library(car)
library(MASS)
library(effects)

Womenlf$partic <- factor(Womenlf$partic,
    levels=c("not.work", "parttime", "fulltime"))
mod.polr <- polr(partic ~ log(hincome) + children, data=Womenlf)
summary(mod.polr)

Call:
polr(formula = partic ~ log(hincome) + children, data = Womenlf)

Coefficients:
              Value Std. Error t value
log(hincome) -0.666  0.233   -2.86
childrenpresent -1.948  0.287   -6.80

Intercepts:
                  Value Std. Error t value
not.work|parttime -2.747  0.654   -4.200
parttime|fulltime -1.837  0.640   -2.869

Residual Deviance: 441.12
AIC: 449.12

library(nnet)
mod.multinom <- multinom(partic ~ log(hincome) + children, data=Womenlf)

# weights: 12 (6 variable)
initial value 288.935032
iter 10 value 212.336493
final value 212.316905
converged

pchisq(deviance(mod.polr) - deviance(mod.multinom), df = 6 - 4, lower.tail=FALSE)

[1] 0.0002637
Happiness Data

Data from Agresti (2013), Table 8.5. Subjects between age 18–22 from the General Social Survey. race is white or black. trauma is the number of traumatic events in the last year, between 0 and 5. happy is a factor with levels “very happy”, “pretty happy” and “not too happy”. n = 79.

load(url(loc))
str(aatab85)
summary(h1 <- polr(happy ~ race + trauma, aatab85))

Call:
polr(formula = happy ~ race + trauma, data = aatab85)

Coefficients:

             Value Std. Error t value
raceblack  2.036    0.686   2.97
trauma     0.406    0.183   2.22

Intercepts:

              Value Std. Error t value
very happy|pretty happy  -0.518    0.340  -1.524
pretty happy|not too happy    3.401    0.568   5.987

Residual Deviance: 148.41
AIC: 156.41

Anova(h2 <- update(h1, ~ (.)^2))

Analysis of Deviance Table (Type II tests)

Response: happy

             LR Chisq Df Pr(>Chisq)
race          9.23   1 0.0024
trauma        5.07   1 0.0244
race:trauma    1.05   1 0.3056

plot(effect("race:trauma", h1), grid=TRUE, row=1, col=1, nrow=1, ncol=2, more=TRUE)
plot(effect("race:trauma", h1), style="stacked", colors=grey(c(.3, .5, .8)),
      row=1, col=2, nrow=1, ncol=2, more=FALSE)