# Psych 6136: Models for Ordinal Factors

## Mental health and SES

This exercise examines the fitting of various glm() models for the Mental data treating the factors as ordered variables in the model. As you can see, ses and mental have been created as ordered factors in the data frame.

> data(Mental, package="vcdExtra")

> str(Mental)

'data.frame': 24 obs. of 3 variables:

$ ses : Ord.factor w/ 6 levels "1"<"2"<"3"<"4"<..: 1 1 1 1 2 2 2 2 3 3 ...

$ mental: Ord.factor w/ 4 levels "Well"<"Mild"<..: 1 2 3 4 1 2 3 4 1 2 ...

$ Freq : int 64 94 58 46 57 94 54 40 57 105 ...

It may be helpful to print this as a table:

(Mental.tab <- xtabs(Freq ~ mental + ses, data=Mental))

1. For a quick view of the associations here, carry out a correspondence analysis on the table. What do you see?

mental.ca <- ca(Mental.tab)

plot(mental.ca, lines=TRUE)

1. Begin by fitting the independence model. Note: this is a Possion model for frequency. Examine the goodness of fit of the model using car::Anova() and vcdExtra::LRstats().

indep <- glm(Freq ~ mental+ses, family = poisson, data = Mental)

1. Produce a mosaic plot showing the pattern of association that remains from the independence model.
2. Now create integer scores for the ses and mental factors

Mental$Cscore <- as.numeric(Mental$ses)

Mental$Rscore <- as.numeric(Mental$mental)

1. Fit the row effects and column effects models, using the Cscore and the Rscore respectively in the association term. Also, fit the linear x linear model treating both of these as ordinal

roweff <- update(indep, . ~ . + ???)

coleff <- update(indep, . ~ . + ???)

linlin <- update(indep, . ~ . + ???)

1. Compare the three models you have fit using anova() and LRstats(). What do you conclude is the best model so far?
2. Produce a mosaic plot showing the residuals from the linear x linear model.