.

For the dental calculus data, a discriminant analysis for the effect TR is requested by specifying

```
PRINT=DISCRIM(RAW,STAN,ESTIM,COR)/
```

The resulting output is given in Figure 1.35.

Figure 1.35

```
RAW DISCRIMINANT FUNCTION COEFFICIENTS

          FUNCTION NO.
VARIABLE                1

RCAN                .02507
RLI                -.14814
RCI                -.40728

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

          FUNCTION NO.

VARIABLE                1

RCAN                .02944
RLI                -.23973
RCI                -.83862

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ESTIMATES OF EFFECTS FOR CANONICAL VARIABLES

          CANONICAL VARIABLE

 PARAMETER              1

         3          -.60303
         4          -.67469
         5           .18246
         6          -.08566

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CORRELATIONS BETWEEN DEPENDENT AND CANONICAL VARIABLES

          CANONICAL VARIABLE

VARIABLE                1

RCAN               -.38019
RLI                -.77143
RCI                -.98526
```

Discriminant analysis results are reported only for those functions (or corresponding canonical correlations; see Section 1.32) that are significant at level α. The default value of α is 0.15. In Figure 1.32a, the dimension reduction analysis for the TR effect indicates that only the first canonical correlation is significant (the observed significance level is 0.045); hence only one discriminant function is reported in the output displayed above. The value of α can be set by specifying a number between 0 and 1, in parentheses, after the keyword ALPHA. Thus,

```
PRINT=DISCRIM(RAW,COR,ALPHA(0.5))/
```

produces discriminant function coefficients and the correlations between response variables and canonical variables that correspond to discriminant functions with significance levels less than 0.5. If $\alpha = 1.0$ is specified, MANOVA reports all the discriminant functions.

The correlations between the response variables and the canonical variables can be rotated by adding the ROTATE keyword to the PRINT subcommand. (The types of rotation available are described in 1.34.) For example,

```
PRINT=DISCRIM(COR,ROTATE(VARIMAX),ALPHA(1.0))/
```

produces the correlations between the response variables and all the canonical variables and rotates the canonical variables (using the varimax method).

1.36 Box's M Test

The assumption of homogeneous within-cells variance-covariance matrices can be assessed by Box's M test, a multivariate analog of Bartlett's test. If

```
PRINT=HOMOGENEITY(BOXM)/
```

is specified, MANOVA will print Box's M statistic and an approximate *F* statistic with its p- value. The results of Box's M test for the dental calculus data are given in Figure 1.36.