orderedDV

```
#library(devtools)
#devtools::install_github("rstudio/rmarkdown")
```

```
library(foreign)
setwd("C://Users/Administrator/Desktop/733MLE/pp2/data")
data <- read.dta("repdata.dta")
```

model 1

```
library(MASS)
md1 <- polr(factor(HRabuse)~femalerulerlag+wipDec04lag+femrulerwipDec04lag+polity2modlag+lnpcgnplag,data
summary(md1)
```

```
## Call:
## polr(formula = factor(HRabuse) ~ femalerulerlag + wipDec04lag +
##     femrulerwipDec04lag + polity2modlag + lnpcgnplag, data = data,
##     Hess = T)
##
## Coefficients:
##                          Value Std. Error t value
## femalerulerlag        1.332893   0.365531   3.646
## wipDec04lag          -0.006321   0.004677  -1.352
## femrulerwipDec04lag -0.027176   0.026378  -1.030
## polity2modlag        -0.082755   0.006096 -13.575
## lnpcgnplag           -0.559708   0.033038 -16.942
##
## Intercepts:
##     Value    Std. Error t value
## 0|1  -5.0396   0.2452   -20.5492
## 1|2  -3.4384   0.2329   -14.7606
## 2|3  -1.9280   0.2296    -8.3969
## 3|4  -0.6510   0.2385    -2.7301
##
## Residual Deviance: 6205.831
## AIC: 6223.831
## (922 observations deleted due to missingness)
```

```
#pval <- 2*pt(-abs(t),df=n-1)
t <- coef(summary(md1))[,'t value']
m1p <- pnorm(abs(t),lower.tail=F)*2

library(stargazer)
```

```
##
## Please cite as:
##  Hlavac, Marek (2015). stargazer: Well-Formatted Regression and Summary Statistics Tables.
##  R package version 5.2. http://CRAN.R-project.org/package=stargazer
```

R square

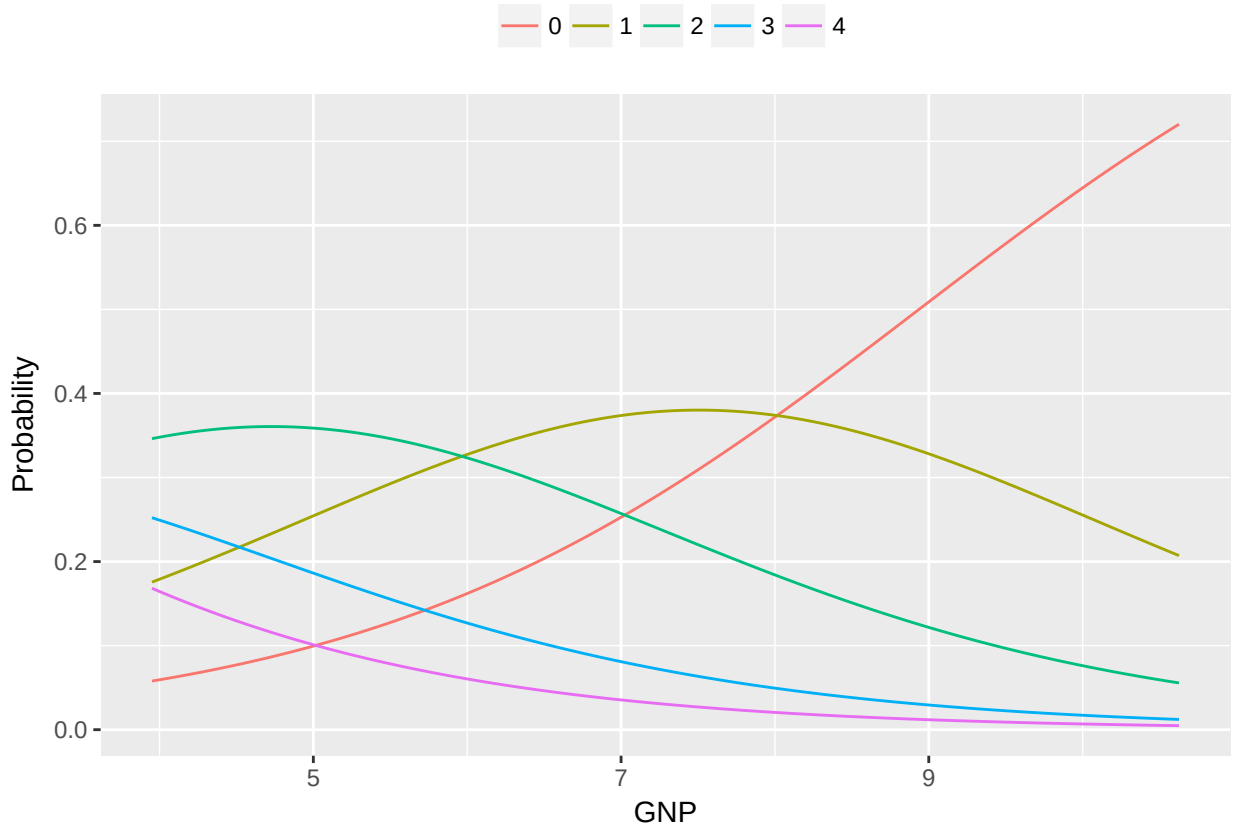
```
library(pscl)
```

```
## Warning: package 'pscl' was built under R version 3.3.3
## Loading required package: lattice
## Classes and Methods for R developed in the
## Political Science Computational Laboratory
## Department of Political Science
## Stanford University
## Simon Jackman
## hurdle and zeroinfl functions by Achim Zeileis
```

```
Rsquare <- pR2(md1)
```

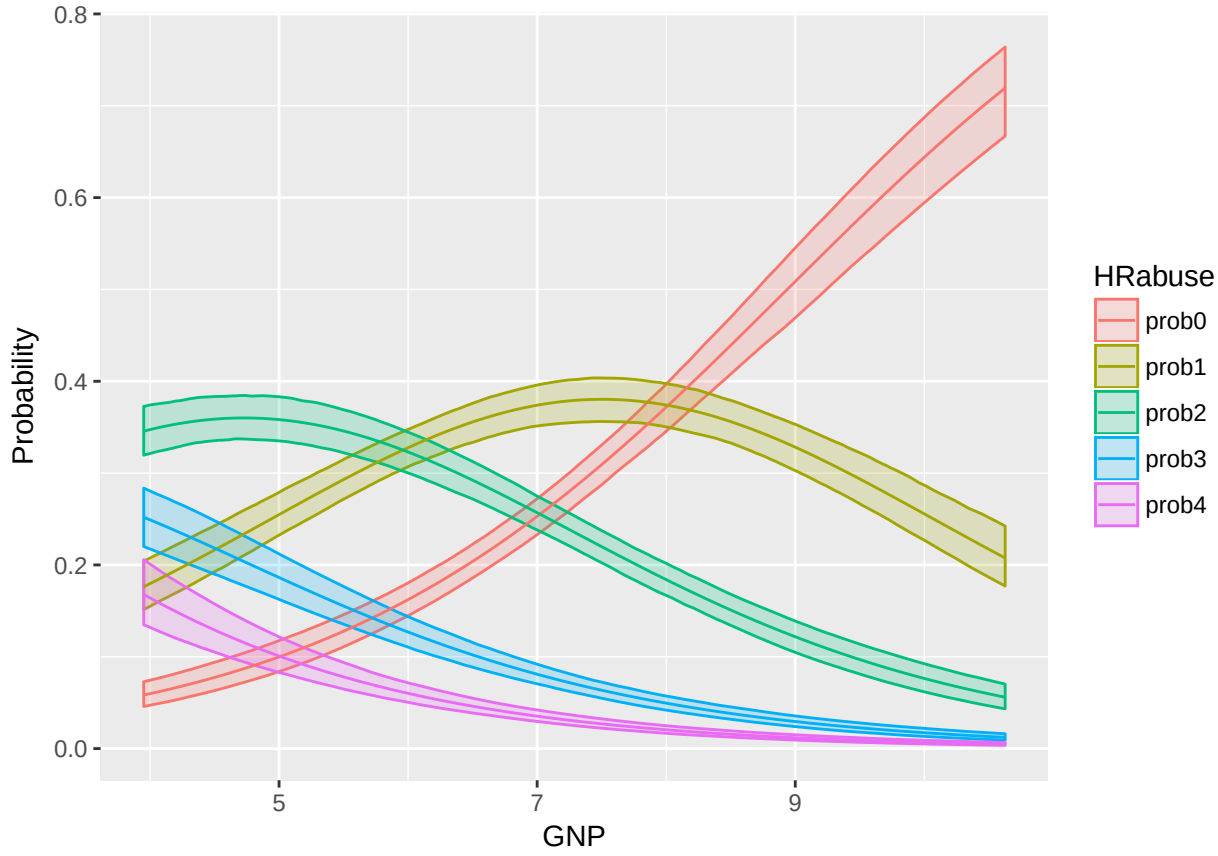
GNP

```
library(ggplot2)
library(reshape)

lnpcgnplag =seq(from=min(data$lnpcgnplag,na.rm=T),to=max(data$lnpcgnplag,na.rm = T),length.out=500)

preddataGNP <- data.frame(femalerulerlag = rep(0,500),
  wipDec04lag = rep(mean(data$wipDec04lag,na.rm = T),500),
  femrulerwipDec04lag= rep(mean(data$femrulerwipDec04lag,na.rm=T),500),
  polity2modlag = rep(mean(data$polity2modlag,na.rm = T),500),lnpcgnplag)

predGNP <- predict(md1,newdata = preddataGNP,type = 'probs',se.fit=T)

GNPdata <- melt(as.data.frame(cbind(predGNP,lnpcgnplag)),id= 'lnpcgnplag')

ggpredGNP <- ggplot(GNPdata, aes(x=lnpcgnplag, y=value, color=variable)) + geom_line() + xlab('GNP') + y
ggpredGNP
```




```
#add uncertainty
ivs <- c("femalerulerlag", "wipDec04lag", "femrulerwipDec04lag", "polity2modlag","lnpcgnplag")
beta <- coef(md1)
tau <- md1$zeta

X1 <- preddataGNP
draws <- mvrnorm(1000, c(beta, tau), vcov(md1))

betaDraws <- draws[, 1:length(ivs) ]
tauDraws <- draws[, (length(ivs) + 1):ncol(draws) ]
preds1 <- betaDraws %*% t(X1)

# predicted probabilities for different levels of DV 0-4
GNPprob0 <- plogis(tauDraws[,1] - preds1)
GNPprob1 <- plogis(tauDraws[,2] - preds1) - plogis(tauDraws[,1] - preds1)
GNPprob2 <- plogis(tauDraws[,3] - preds1) - plogis(tauDraws[,2] - preds1)
GNPprob3 <- plogis(tauDraws[,4] - preds1)-  plogis(tauDraws[,3] - preds1)
GNPprob4 <- 1-plogis(tauDraws[,4] - preds1)
# confidence interval
fconfint<- function(x){ c( mean(x), quantile(x, probs=c(0.025, 0.975)) ) }
GNPprob0Summ <- t(apply(GNPprob0,2,fconfint))
GNPprob1Summ <- t(apply(GNPprob1,2,fconfint))
GNPprob2Summ <- t(apply(GNPprob2,2,fconfint))
GNPprob3Summ <- t(apply(GNPprob3,2,fconfint))
GNPprob4Summ <- t(apply(GNPprob4,2,fconfint))
```

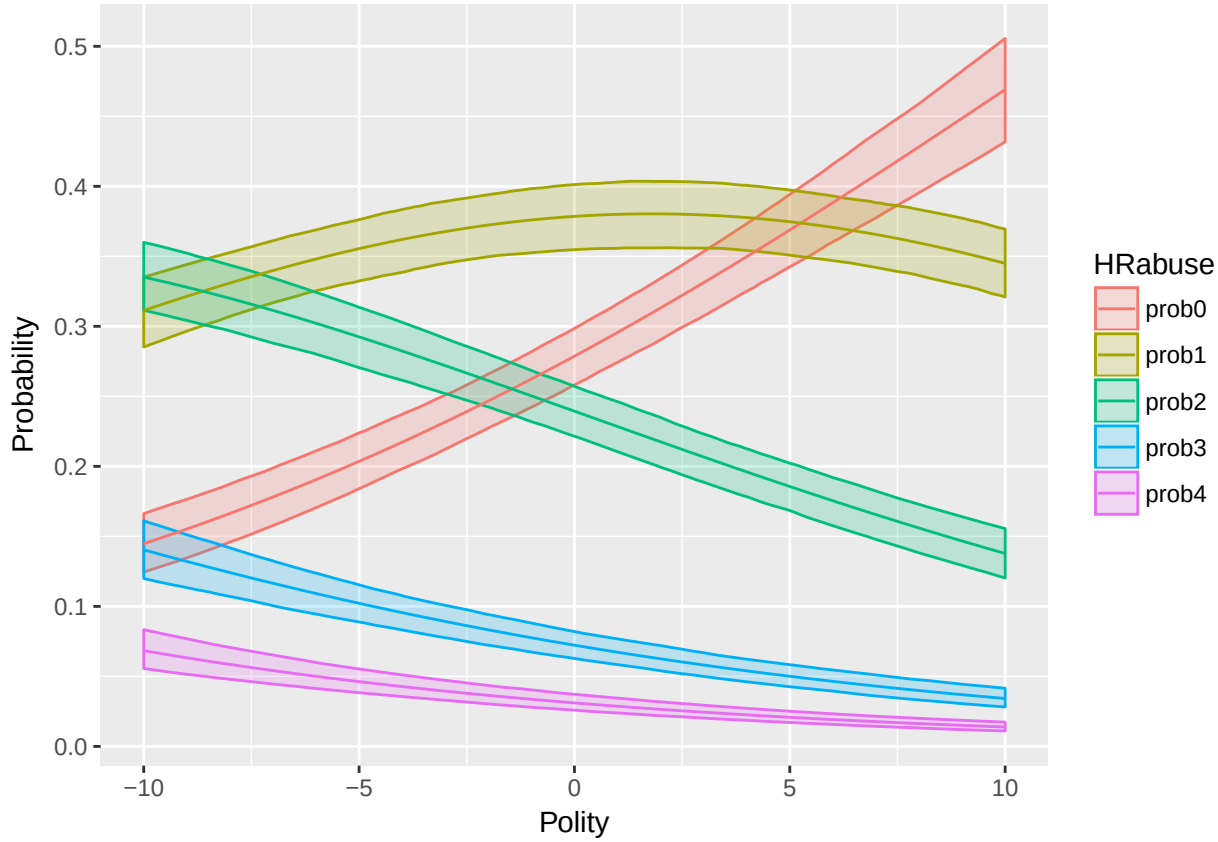
```
GNPuncertainty <- data.frame(rbind(cbind(lnpcgnplag, GNPprob0Summ), cbind(lnpcgnplag, GNPprob1Summ), cb

colnames(GNPuncertainty) <-c('GNP', 'mu', 'lo', 'hi')

GNPuncertainty$HRabuse <- rep( c('prob0', 'prob1', 'prob2', 'prob3','prob4'), each=nrow(X1))

# Plot
plotGNP <- ggplot(GNPuncertainty, aes(x=GNP, y=mu, ymin=lo, ymax=hi, color=HRabuse, fill=HRabuse)) + ge
plotGNP
```



polity

```
polity2modlag =seq(from=min(data$polity2modlag,na.rm=T),to=max(data$polity2modlag,na.rm = T),length.out=

preddataPO <- data.frame(femalerulerlag = rep(0,500),
  wipDec04lag = rep(mean(data$wipDec04lag,na.rm = T),500),
  femrulerwipDec04lag= rep(mean(data$femrulerwipDec04lag,na.rm=T),500),
  polity2modlag,lnpcgnplag = rep(mean(data$lnpcgnplag,na.rm = T),500))

predPO <- predict(md1,newdata = preddataPO,type = 'probs',se.fit=T)

#add uncertainty
X2 <- preddataPO

preds2 <- betaDraws %*% t(X2)
# predicted probabilities for different levels of DV 0-4
POprob0 <- plogis(tauDraws[,1] - preds2)
```

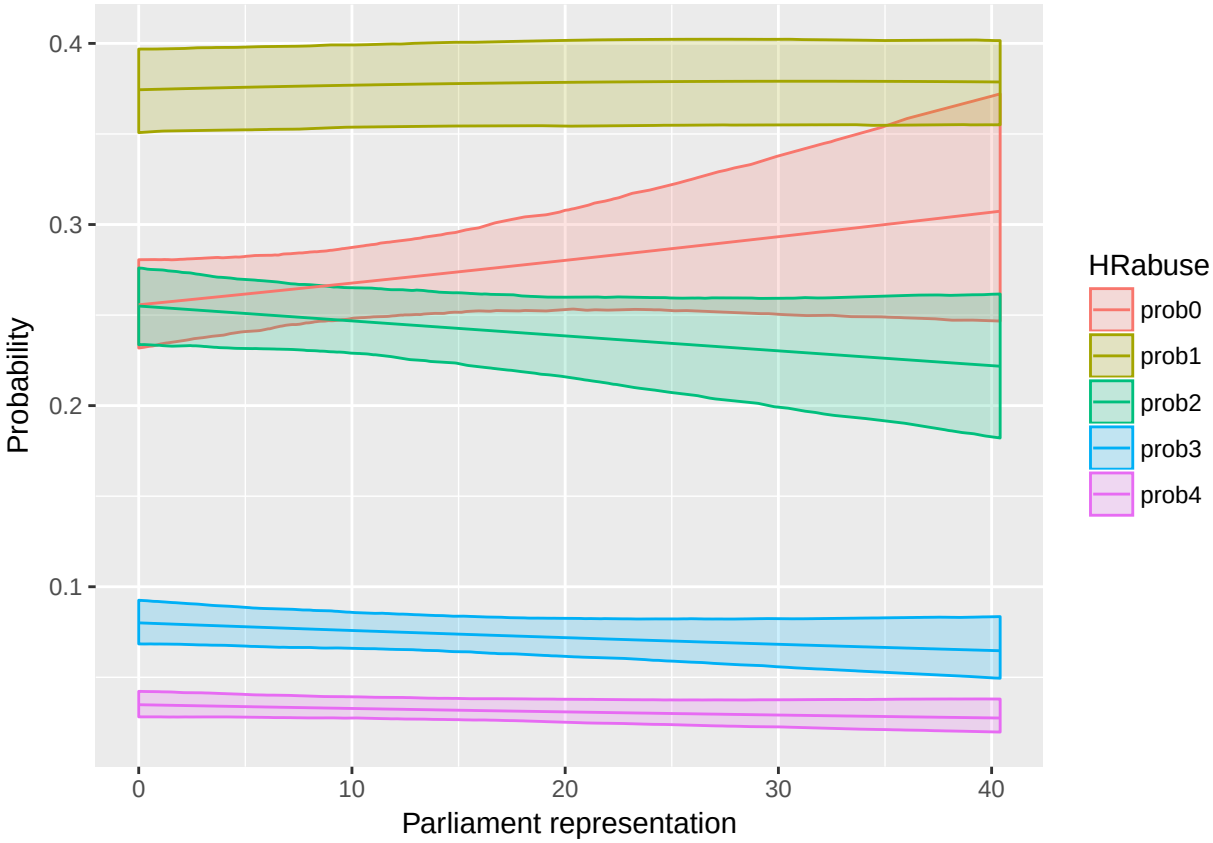
```
POprob1 <- plogis(tauDraws[,2] - preds2) - plogis(tauDraws[,1] - preds2)
POprob2 <- plogis(tauDraws[,3] - preds2) - plogis(tauDraws[,2] - preds2)
POprob3 <- plogis(tauDraws[,4] - preds2)-  plogis(tauDraws[,3] - preds2)
POprob4 <- 1-plogis(tauDraws[,4] - preds2)
# confidence interval

POprob0Summ <- t(apply(POprob0,2,fconfint))
POprob1Summ <- t(apply(POprob1,2,fconfint))
POprob2Summ <- t(apply(POprob2,2,fconfint))
POprob3Summ <- t(apply(POprob3,2,fconfint))
POprob4Summ <- t(apply(POprob4,2,fconfint))

POuncertainty <- data.frame(rbind(cbind(polity2modlag , POprob0Summ), cbind(polity2modlag , POprob1Summ

colnames(POuncertainty) <- c('Polity', 'mu', 'lo', 'hi')

POuncertainty$HRabuse <- rep( c('prob0', 'prob1', 'prob2', 'prob3','prob4'), each=nrow(X2))

# Plot
plotPO <- ggplot(POuncertainty, aes(x=Polity, y=mu, ymin=lo, ymax=hi, color=HRabuse, fill=HRabuse)) + g
plotPO
```



female leader

```
wipDec04lag =seq(from=min(data$wipDec04lag,na.rm=T),to=max(data$wipDec04lag,na.rm = T),length.out=500)

preddataPAR <- data.frame(femalerulerlag=rep(mean(data$femalerulerlag,na.rm=T),500),wipDec04lag,
```

```
  femrulerwipDec04lag=rep(mean(data$femrulerwipDec04lag,na.rm=T),500),
  polity2modlag=rep(mean(data$polity2modlag,na.rm = T),500),lnpcgnplag = rep(mean(data$lnpcgnplag,na.rm

predPAR <- predict(md1,newdata = preddataPAR,type = 'probs',se.fit=T)

#add uncertainty
X3 <- preddataPAR
# get prediction
preds3 <- betaDraws %*% t(X3)
# predicted probabilities for different levels of DV 0-4
PARprob0 <- plogis(tauDraws[,1] - preds3)
PARprob1 <- plogis(tauDraws[,2] - preds3) - plogis(tauDraws[,1] - preds3)
PARprob2 <- plogis(tauDraws[,3] - preds3) - plogis(tauDraws[,2] - preds3)
PARprob3 <- plogis(tauDraws[,4] - preds3)-  plogis(tauDraws[,3] - preds3)
PARprob4 <- 1-plogis(tauDraws[,4] - preds3)
# confidence interval
PARprob0Summ <- t(apply(PARprob0,2,fconfint))
PARprob1Summ <- t(apply(PARprob1,2,fconfint))
PARprob2Summ <- t(apply(PARprob2,2,fconfint))
PARprob3Summ <- t(apply(PARprob3,2,fconfint))
PARprob4Summ <- t(apply(PARprob4,2,fconfint))

PARuncertainty <- data.frame(rbind(cbind(wipDec04lag , PARprob0Summ), cbind(wipDec04lag , PARprob1Summ)

colnames(PARuncertainty) <- c('Parliament', 'mu', 'lo', 'hi')

PARuncertainty$HRabuse <- rep( c('prob0', 'prob1', 'prob2', 'prob3','prob4'), each=nrow(X3))

# Plot
plotPAR <- ggplot(PARuncertainty, aes(x=Parliament, y=mu, ymin=lo, ymax=hi, color=HRabuse, fill=HRabuse)
plotPAR
```


0.4
0.3
0.2
0.1
Probability
0
10
20
30
40
Parliament representation
HRabuse
prob0
prob1
prob2
prob3
prob4