

Excerpt from Applied Multivariate Statistics for the Social Sciences (Stevens, 2002)

Google Book Search

## Applied Multivariate Statistics for the Social Sciences By James Stevens



with respect to power, a platykurtic distribution (a flattened distribution relative to the normal distribution) does attenuate power.

### 6.6 MULTIVARIATE NORMALITY

The **multivariate normality** assumption is a much more stringent assumption than the corresponding assumption of **normality** on a single variable in ANOVA. Although it is difficult to completely characterize **multivariate normality**, *normality on each of the variables separately is a necessary, but not sufficient, condition for multivariate normality to hold.* That is, each of the individual variables must be normally distributed for the variables to follow a **multivariate** normal distribution. Two other properties of a **multivariate** normal distribution are: (a) any linear combination of the variables are normally distributed, and (b) all subsets of the set of variables have **multivariate** normal distributions. This latter property implies, among other things, that all pairs of variables must be bivariate normal. **Bivariate normality**, for correlated variables, implies that the scatterplots for each pair of variables will be elliptical; the higher the correlation, the thinner the ellipse. Thus, as a partial check on **multivariate normality**, one could obtain the scatterplots for pairs of variables from SPSS or SAS and see if they are approximately elliptical.