Short Example

```
library(simstudy)
library(ordinal)

baseprobs<-c(0.40, 0.25, 0.15, 0.20)

def <- defData(varname="male", formula=0.65, dist = "binary")

# define random effect

def <- defData(def, varname = "re", formula = 0, variance = 1, dist = "normal")

# define "shift"

defZ <- defDataAdd(varname = "z", formula = "1*male + re", dist = "nonrandom")

# generate data

set.seed(12345)

dx <- genData(2500, def)
dx <- addPeriods(dx, 3)
dx <- addColumns(defZ, dx)
dx <- genOrdCat(dx, adjVar = "z", baseprobs, catVar = "r")

print(dx)
```

```
##         id period male          re timeID          z r
##    1:    1      0    0  0.89153864      1  0.8915386 4
##    2:    1      1    0  0.89153864      2  0.8915386 2
##    3:    1      2    0  0.89153864      3  0.8915386 4
##    4:    2      0    0  0.70869698      4  0.7086970 1
##    5:    2      1    0  0.70869698      5  0.7086970 4
##   ---
## 7496: 2499      1    1 -1.55007085   7496 -0.5500709 2
## 7497: 2499      2    1 -1.55007085   7497 -0.5500709 1
## 7498: 2500      0    1  0.07022202   7498  1.0702220 1
## 7499: 2500      1    1  0.07022202   7499  1.0702220 1
## 7500: 2500      2    1  0.07022202   7500  1.0702220 4
```

```
## Estiamte correlation

dc <- dcast(dx, id ~ period, value.var = "r")
setnames(dc, c("id", "r1", "r2", "r3"))

cor(dc[, matrix(cbind(r1, r2, r3), ncol = 3)])
```

```
##           [,1]      [,2]      [,3]
## [1,] 1.0000000 0.2714959 0.2622406
## [2,] 0.2714959 1.0000000 0.2446760
## [3,] 0.2622406 0.2446760 1.0000000
```

```r
## Fit mixed-effects model

clm.mixed <- clmm(r ~ male + (1 | id), data = dx)
summary(clm.mixed)
```

```
## Cumulative Link Mixed Model fitted with the Laplace approximation
##
## formula: r ~ male + (1 | id)
## data:    dx
##
##  link  threshold nobs logLik   AIC      niter     max.grad cond.H
##  logit flexible  7500 -9613.23 19236.46 365(1098) 5.55e-04 5.4e+01
##
## Random effects:
##  Groups Name        Variance Std.Dev.
##  id     (Intercept) 0.8457   0.9196
## Number of groups:  id 2500
##
## Coefficients:
##      Estimate Std. Error z value Pr(>|z|)
## male  1.11803    0.06172   18.12   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Threshold coefficients:
##     Estimate Std. Error z value
## 1|2 -0.31759    0.04949  -6.418
## 2|3  0.70856    0.05051  14.027
## 3|4  1.45737    0.05370  27.138
```