Two-way MANCOVA: An application to public health

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ABSTRACT
The aim of this work is to use the MANCOVA model to study the influence of the phenotype of an enzyme - Acid phosphatase - and a genetic factor - Haptoglobin genotype - on two dependent variables - Activity of Acid Phosphatase (ACP1) and the Body Mass Index (BMI). Therefore it's used a general linear model, namely a multivariate analysis of covariance (Two-way MANCOVA). The covariate is the age of the subject. This covariate works as control variable for the independent factors, serving to reduce the error term in the model. The main results showed that only the ACP1 phenotype has a significant effect on the activity of ACP1 and the covariate has a significant effect in both dependent variables. The univariate analysis showed that ACP1 phenotype accounts for about 12.5% of the variability in the activity of ACP1. In respect to this covariate it can be seen that accounts for about 4.6% of the variability in the activity of ACP1 and 37.3% in the BMI.

Keywords: biochemistry, covariance analysis, enzymes, genetics, molecular biophysics