multinominal

load data

```
setwd("C:/Users/Administrator/Desktop/733MLE/pp2/data2")
library(foreign)
data <- read.dta("MAROB ME FOR CONTENTION .dta")
```

model

```
library(effects)
```

```
## Warning: package 'effects' was built under R version 3.3.3
```

```
datause <- data[,c("orgId","orgname","year","country","Contententious","twolagCont","threelagCont","fh_
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 3.3.3
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
datause=datause %>%
  mutate(
    GENDINC=as.factor(GENDINC),
    RELORG=as.factor(RELORG),
    LEFTORG=as.factor(LEFTORG)
  )
datause$GENDINC <- as.numeric(datause$GENDINC)-1 #gender inclusive as 1 and exclusive as 0
datause$RELORG <- as.numeric(datause$RELORG)-1
datause$LEFTORG<-as.numeric(datause$LEFTORG)-1
datause$STATEVIOLENCE<-as.numeric(datause$STATEVIOLENCE)-1
#0 for State is not using lethal violence against the organization
#1 for State is using periodic lethal violence against the organization
#2 for State is using consistent lethal violence against the organization

#DV:0 for traditional political behavior, 1 for participation in protest and public demonstration, 2 fo
require(nnet)
```

```
## Loading required package: nnet
```

```
## Warning: package 'nnet' was built under R version 3.3.3
```

```
md1 = multinom(data = datause, Contententious~twolagCont+threelagCont+fh_ipolity2+GENDINC+RELORG+LEFTOR
```

```
## # weights:  36 (24 variable)
## initial  value 1796.637492
## iter  10 value 1135.423950
## iter  20 value 951.309347
## iter  30 value 932.818361
```

```
## final  value 932.426069
## converged
```

```
summary(md1)
```

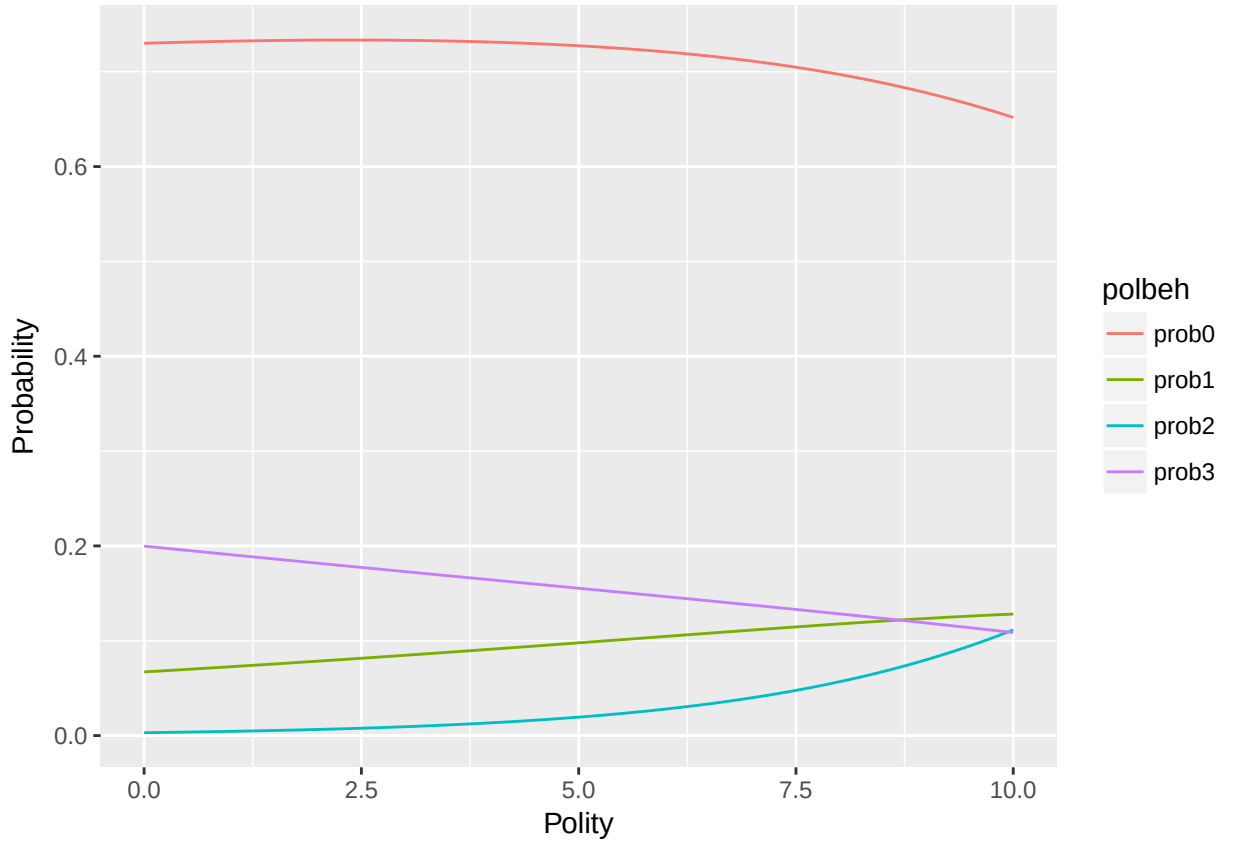
```
## Call:
## multinom(formula = Contententious ~ twolagCont + threelagCont +
##     fh_ipolity2 + GENDINC + RELORG + LEFTORG + STATEVIOLENCE,
##     data = datause)
##
## Coefficients:
##   (Intercept) twolagCont threelagCont fh_ipolity2    GENDINC    RELORG
## 1   -2.714003  0.1090743    0.1817941  0.07599815  0.8980574 0.2917681
## 2   -7.174648  0.8317108    0.6824565  0.37101363 -1.1228761 1.3447062
## 3   -2.718045  0.6437476    0.6233644 -0.04958771 -1.0253820 0.1442492
##       LEFTORG STATEVIOLENCE
## 1  0.01830425     0.6965392
## 2 -0.19581880     3.2269864
## 3  0.38822060     2.2454644
##
## Std. Errors:
##   (Intercept) twolagCont threelagCont fh_ipolity2   GENDINC    RELORG
## 1   0.2557919 0.11257540   0.10805398  0.03029804 0.2315246 0.2814956
## 2   0.5970043 0.16714944   0.16264773  0.05204510 0.5169862 0.3701642
## 3   0.2565933 0.07769186   0.07742285  0.03456508 0.3030033 0.2421399
##     LEFTORG STATEVIOLENCE
## 1 0.2514077     0.4565758
## 2 0.3980479     0.3609821
## 3 0.2313594     0.3149908
##
## Residual Deviance: 1864.852
## AIC: 1912.852
```

```
library(ggplot2)
```

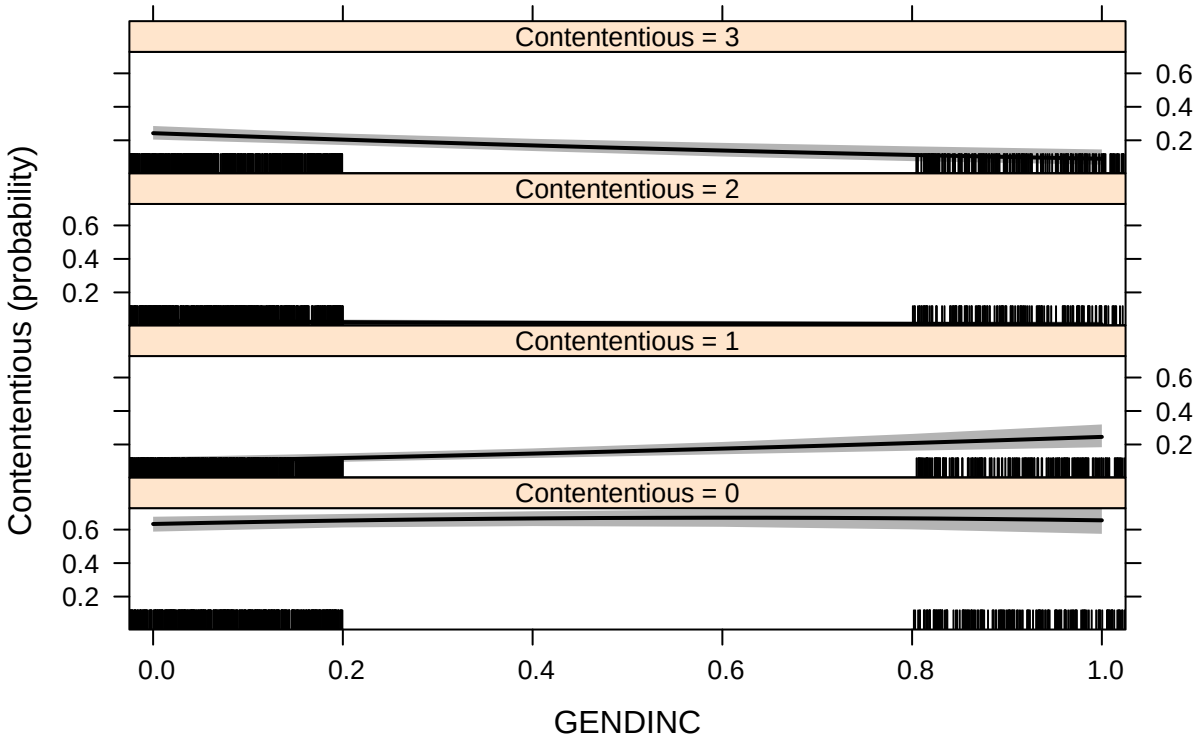
plot polity over org's political behavior

```
fh_ipolity2 =seq(from=min(datause$fh_ipolity2,na.rm=T),to=max(datause$fh_ipolity2,na.rm = T),length.out=

datagen0 <- data.frame(twolagCont = rep(mean(datause$twolagCont,na.rm=T),500),threelagCont = rep(mean(da
  GENDINC = rep(0,500), RELORG = rep(median(datause$RELORG,na.rm = T),500),
  LEFTORG = rep(median(datause$LEFTORG,na.rm = T),500),
  STATEVIOLENCE= rep(median(datause$STATEVIOLENCE,na.rm = T),500))

predgen0 <- as.data.frame(predict(md1,newdata = datagen0,type = 'probs',se.fit=TRUE))

plotgen0 <- cbind(datagen0,predgen0)
plotgen0$caseid <- c(1:500)

colnames(plotgen0)[8] <- "prob.0"
colnames(plotgen0)[9] <- "prob.1"
colnames(plotgen0)[10] <- "prob.2"
colnames(plotgen0)[11] <- "prob.3"
shapeplotgen0 <-reshape(plotgen0, varying = c(8:11), timevar= "prob",idvar = "caseid", direction="long"

shapeplotgen0$polbeh <- rep( c('prob0', 'prob1', 'prob2', 'prob3'), each=500)
```

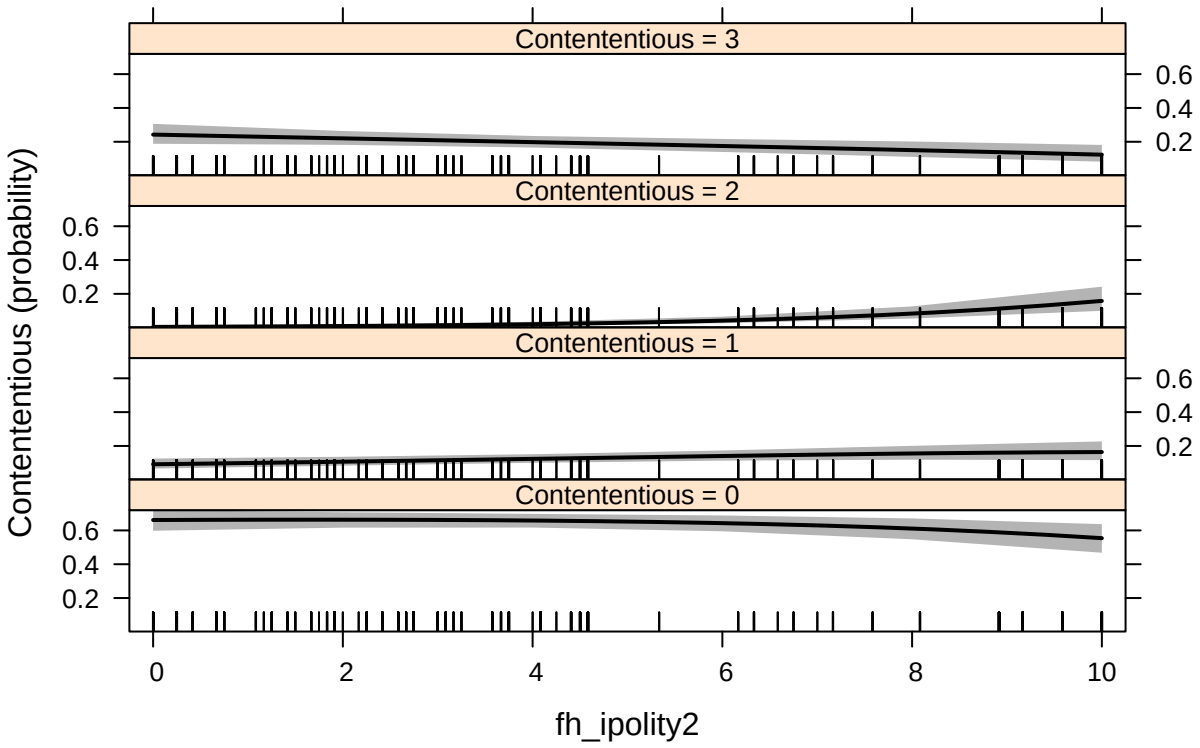
```
genplot0 <- ggplot(shapeplotgen0, aes(x=fh_ipolity2, y=prob,  color=polbeh, fill=polbeh)) +  geom_line()
genplot0
```




```
uncerGEN <-plot(effect("GENDINC",md1))
uncerPO <-plot(effect("fh_ipolity2",md1))
uncerGEN
```

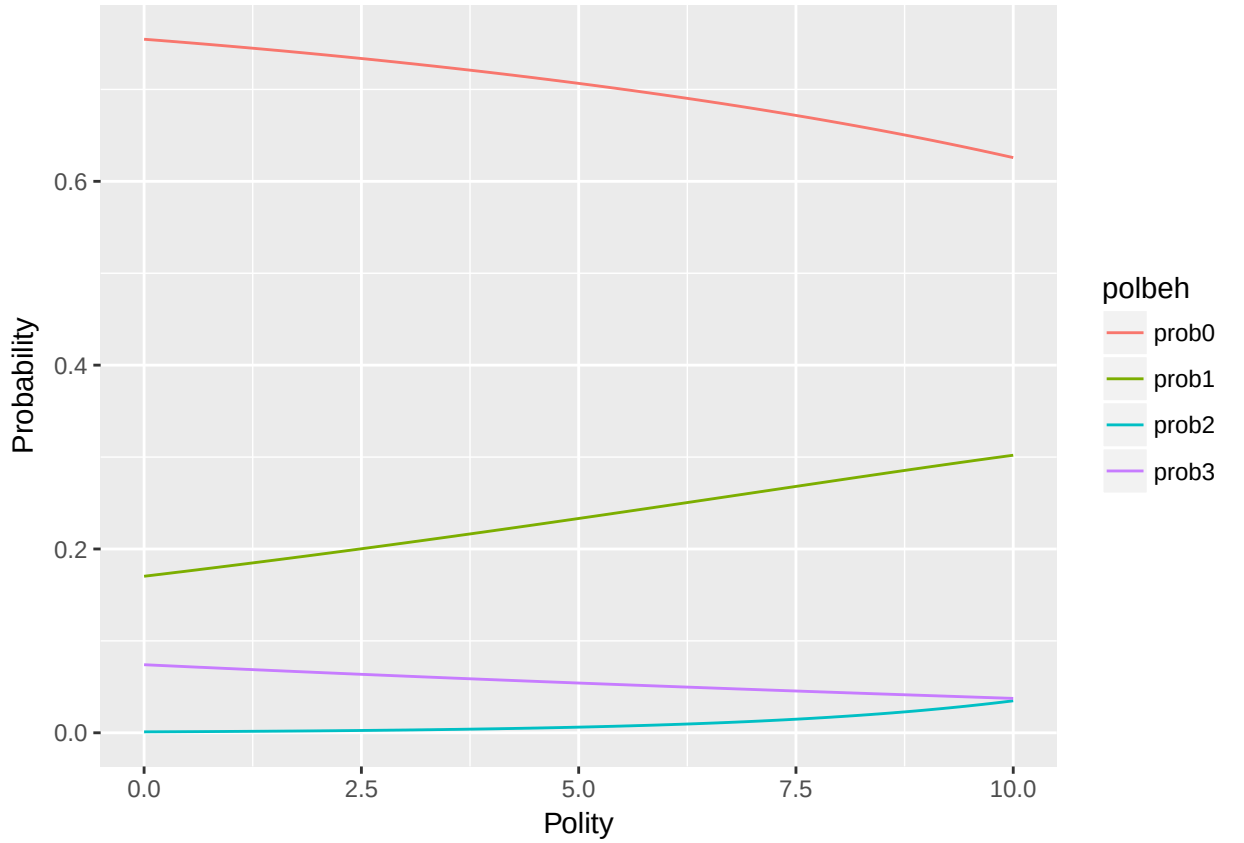

GENDINC effect plot
Contententious = 3
Contententious = 2
Contententious = 1
Contententious = 0
Contententious (probability)
GENDINC
0.0
0.2
0.4
0.6
0.8
1.0

```
uncerPO
```

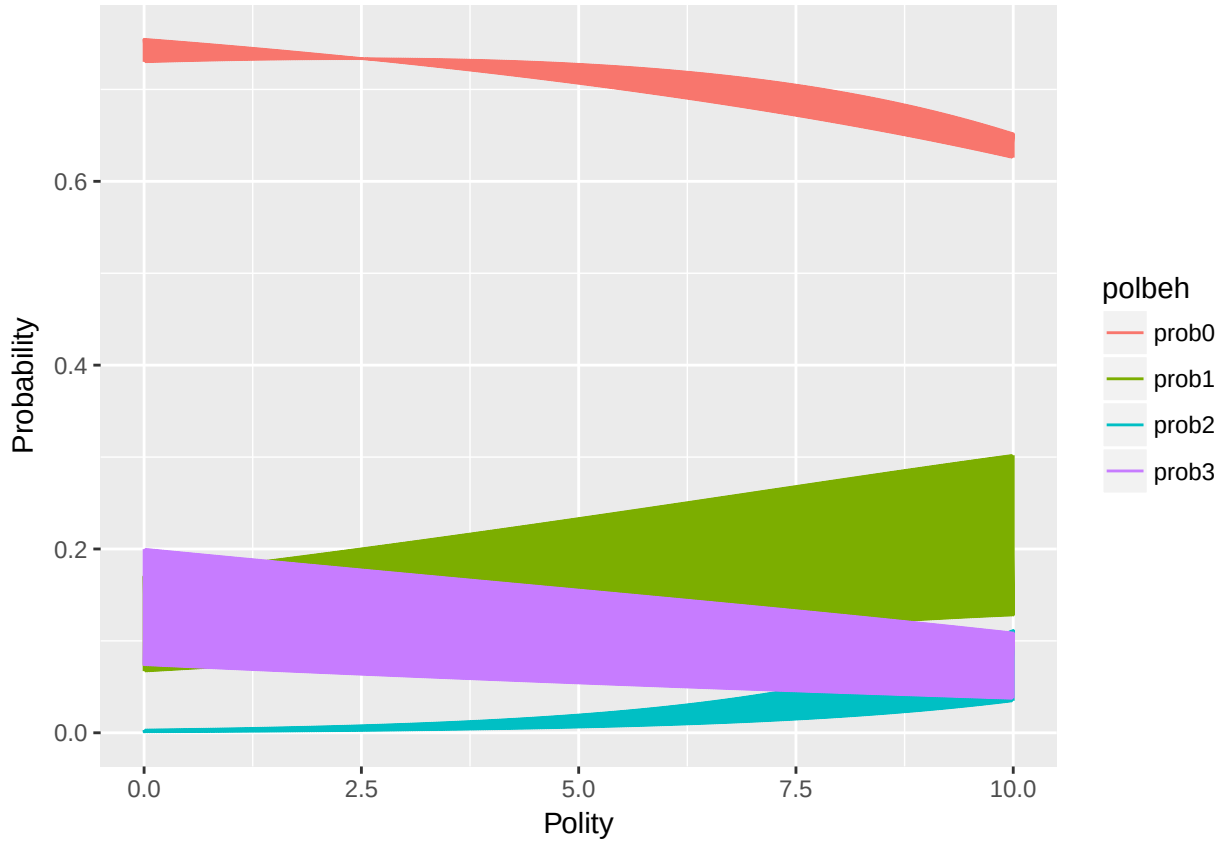


when gender is set at 1

```
datagen1 <- data.frame(twolagCont = rep(mean(datause$twolagCont,na.rm=T),500),threelagCont = rep(mean(da
                       GENDINC = rep(1,500), RELORG = rep(median(datause$RELORG,na.rm = T),500),
                       LEFTORG = rep(median(datause$LEFTORG,na.rm = T),500),
                       STATEVIOLENCE= rep(median(datause$STATEVIOLENCE,na.rm = T),500))

predgen1 <- as.data.frame(predict(md1,newdata = datagen1,type = 'probs',se.fit=T))

plotgen1 <- cbind(datagen1,predgen1)
plotgen1$caseid <- c(1:500)

colnames(plotgen1)[8] <- "prob.0"
colnames(plotgen1)[9] <- "prob.1"
colnames(plotgen1)[10] <- "prob.2"
colnames(plotgen1)[11] <- "prob.3"
shapeplotgen1 <-reshape(plotgen1, varying = c(8:11), timevar= "prob",idvar = "caseid", direction="long"

shapeplotgen1$polbeh <- rep( c('prob0', 'prob1', 'prob2', 'prob3'), each=500)

genplot1 <- ggplot(shapeplotgen1, aes(x=fh_ipolity2, y=prob,  color=polbeh, fill=polbeh)) +  geom_line(
genplot1
```

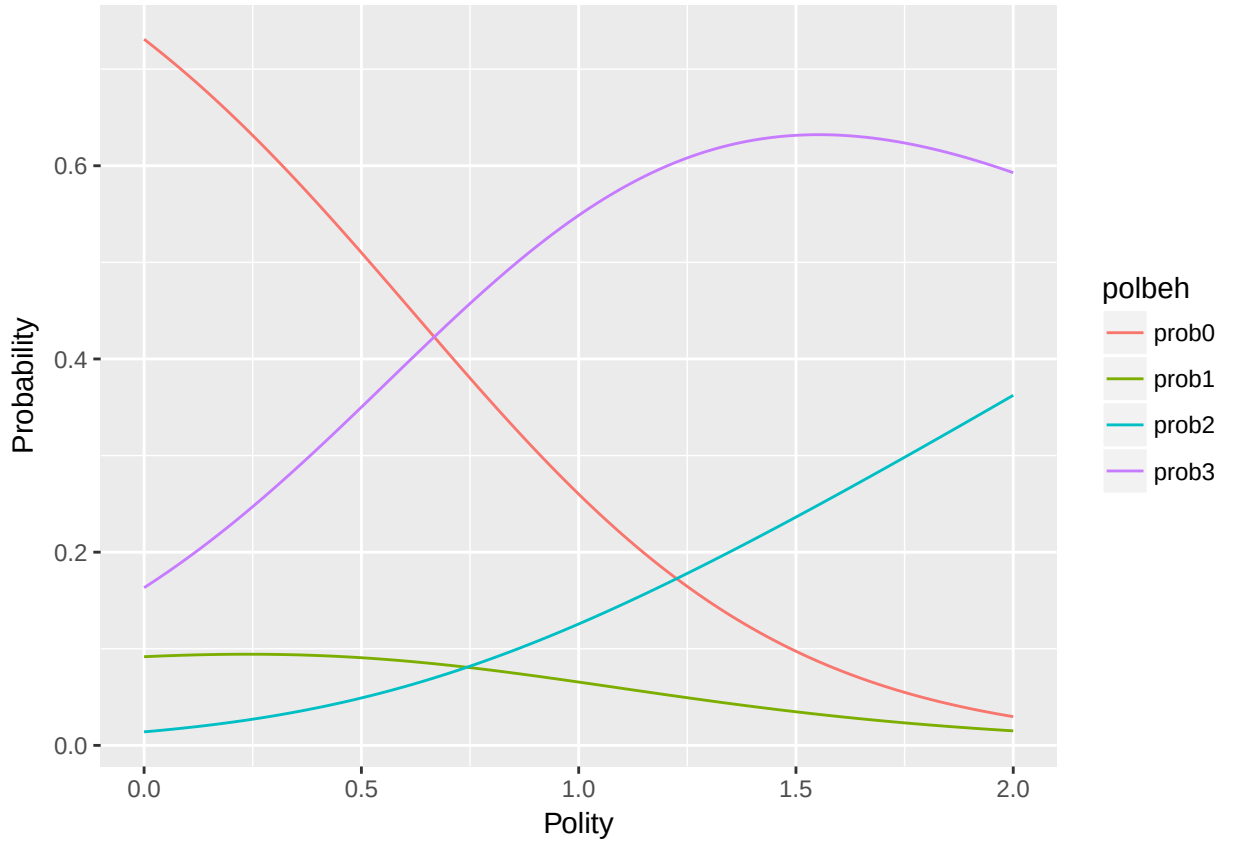



```
shapeplotgen <- rbind(shapeplotgen0,shapeplotgen1)
shapeplotgen$gen <- rep(c("0","1"), each=2000)

genplot <- ggplot(shapeplotgen, aes(x=fh_ipolity2, y=prob,  color=polbeh, fill=polbeh)) +  geom_line() +
genplot
```

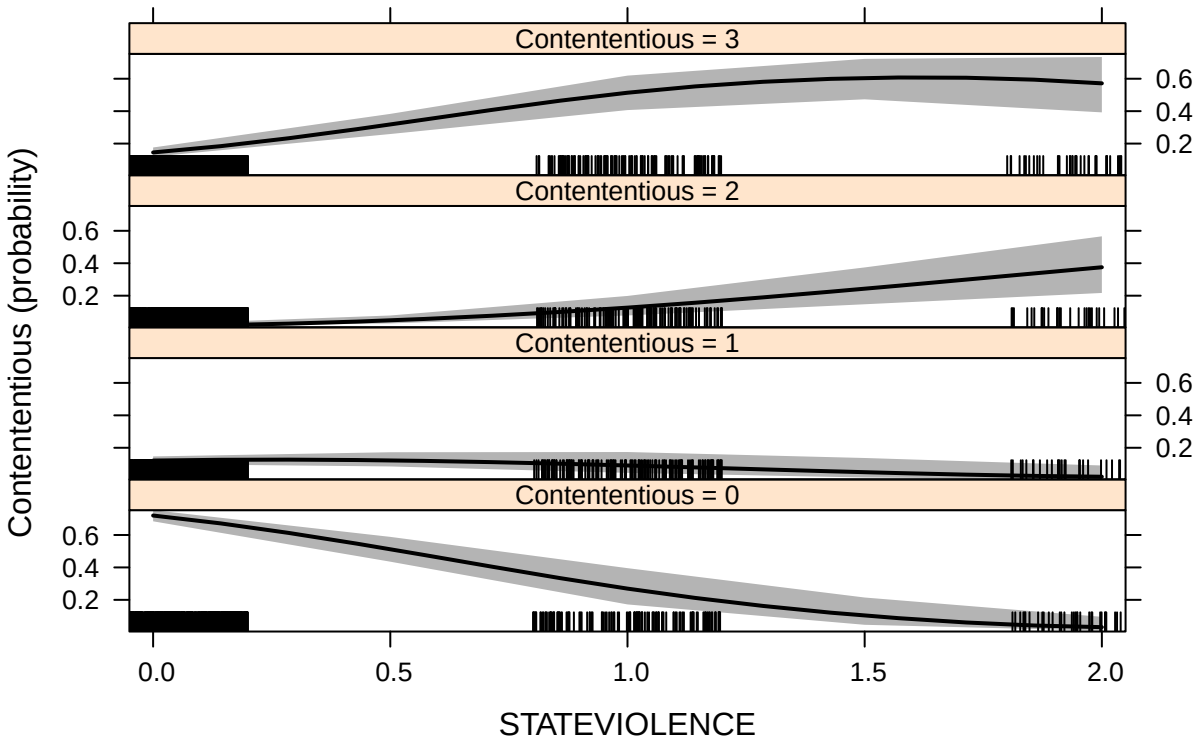


stateviolence

```
svdata <-data.frame(twolagCont=rep(mean(datause$twolagCont,na.rm=T),900),threelagCont =rep(mean(datause$

predsv <- as.data.frame(predict(md1,newdata = svdata,type = 'probs',se=TRUE, interval="confidence", leve

plotsv <- cbind(svdata,predsv)
plotsv$caseid <- c(1:900)

colnames(plotsv)[8] <- "prob.0"
colnames(plotsv)[9] <- "prob.1"
colnames(plotsv)[10] <- "prob.2"
colnames(plotsv)[11] <- "prob.3"
shapeplotsv <-reshape(plotsv, varying = c(8:11), timevar= "prob",idvar = "caseid", direction="long")

shapeplotsv$polbeh <- rep( c('prob0', 'prob1', 'prob2', 'prob3'), each=900)

plotsv <- ggplot(shapeplotsv, aes(x=STATEVIOLENCE, y=prob,  color=polbeh, fill=polbeh)) +  geom_line() +
plotsv
```




```
unsceSV <- plot(effect("STATEVIOLENCE",md1))
unsceSV
```


STATEVIOLENCE effect plot
Contententious = 3
Contententious = 2
Contententious = 1
Contententious = 0
Contententious (probability)
0.2
0.4
0.6
0.0
0.5
1.0
1.5
2.0
STATEVIOLENCE