Regression 11

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Worksheet 11

```
data("CHFLS", package = "HSAUR2")
library("MASS")
polr.mod <- polr(R_happy ~ R_age + R_income, data = CHFLS)
summary(polr.mod)
```

```
##
## Re-fitting to get Hessian

## Call:
## polr(formula = R_happy ~ R_age + R_income, data = CHFLS)
##
## Coefficients:
##              Value Std. Error t value
## R_age    -0.006279  5.684e-03  -1.105
## R_income  0.000235  8.509e-05   2.762
##
## Intercepts:
##                               Value    Std. Error t value
## Very unhappy|Not too happy    -4.8016   0.3536   -13.5783
## Not too happy|Somewhat happy  -2.0117   0.2420    -8.3140
## Somewhat happy|Very happy      1.4127   0.2372     5.9547
##
## Residual Deviance: 2644.042
## AIC: 2654.042
```

In this model, we consider the odds of being higher than a certain category, as opposed to being lower than a certain cutpoint given age and income. For example, suppose we are interested in very happy, as opposed to somewhat happy. In this case, we take intercept 1.4127, betas stay the same (hence proportional (log)odds). Lets say age == 30, income == 500. log(OR) = 1.4127 -0.006279*30 + 500*0.000235 = 1.34 means: logs odds of being very happy as opposed to happy are 13/10. == odds are 3.82, being very happy is therefore pretty likely.

General Interpretation: In all these cases, the odds of being in a higher category multiply by exp(-0.006279) for every increase in age and by exp(0.000235) for 1 increase in income - on average.